THE SADDLE ISLAND CEMETERY:

A STUDY OF WHALERS AT A SIXTEENTH-CENTURY BASQUE WHALING STATION IN RED BAY, LABRADOR

by

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ABSTRACT

This thesis is a study of burial patterning and osteological data for 63 grave features located in the sixteenth-century cemetery on Saddle Island, Red Bay, Labrador. Over 130 individuals were buried on Saddle Island during the Basque whaling enterprise that would see thousands of men pursue whales to collect train oil for European markets for more than 50 years along the south coast of Labrador.

These remains were excavated in the early 1980s and have been largely unstudied until this time. This thesis examines the human skeletal remains, archaeological contexts, and burial artefacts to help reconstruct past biological, cultural, and historical conditions. The study of the human remains and mortuary behavior from Saddle Island provides personal stories of life and death of a sixteenth-century whaler and offers us a rare and unique opportunity to understand the men who sailed annually from the Basque Country to hunt whales to light the streets of Europe.

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"Killing Whales is sometimes attended with bad accidents…"

- Dr. William Dalton, Surgeon aboard the Phoenix of London, 1823-25
(Gunson1990:65)

Chapter 1 Introduction and Objectives of Research

1.1 Introduction

This thesis examines the Basque skeletal material located on Saddle Island in Red Bay, Labrador. The skeletons are the remains of Basque mariners and whalers who sailed from the Bay of Biscay to the Strait of Belle Isle, or "the Grand Bay", during the sixteenth century. The remains were recovered from a cemetery excavated on Saddle Island, in Red Bay harbour, between 1982 and 1986.

Archival research (Barkham 1976, 1977a, 1977b, 1978, 1980a, 1980b, 1982, 1984) and archaeological excavations (Grenier et al. 2007; Tuck 1978, 1981, 1982, 1983, 1984, 1985, 1986, 1987a, 1989a, 2005) at Red Bay, Labrador, established that Basque whalers maintained a large-scale seasonal whaling industry in the Strait of Belle Isle from approximately 1530 to 1630, peaking during the 1540s to 1580s. This archival and archaeological research outlines the operation of the sixteenth-century Basque whaling station in Red Bay. Until now the research has focussed on whaling technology, whaling vessels, architecture, and the material culture of day-to-day life. This thesis will switch focus to the Saddle Island cemetery, specifically using the human skeletal material (bones and teeth) to obtain a greater understanding of the people in order to better understand

who these Basque mariners and whalers were and the circumstances surrounding their death and burial in Red Bay, Labrador.

1.2 Relevance of Research

Red Bay is the site of one of the New World's earliest industrial complexes and today it is often referred to as the World Whaling Capital of the era (Tuck and Grenier 1989:3). It is considered an important archaeological site internationally because it affords a rich glimpse of Canada's past involvement in the whaling industry and the Basque people who brought it here. The Red Bay Basque Whaling Station became a UNESCO World Heritage Site in June 2013 and the results of this research will contribute to a broader understanding of whaling life on the southern Labrador coast during the sixteenth century.

1.3 The Archaeology

In the early 1970s, researchers began to look more closely into the role that Basque fishermen played in early Canadian history. René Bélanger's (1971) review of historical documents on Basques along the St. Lawrence River and Estuary during the sixteenth and seventeenth centuries also highlighted Basque whaling along the Labrador coast. In 1972, historical geographer Selma Barkham discovered information on the location of Red Bay and several other Basque whaling stations while studying sixteenth-century Basque legal documents in northern Spain. Barkham's discoveries prompted an

archaeological survey in 1977 to confirm a Basque presence at a number of sites on the southern Labrador coast. Land excavations at Red Bay took place under the direction of Dr. James Tuck, of Memorial University of Newfoundland, from 1978-1992 (Tuck 2005:1). Underwater excavations directed by the Canadian Parks Service began in 1978 and ended in 1985 (Grenier 2007:I:22). They uncovered evidence of a substantial whaling operation, including a Basque cemetery, sunken galleons, small whaling boats, cooperages and several tryworks (Tuck and Grenier 1989). Most of the structures were distinguished by the presence of large quantities of red ceramic roof tiles, brought from the Basque country. The remains of tryworks largely consisted of the lower fireboxes, made from local granite, but occasionally imported sandstone or limestone ballast rocks (Tuck 1982:58), as well as clay or earth for the construction of ovens (Barkham 1973:93-94, 1974:81). Over 100,000 recovered artefacts reflect daily food preparation and work-related activities. The relatively small amount of archaeological material remaining in Red Bay from sixty years of seasonal occupation seems to corroborate what we know from the historical documents; that the whalers packed up at the end of each season with little planning for their return the following summer (Logan and Tuck 1990:67).

In 1982, a cemetery was discovered at the eastern end[1] of Saddle Island, in Red Bay harbour. Most burials were just 30 centimetres below the ground surface in an area bordered by a large natural bedrock ridge (Tuck 1989a:219-220). Sixty-two burials contain the remains of over 140 individuals. Physical anthropologists Dr. F. J. Melbye of

[1] Archaeologists established the Saddle Island excavation grid approximately 90º clockwise from Magnetic North. This rotation appears to be corrected on later maps.

the University of Toronto (1982), Dr. Sonja M. Jerkic of Memorial University of Newfoundland (1983), and Brenda V. Kennedy of the University of Calgary (1983-1985) were onsite for the excavations and conducted preliminary analyses of the remains. Shell fragments and whalebone provided a favourable environment for preserving the bone (Tuck 1983:101, 1984:76-77). Fewer than 25 percent of the individuals interred in the cemetery were removed from the ground for further analysis (Kennedy 1988:100). Poorly preserved skeletons were recorded and reinterred (Tuck 1989a:220-221). The main cemetery was restored at the close of excavations and the original rock grave markers replaced above the burials.

Kennedy (1988:99-101) describes the 57 burials excavated from within the main cemetery as a population of generally healthy men who died during early to middle adulthood, in addition to several juvenile males. Early estimates determined a minimum of 125 individuals were located within single and multiple burials ranging from two to thirteen individuals, including a group of unburied dead. The majority of males were positioned head to the west, lying on their back, legs extended, feet together and to the east, with their hands placed over their pelvis or chest. Burial patterns observed during excavation indicated that individuals were interred directly in the ground, except in a few instances where small fragments of wood and nails indicate a coffin burial. Stones used to mark the graves seem to be limited to the eastern half of the cemetery. Despite poor preservation and few complete skeletons recovered for analysis, Kennedy (1988:101) suggested probable causes of death due to occupational accidents or deficiency diseases that whalers may have suffered during years where crews were forced to overwinter.

Although there were no observable indications for cause of death from any of the skeletons, some of the multiple interments may offer circumstantial evidence, and such lines of evidence will be re-examined in this thesis. A burial containing seven whalers may be the result of a whaling accident that resulted in the death of a full crew aboard a whaleboat (Tuck and Grenier 1989:60). However, multiple interments can also represent a single event of disease. It only makes sense that the dangerous tasks involved in whaling would occasionally result in disaster. Some of the single interments may be whalers who drowned in pursuit of the kill. The feature containing 11-12 unburied individuals inside a small structure may be a group of whalers who died during a forced overwintering (Tuck 1983:103). Such overwinterings were known to have happened during the winters of 1574-1575, 1576-1577 and 1604-1605 when the rapid onset of ice trapped the last galleons before they could depart for Spain in December (Barkham 1984:516). The overwintering of 1576-1577 was disastrous for several ships in at least three Labrador ports (Barkham 1982:62). While suffering scurvy incurred by the wintering in Labrador, Juan Martinez de Larrume delivered his last will and testament at Red Bay on June 22, 1577 (Barkham 1977a:579; Tuck and Grenier 1989:56). It is likely that many whalers suffered the same fate during these harsh unexpected winters in Labrador. It is unlikely that the Red Bay cemetery is the only cemetery of its kind along this coast considering the hazards of the occupation and the number of whalers who frequented the Strait through the sixteenth century. Of course, many whalers' lives were likely lost at sea and their bodies never recovered.

1.4 Objectives of Research

The skeletons and burial practices of the whalers in Red Bay will be studied using a bioarchaeological approach. The goals of bioarchaeology include the study of human skeletal remains, associated artefacts, and archaeological contexts in order to reconstruct past biological, cultural, historical and environmental conditions and processes (Buikstra 1977; Buikstra and Beck 2006; Larsen 1997). The Red Bay skeletal material is unique in the world since it represents the only existing sample of whalers available for study from the sixteenth century. As well, Red Bay affords a rare opportunity to examine human skeletal material in this province; Newfoundland and Labrador soil seldom provides the unique preservation of organic remains as in the Red Bay cemetery.

Kennedy (1985, 1988) performed a cursory examination of the Saddle Island skeletal material, describing the archaeological context of skeletal positions, sex determination and broad age categories. However, for the skeletal material to contribute further to the understanding of the life and death of Basque whalers at Red Bay a thorough and detailed osteological study is necessary. The objectives of this thesis are three-fold:

(1) To digitize the burial maps and analyse burial characteristics, including grave type and skeletal position, to determine if patterns emerge between treatment of the dead within or between the single and multiple graves, and the buried versus "unburied" graves.

(2) To identify, measure and describe the human skeletal remains removed from the cemetery.

(3) To assess the skeletal remains for pathological conditions and determine if skeletal changes developed as a result of occupational (whaling) activities.

The results of these objectives are presented in this thesis.

Chapter 2 presents the historical background of cultures that have lived in Red Bay and results of previous archaeological research on Saddle Island,

Chapter 3 introduces the context of discovery and reviews the results of archaeological research at the Red Bay whaling station, including the preliminary findings at the cemetery.

Chapter 4 reviews osteological research on known whaling populations from Dutch, Danish and Norwegian whaling crews during the seventeenth and eighteenth centuries.

Chapter 5 outlines the material and methods used throughout this study, and describes the collection and its condition, discussing any limitations of the collection, as well as outlines the methodologies used in my analyses.

Chapter 6 presents an intrasite comparison of burial patterning and principles of interment on Saddle Island. For example, what similarities and differences exist between single and multiple interments, or between burials inside and outside the cemetery boundary?

Finally, Chapter 7 examines the results of osteological analyses by describing the population, the number of individuals, their sex, age, stature, ancestry, and health. Any patterns of degenerative change resulting from strenuous activities will be discussed in reference to whaling and mariner activities.

Chapter 2 Historical Background and Documentary Evidence

The men who sailed annually from the Basque Country to hunt whales along Labrador's southern shore were responsible for supplying train oil to Europe during the sixteenth century. At that time, Red Bay was the centre of the world's whaling trade. This chapter describes the Labrador landscape and presents a culture history of Red Bay before introducing the Basque country and its people, and finally, the industry which led them to cross the Atlantic in pursuit of a whale.

2.1 Physical Environment

Red Bay is a naturally protected harbour along the south coast of Labrador (Figure 2-1). Labrador makes up the mainland portion and northern half of the province of Newfoundland and Labrador, Canada. The Strait of Belle Isle is a narrow passage of water between the island of Newfoundland and the south coast of Labrador, and was known to the Basques as the Grand Bay (Barkham 1980a:67). Many of the harbours along the Labrador side of the Strait are formed by rocky highlands with sandy or rocky beaches. Red Bay is sheltered from the often harsh coastal climate by three islands; Saddle Island lies across the entrance to the harbour, Twin Island just east of the harbour's entrance, and Penney Island which separates the main harbour from the inland portion known as the Basin. The shelter and deep waters provided in Red Bay have made the harbour attractive to humans for thousands of years.

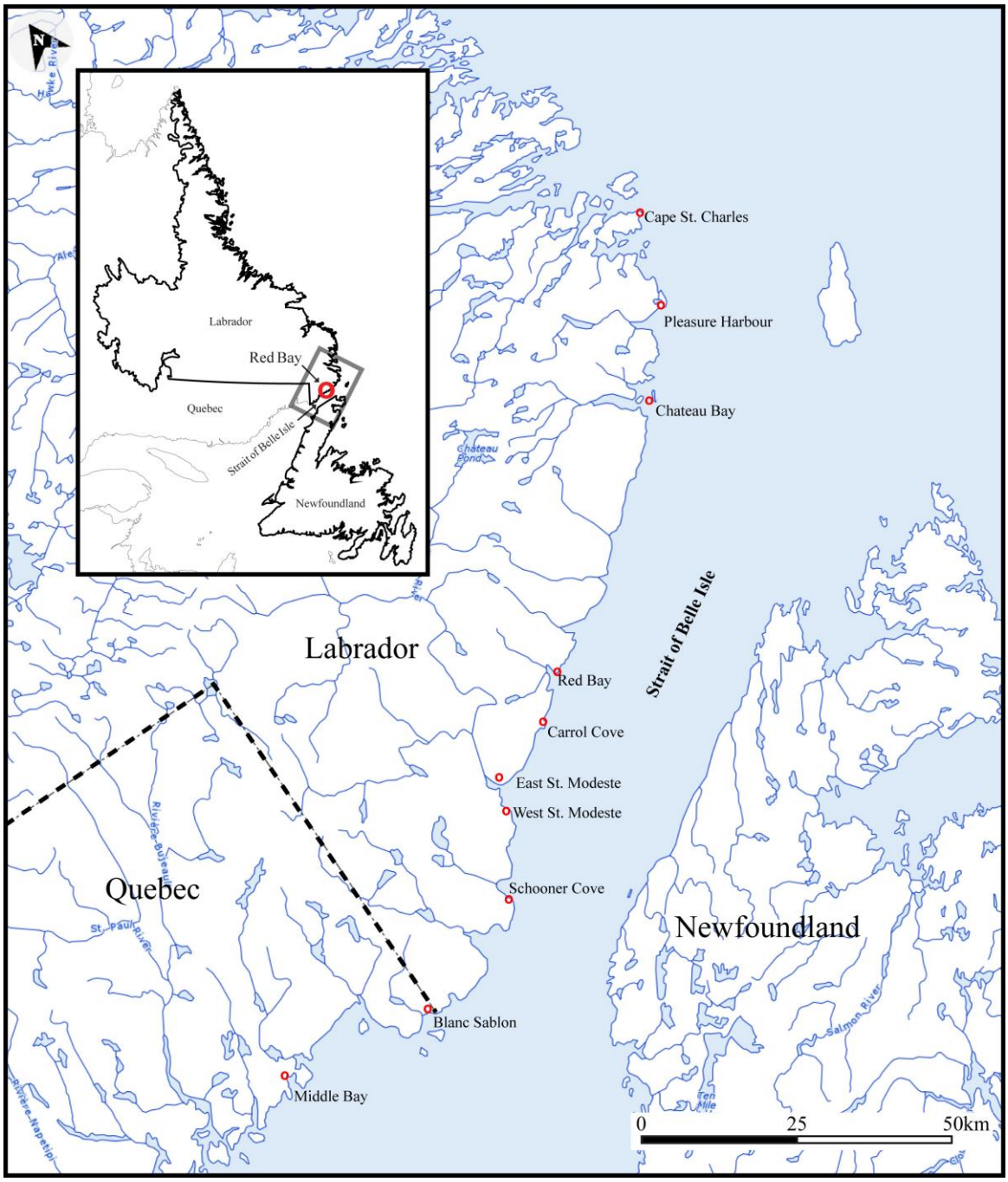


Figure 2-1 Location of Red Bay, Labrador, along the Strait of Belle Isle, along with other major harbours used by Basque whalers during the sixteenth century.

Climate and weather conditions along the Strait of Belle Isle are influenced by the cold ocean waters of the Labrador Current and the icebergs it brings southward each spring and early summer. The Labrador Current flows southward along the east coasts of Labrador and Newfoundland until it meets the warm Gulf Stream. The Labrador Current funnels through the Strait of Belle Isle to the warmer waters of the Gulf of St. Lawrence. Because of this, and together with prevailing easterly and northeasterly winds, Red Bay frequently experiences wind and fog. Today, Red Bay's summers are short with average temperatures around 10 ºC often reaching into the high 20s ºC by August. Autumn comes early with the first frost often occurring by mid-September. Winter temperatures average -10 ºC but by January temperatures are known to plummet to -34 ºC. Red Bay receives approximately 530 mm of rain and 415 cm of snow annually. The ocean surface usually freezes in January and remains so until April (Environment Canada 2004; Parks Canada 2004). Sea ice usually persists in the Strait of Belle Isle until the end of May (Farmer 1981:70).

During the height of whaling operations at Red Bay, between A.D. 1550 and 1600 (Tuck and Grenier 1989:3), Basque fishermen would have experienced similar but slightly cooler weather. The second half of the sixteenth century coincided with the onset of the Little Ice Age, a climatic change characterized by generally cooler than present temperatures, lasting into the nineteenth century (Lamb 1995:202). These colder temperatures resulted in glacial advances, increased Arctic sea ice, pack ice, and storm activity (Lamb 1995:207-209). At the height of Basque whaling in Labrador, summer temperatures would have been the coldest they had been in the previous 500 years

(Kreutz et al. 1997:1295) which may have resulted in longer winters and shorter summers.

The Strait of Belle Isle funnels a wealth of marine species through its waters and is host to a rich ocean food chain. The southern Labrador marine ecosystem includes innumerable groundfish and pelagic fish species, shellfish, and a diverse range of marine mammals; including seal, dolphin, porpoise, and whales. Today there are about 17 cetacean species, including harbour porpoise, sperm whale, humpback whale, and the blue whale (Shears and O'Brien 2004). In the sixteenth century, this list also included the northern right and bowhead whales hunted by the Basques, but they are no longer found in the Strait of Belle Isle (Tuck and Grenier 1989:4).

While cod and sardines appear to have been a common staple aboard many Labrador bound whaling voyages (Barkham 1981a:9, 54, 2007a:V:49, 61), the Basque caught fish, primarily cod, to supplement their daily rations once in they landed in Labrador (Stevens et al. 2007:IV:135).

The southern coast is also home to a variety of bird species. Migratory waterfowl begin arriving in the spring followed by several species of raptor in time for summer. The fall migration brings a variety of shorebirds in large numbers while only a few species overwinter along the Straits. Terrestrial animals are abundant, including ground hog, otter, beaver, porcupine and hare; fox, arctic wolf, wolverine, lynx, martin, caribou, black bear, and occasionally polar bear.

A limited sample of faunal remains representing potential food resources was located during underwater exploration, further suggesting Basques exploited local resources. Species include the common eider duck, great auk, polar bear, seal, gulls, white-winged scoter, oyster, and mussels (Stevens et al. 2007:IV:137-138).

The flora of Red Bay has been relatively consistent for the last 8000 to 9000 years. Described as upland tundra, Red Bay has a rocky, treeless, barren landscape mixed with tuckamore (spruce, fir, and alder stunted by the wind) and a variety of northern and alpine shrubs, wildflowers, and herbaceous plants, many of which are dwarf variants (Parks Canada 2004). The barren and boggy areas provide a wealth of local berries, including bakeapple (cloudberry), crackerberry (Canadian dogwood), partridgeberry (lingonberry), wild strawberry, blueberry, and stemless arctic raspberry. Parks Canada recovered bakeapple seeds from the Saddle Island underwater debris field (Stevens et al. 2007:IV:138) but it is unknown whether these were the remains of Basque meals, or if they were naturally occurring.

Sixteenth-century provision lists make no reference to the Basques attempting to transplant or maintain seasonal gardens while overseas (Barkham 1981a, 2007a). It is unlikely that plant species native to the Basque country would survive in the acidic soil of southern Labrador.

2.2 Demographics (c. 9000 B.P. – 1630s)

There is archaeological evidence for almost 9000 years of continuous human habitation in Red Bay (Tuck 1992:12, 2005:1), making it one of the longest occupied harbours in southern Labrador. Since it is theoretically possible that any of the cultures that occupied Red Bay could have buried their dead on Saddle Island these culture groups are briefly discussed in the following sections before introducing the Basque.

2.2.1 Aboriginal Groups

During the last glaciation, the late Wisconsinan, Labrador was covered by the Laurentide Ice Sheet. Around 10,000 to 11,000 B.P. the ice began to recede. As the coast became accessible, and the land and sea stabilized, Palaeoindian people moved into southern Labrador from the St. Lawrence region by approximately 9000 B.P. (McGhee and Tuck 1975; Renouf 1976). Archaeological evidence from the Pinware Hill site, just west of Red Bay, suggests an initial occupation date of 8800 B.P. (McGhee and Tuck 1975) and it is believed Red Bay was inhabited by about the same time (Tuck 1992:12).

Within Red Bay itself, archaeologists have found evidence of Palaeoindian (8800 B.P.), Maritime Archaic Indian (7500 to 3000 B.P.), Groswater Palaeoeskimo (3000 to 2100 B.P.), Middle Dorset Palaeoeskimos (1800 to 1400 B.P.), and Recent Indian groups (2000 B.P. to contact), as well as Thule and historic Inuit peoples (Pastore and Auger 1984; Robbins 1998; Tuck 1984, 1985, 1986, 1987a, 1988, 1989a-b, 1990, 1992, 2005).

However, the only native groups living in southern Labrador during the time of the Basque whaling industry were Inuit and Recent Indian peoples.

In addition to the archaeological record, Jacques Cartier reported an Iroquoian hunting group that traveled approximately 1000 km east to the south coast of Labrador for fish and seal during the sixteenth century (LeHuenen 1984:522).

2.2.2 Early Europeans

The first Europeans to visit the shores of Labrador were probably the Norse who visited around the year AD 1000 (Magnússon and Pálsson 1965:54-56) and may have returned intermittently along the coast of Labrador until the fourteenth century. There is no evidence to indicate the Norse ever visited Red Bay.

Despite England's claim to Newfoundland and Labrador made by John Cabot in 1497, France and Portugal were the first European nations after the Norse to arrive (LeHuenen 1984:522). Bretons pioneered voyages to the Strait of Belle Isle for cod fishing and French Basques gradually followed their lead (Barkham 1982:54, 1984:515-516). It was probably during these voyages that reports of rich whaling grounds were brought back to the Basque fishing ports (Barkham 1984:515). Some of the initial whaling expeditions may have been led by French Basques, but by the 1540s Spanish ships were delivering large cargoes of whale oil to Bristol, London, and Flanders, as well as local Spanish and French ports (Barkham 1984:518).

When Jacques Cartier arrived in the Strait of Belle Isle in 1534, one of the harbours was already known as "Whale Harbour" (Biggar 1924:15). This was Red Bay on the southern shore of Labrador.

2.3 The Basques and Whaling

The Basques are a culturally and biologically distinct group whose blood types and language differ remarkably from surrounding populations. The Basque Country, *Euskal Herria*, refers to the seven historical provinces where the Basque language is spoken. Their language is pre-Indo-European, unrelated to any existing language, and a major part of their identity. They call themselves *Euskaldunak*, literally translated as "speakers of the Basque language" (Douglass and Bilbao 1975:9). The Basque Country straddles the French-Spanish border along both sides of the western Pyrenees and stretches 160 km along the Bay of Biscay on the Atlantic Ocean (Figure 2-2). Four of the traditional historical Basque regions, [Vizcaya (Bizkaia), Guipúzcoa (Gipuzkoa), Álava (Araba), and Navarre (Nafarroa),] are part of Spain, while the remaining three, [Labourd (Lapurdi), Basse-Navarre (Nafarroa Beherea), and Soule (Zuberoa),] are in France (Douglass and Bilbao 1975:9; Hualde et al. 1995:12-13).

Basques were hunting whales from small boats in the Bay of Biscay from at least as early as the eleventh or twelfth centuries (Aquilar 1986:192; Barkham 1974:75, 1984:515; Proulx 2007a:I:26). The industry was highly dangerous but extremely profitable since almost all parts of the whale could be used. There were occasions when

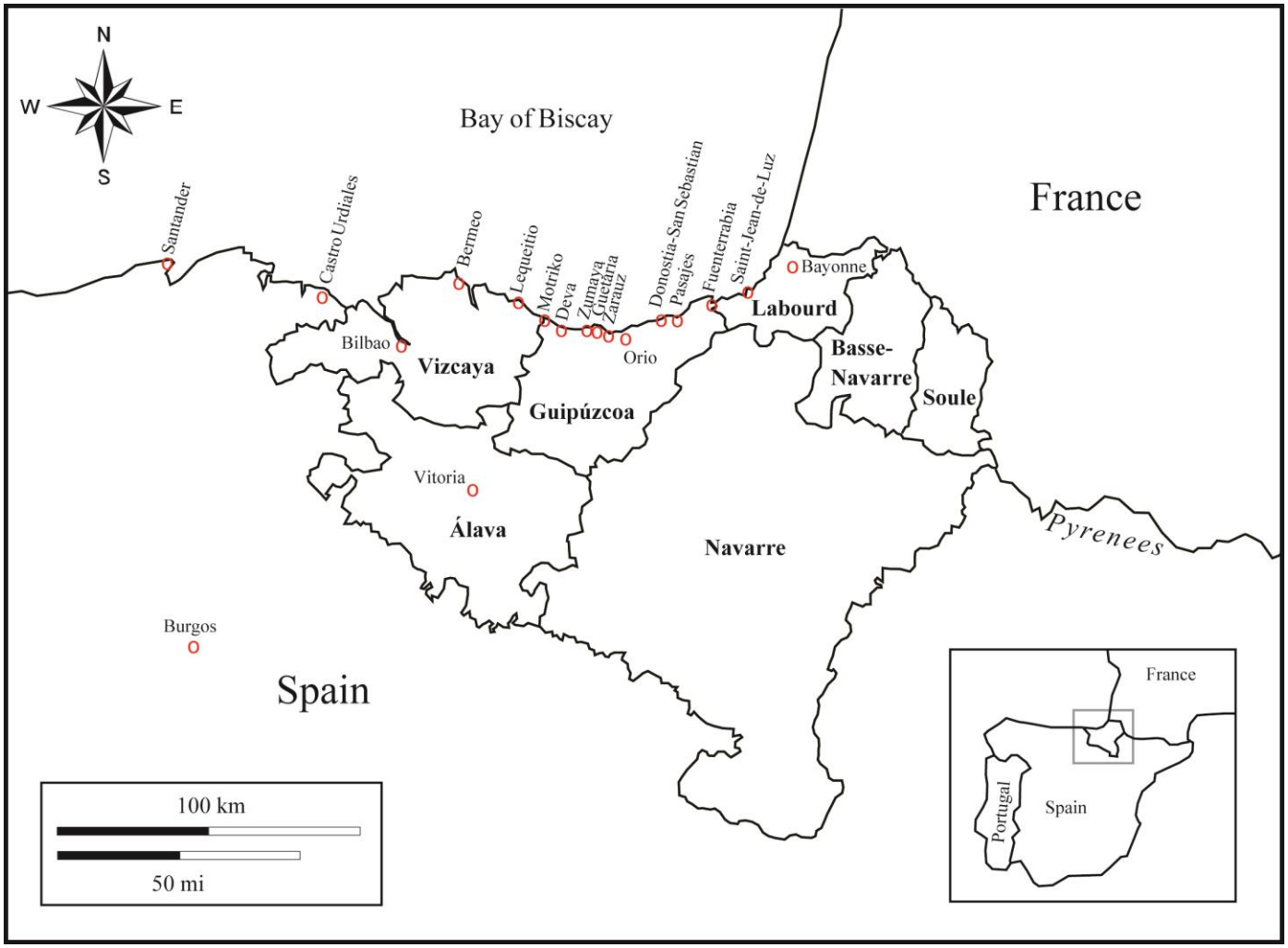


Figure 2-2 Map of traditional historical provinces of the Basque Country, and the major ports and towns involved in the sixteenth-century Basque whaling enterprise.

the King, local government, or church officials would demand part or the entirety of the whale as tribute (Markham 1882:366). The importance of the whale fishery is still represented along the Basque coast where several towns display whales and whaling scenes in their coats of arms (i.e. Fuenterrabía, Guetaria, Motriko, Lequeitio, Bermeo, and Castro Urdiales), some dating from as early as the Middle Ages (Markham 1882:266; Proulx 2007a:I:26; Tuck and Grenier 1989:8). As the Basques pursued cod outside the Bay of Biscay and north to exploit whales in their summer grounds in Norway, Iceland, and Greenland, word of rich whaling grounds in the Strait of Belle Isle eventually led them to Labrador. They had already perfected whaling techniques at home and set forth to create a successful monopoly of whaling in Labrador, within the province of *Terranova*, as it was known in the sixteenth century (Barkham 1974:73, 1980a:67, 1984:515).

Basques became the world's supplier of whale and cod products in the sixteenth century. They financed their trans-Atlantic whaling voyages through private venture capital obtained from agents in Spain and the Basque Country. These expeditions were an expensive investment that promised a high return for owners, investors, and crew, as long as the hunt was successful. In turn, the strongest and best mariners, whalers, and coopers were hired to insure the ship returned with a full cargo. The blubber from bowhead and right whales could be processed into oil that could be used in lighting, soap making, lubrication, medicines, ship caulking, and textile manufacture. Any waste or damage to the ships and cargo in transit to the European market was costly, and owners, victuallers, and outfitters regularly insured their investments against loss (Barkham

1980a:67-68, 1980b, 1984:517-518; Proulx 2007b:I:46-50, 75-78). Every crewmember was gravely affected if the voyage was not successful; the crew's shares from each whaling voyage was directly dependent on the size of the cargo (Barkham 1981a:14-15, 2007a:V:51-52). The Basques shipped oil from Labrador to England, Holland, and France, as well as to home ports.

2.4 Whaling in Labrador

The Basques were not the first to hunt whales in Labrador. Northern peoples have hunted whales in Arctic regions for thousands of years. The first whalers in Labrador were possibly the Thule, the ancestors of present day Labrador Inuit. By the late fifteenth century, Thule groups began settling northern Labrador bringing with them a 1500 year old maritime hunting tradition, a culture derived from whale hunters originating along the coast of the Bering Sea (McGhee 1990:77, 85). The Thule are the only precontact people in the province who are known with certainty to have actively hunted whales. Although, it is quite possible earlier Palaeoeskimo and Maritime Archaic groups sought whale meat and bones, the archaeological evidence cannot substantiate anything more than that these peoples scavenged carcasses found washed ashore or frozen in sea ice.

It is likely that the Basques first learned the potential of whale products using scavenged drift whales for their meat. In time they hunted the large cetaceans from small boats along the coast of the Bay of Biscay. Eventually the value of the blubber, and later baleen, promoted the hunt. The Basques developed a unique hand harpoon whaling

method sometime in the early Middle Ages (Lindquist 1997:38) and established the first regulated commercial whale fishery by the eleventh century (Aquilar 1986:192; Conway 1906:40).

Basque fishermen were among the first Europeans to frequent the shores of Newfoundland and Labrador. The Basque presence on the eastern Atlantic seaboard was focused on cod-fishing and whaling since the early part of the sixteenth century. French Basques may have sent early whaling expeditions to Labrador but their Terra Nova ventures concentrated primarily on the cod fishery throughout much of the sixteenth century (Barkham 1974:75). By 1580 the Spanish Crown began requisitioning fishing vessels for its navy and, as a result, Spanish Basque whaling and cod fishing voyages to Terranova began to decline. During this time French Basque imports of cod fish and whale oil increased. A smaller number of Spanish Basque ships continued to sail to Terranova until the early seventeenth century on combined cod, whale and seal fishing ventures (Barkham 1994:2-5).

Archival documents reveal that whaling was the primary and most important industry for the Spanish Basques by the 1540s (Barkham 1974:75, 1984:518; Proulx 2007a:I:30). Basques began whaling in Labrador in the 1530s and returned yearly until the 1630s, with their heaviest involvement between 1550 and 1590. By the mid-century a large whaling industry operated out of Red Bay, known as *Butus*, and other harbours in the Strait of Belle Isle (see Figure 2-1). Twenty to thirty galleons, each between 180 and 750 tons of burden (Barkham 1978:10; Barkham 1981b:3-4, 2007b:V:2-3), arrived each year in Labrador from ports such as San Sebastian, Orio, Guetaria and Saint-Jean-di-Luz,

together carrying between 1000 to 2000 men at the peak (Barkham 1977b:9). They arrived early each summer as the pack ice disappeared sometime in June (Biggar 1930:462) and in time for the northward migration of whales. The crew proceeded to build or repair shore structures, including tryworks[2], landing stages[3], wharves, cabins, cooperages[4] and lookout stations[5]. A late season of whales returned to the Strait of Belle Isle again in the fall and early winter, as they moved southward from their arctic feeding grounds. Basque galleons departed when they reached full cargo, sometimes in the late summer but more often by the late fall. An average of 440 whales were killed annually translating to around 20,000 barrels of oil, each weighing 400 pounds (Barkham 1977b:9, 1978:10, 1984:518). In Red Bay alone, nine or ten of these galleons (Barkham 1978:13, 1982:58) would annually produce anywhere from 6000 to 9000 barrels of whale oil that would have been sent back to Europe during the peak period of exploitation (Barkham 1984:516). Some estimates suggest a minimum of 17,600 whales killed, resulting in 800,000 barrels of oil, during the entire Spanish Basque whaling industry in Terranova from the mid-sixteenth to the early seventeenth century (Ross 1985:1).

We previously understood that the whales hunted in the spring/summer were North Atlantic right whales (*Eubalaena glacialis*) and the bowhead whale (*Balaena mysticetus*) during the autumn/winter whaling season (Cumbaa 1986a:189, 1986b:70; Tuck and

[2] Tryworks are rendering ovens constructed of shallow copper cauldrons arranged on top of a series of stone fireboxes (Tuck and Grenier 1989:15). Fires are lit below the cauldrons and the whale blubber is slowly rendered into oil.
[3] Landing stages are wharves over shallow water where whale carcasses are towed to remove strips of skin and blubber for rendering.
[4] A cooperage is a building where coopers make barrels.
[5] Lookout stations were located on hilltops to spot whales.

Grenier 1989:5-6). However, recent DNA analysis concludes that the bowhead whale was the primary species, accounting for at least 90 percent of the samples, hunted along the Strait of Belle Island and Gulf of St. Lawrence during the sixteenth- and seventeenth-century whale fisheries (McLeod et al. 2008:66). It is therefore more likely the distinct whaling seasons merely represent bowhead whales with differing migration patterns that segregate on the basis of sex or age classes, as modern population still exhibit (McLeod et al. 2008:70).

Insurance records illustrate the whaling voyages lasting a minimum of six months but regularly took up to eight or nine months before they returned to home ports (Barkham 1980b:93-94). Whaling vessels set sail for Terranova as late as July, and returned from Labrador just before Christmas. Whaling frequently continued into November or December with occasional ships iced in longer (Barkham 1974:75-76).

Despite the detailed notary documents uncovered by Barkham during her archival work in Spain, very little is known about the actual process of whaling during the sixteenth century. Fortunately, skilled Basque whalers were hired on for the Spitsbergen whaling trade (1611 to 1800) to teach the English and Dutch the Basque system of whaling (Hacquebord 1994:290). From these techniques the earlier methods used at Red Bay can be extrapolated.

Whales were hunted by crews of six or seven men in small lightweight boats, called chalupas. At least three or four chalupas were typically used to pursue a whale, while a large whale may have required at least five chalupas to tow it back to the shore

station (Barkham 1978:13). Each boat held a crew of six to seven men including a harpooner at the bow and a helmsman at the stern. The oarsmen would make their final approach by rowing quietly with muffled oars until they were close enough for the harpooner to thrust the barbed harpoon into the whale. Harpooning was a specialized skill carried out by the largest and strongest crewmembers. After harpooning the whale, the oarsmen rowed quickly in reverse to avoid being capsized by the whale's huge tail. Alternately, the whale would dive to the safety of great depths, dragging the men and boats with it. The whale could dive with harpoon, line, and drogues (buoys) attached until it had to resurface for breath. Upon resurfacing, the whalers had to navigate close enough to the whale to attach additional harpoons and drogues. Eventually the animal became exhausted and usually died from being lanced. Hunting and killing a whale could take hours, sometimes more than a day, and required several boats to tow the whale back to shore (Gunson 1990:61-65; Tuck and Grenier 1989:14-15).

Shore stations were set up adjacent to deep water that would allow whale carcasses to be manoeuvred close to shore. The dead whales were towed to these stages along shore, where blubber was cut off and minced. Each shore station consisted of activity areas related to the processing of whale blubber and the assembly of casks. The tryworks were strategically placed close to wharves where the whales were flensed. Copper cauldrons placed over fireboxes rendered the blubber into oil, which was stored in barrels for shipping to Europe. Cooperages were located behind the tryworks for convenience of transporting casks to tryworks (Tuck and Grenier 1989:38-43). If the galleon's hold was not full by the end of summer, the crew would stay on for the autumn

bowhead migration. By December the whalers were working in shifts around the clock to fill the galleon's hold and beat the advance of winter ice. No doubt the Basque whaler's life in the Grand Bay was physically demanding. Joanes de Echaniz, who perished in Carrol's Cove, Labrador, on December 24, 1584, dictated his will to only two witnesses "because it was midnight and some of the sailors of the ship were working on land rendering whale to make train oil and the others were sleeping on board exhausted due to sheer work" (Barkham 1982:85).

Spanish Basques dominated the whaling fishery; the owners, officers and crews were almost certainly Basque, with few exceptions (Barkham 1976:237). While French Basques were known to use Labrador ports during this same time period, their involvement concentrated on the cod fishery until the late sixteenth century to early seventeenth century (Barkham 1974:75). The historical documents indicate that all Spanish Basque ships bound for Terranova were outfitted with an array of arms. The whaling galleons were equipped with heavy artillery, including cannons, swivel guns, arquebuses (early muskets), gunpowder, crossbows, pikes, as well as body armour and helmets. Practically every man aboard a whaling expedition brought his own sword, arquebus, or crossbow (Barkham 1980c:1, 1982:56-57; Barkham 1981b:34-36, 2007b:V:16-17).

Certain vessels were sent to Terranova not to catch fish but to steal it from competing enemy nations. It appears that 1554 was a particularly contentious year for privateering in which Red Bay saw roughly double the number of ships, 16 or 17, than it did during the peak whaling years in Red Bay. In this same year, a battle between French

and Spanish Basque ships on the Labrador coast resulted in one fatality and several wounded men (Barkham 1982:57-58). Generally, the Basque whaling ships in Labrador seemed to avoid the attacks that their cod fishing countrymen incurred because they were well manned and armed. While the "whalers with their powerful galleons" remained immune to many foreign attacks in Labrador, these same ships subsequently were lost when embargoed as part of the Spanish navy in the latter half of the end of the sixteenth century (Barkham 1982:62).

By the 1580s the whaling ships were returning to Spain half empty. The end of the Basque whaling operations in Labrador resulted from a combination of three main factors. First, although it is not known exactly how many whales were killed in the Grand Bay during the sixteenth century, the whaling industry had a severe effect on whale populations; today North Atlantic right and bowhead whales no longer migrate through the Strait of Belle Isle. It is estimated between 25,000 and 40,000 whales were killed during the Basque whaling years of 1530 to 1610 (Aquilar 1986:196). However, some researchers postulate that the advance of sea ice around Greenland and Iceland during the Little Ice Age pushed northern whale species south of their normal migration routes into Labrador waters. Climate data from parts of Europe show that during the Little Ice Age the summers of the 1570s were outstandingly cold (Lamb 1995:203). During the 1580s the advance of sea ice during the Little Ice Age cut off access to Greenland and blocked the Denmark Strait with pack ice during several summers (Lamb 1995:207). This could account, in part, for depleted whale stocks towards the end of the sixteenth century, or at

least why whales occupied the Strait of Belle Isle then, but not presently (McLeod et al. 2008:67).

Second, during the latter half of the sixteenth century Basque whaling ships were being embargoed for service in the King's navy, including Philip II's Great Armada, many of which were lost. The private capital used to finance these whaling ventures was no longer available from Spain. The third factor culminating in the end of the Labrador whaling industry was the opening of the Svalbard (Spitsbergen) whaling fishery at the beginning of the seventeenth century. Basque ship owners, who once sent their ships to Terranova, now helped to fit out Dutch and English ships with Basque whaling skills, including their men. These combination of factors ended the Basque monopoly of the whale oil trade by 1630 (Barkham 1977c:77-78, 1978:18-19, 1980b:94-95), though some whaling continued with lesser intensity through the late seventeenth century (Aquilar 1986:196).

Chapter 3 The Site and Context of Discovery

Up until the collaboration of archival research and archaeological excavations in the late 1970s, very little was known of the establishment of Basque whaling stations in Labrador. Selma Barkham's research in Spain (see Chapter 2) provided new information concerning Basque whaling along the southern Labrador coast during the sixteenth century. Red Bay is most commonly mentioned in records that discuss whaling, including piracy documents, insurance and lawsuit records, and the second oldest known Canadian will of a deceased whaler who was forced to overwinter in Labrador (Barkham 1977a:579, 1984:516; Proulx 2007a:I:33). Even today Red Bay is revered by local fishermen as one of the best harbours along the Strait of Belle Isle, and so it makes sense that Basques were attracted to this harbour for the same reasons over 450 years ago.

3.1 The Site

In 1977, an archaeological survey undertaken by Selma Barkham, Dr. Graham Rowley, Dr. James Tuck, and Walter Kenyon of the Royal Ontario Museum, among others, quickly confirmed the southern Labrador coast was host to numerous whaling operations, even more than those mentioned in Spanish archival documents uncovered by Barkham (1974, 1976, 1977b). With thousands of roof tile fragments, remnant tryworks, and a sunken whaling galleon in her harbour, Red Bay became the obvious choice to unveil evidence of the world’s first capital venture in whaling.

Land excavations at Red Bay took place under the direction of Dr. James Tuck, of Memorial University of Newfoundland, from 1978 to 1992 (Tuck 2005). Underwater excavations directed by the Canadian Parks Service began in 1978 and ended in 1985 (Grenier 2007:I:19). Together they uncovered evidence of a substantial whaling operation that included a cemetery, three sunken galleons, small whaling boats, cooperages and several tryworks (Tuck and Grenier 1989). A fourth whaling galleon was located during one of Parks Canada's regularly scheduled surveys in 2004 (Gibbons 2007:IV:390).

3.2 Excavations

Archaeological excavations located over twenty shore stations in Red Bay harbour (Tuck and Grenier 1989:38). Most of the structures are distinguished by the presence of large quantities of red ceramic roof tiles, brought from the Basque country. The remains of tryworks largely consist of fireboxes made from local granite, and occasionally from imported sandstone or limestone ballast rocks, and clay (Tuck 1982:58, 2005:3).

The domestic dwellings include substantial tile-roofed buildings that served as cooperages. It is likely that the coopers lived in the same structures where they carried out their trade. The artefacts associated with the cooperages include fine glassware, ceramics and personal items that support status differences between the coopers and the whalers. The whaleboat crews appear to have set up their accommodations a distance from the shore stations, in areas where it was easy to launch their boats. Most of the

dwelling structures in Red Bay consist of impermanent structures constructed of whalebone and wood, built along natural bedrock outcrops where they were sheltered from the winds. Very few artefacts are associated with these dwellings (Tuck and Grenier 1989:43-46). Archival documents indicate the majority of crews slept aboard ship when they were not working (Barkham 1981a:21-23, 2007a:V:53-55; Barkham 1982:85).

Underwater exploration by Parks Canada from 1978 to 1985 revealed three galleons, a mid-size pinnace, and three chalupas (Tuck and Grenier 1989:27-37). This is the largest collection of sixteenth-century watercraft from any single location in the world, and includes the *San Juan* which is Canada's earliest known shipwreck. Land and underwater archaeological excavations recovered well over 100,000 artefacts although luxury goods are virtually absent. Ceramics, glass and personal possessions littered the floors of the cooperages, while clothing and textiles were recovered from the cemetery. Most of the artefacts reflect daily food preparation and work-related activities. Logan and Tuck (1990:66) suggest that although the variety of artefacts was great, the actual quantity of material was sparse when compared to other European sites in North America that were occupied year-round. The pattern of settlement in Red Bay appears to be scattered, suggesting that the whalers left Red Bay in the winter rarely planning for their return the following summer.

3.2.1 The Cemetery

In 1982, a cemetery was discovered at the eastern end of Saddle Island, in Red Bay harbour (Figure 3-1). Most burials were just 30 cm below the ground surface in an area bordered by a large natural bedrock ridge (Tuck 1989a:219-220). Excavations unearthed a total of sixty-three burial features containing approximately 140 individuals. Physical anthropologists, Dr. F. J. Melbye of the University of Toronto (1982), Dr. Sonja Jerkic of Memorial University of Newfoundland (1983) and then PhD candidate Brenda V. Kennedy of the University of Calgary (1983 to 1985), were onsite for the excavations and conducted the preliminary analysis. In some areas, shell fragments from the ancient beach, and remnant whalebone counteracted the natural acidic soil and provided favourable environment for preserving some of the bone (Tuck 1983:101, 1984:76-77). Kennedy (1988:100) originally stated less than 25 percent of the total individuals interred in the cemetery were removed from the ground for further analysis. Poorly preserved skeletons were recorded and reinterred (Tuck 1989a:220) and the original rock grave markers restored above the burials.

Kennedy provided only a cursory examination of the skeletons and burials while in the field. With the exception of two immature individuals aged about 12 years, all of the skeletons are those of adult European males aged 20 to 45, short of stature but of very robust build. Most lay resting on their backs, heads to the west and hands folded on the chest or near the waist (Tuck 1984, 1986, 1989a, 2005). The burials recovered from 1982 to 1985 were all found within the natural limits of the cemetery, designated Area L. Approximately half of the graves contained a single skeleton, the remainder contained

Figure 3-1 Map of Saddle Island in Red Bay, Labrador, showing locations of (L) the main cemetery in Area L; (M) five burials located just outside the natural bedrock boundary of the main cemetery in area M; and (B) the woolen shirt and insect casings from a possible burial in Area B.

between two and thirteen individuals. The multiple interments include: Burial 1, a pit feature with as many as 13 individuals buried overlapping one another; and Feature 1, containing the unburied remains of 12 whalers abandoned on the floor of an impermanent structure.

In 1986, five human burials and one empty grave pit were identified outside the natural bedrock boundary to the main cemetery in Area M. These burials provided the first evidence of intentional grave goods at Red Bay. A wooden cross was placed on the chest of one individual who appeared to be wearing a cloak. Another grave located in peat bog contained no preserved bone but did contain a nearly complete woollen outfit, human hair, and finger and toe nails. A triple burial contained one skeleton with the head to the east while the other two individuals were oriented with heads to the west (Tuck 1983, 1984, 1985, 1989a, 2005).

3.2.2 Human Remains Outside the Cemetery

While there may be additional graves, and indeed cemeteries, associated with other whaling industry ports along the Strait of Belle Isle, sound evidence of human remains has been limited to Areas L and M on Saddle Island. In 1989, a woollen shirt was located in a water-saturated area northwest of the cemetery, in Area B (see Figure 3-1), within a few metres of a mass of thousands of insect casings. While it has not been verified, Tuck (1989b:3) posits the shirt and insect casings represent a disturbed burial where the garment was removed from the main grave. The shirt is similar in style to one

found at Area M and contributes to some of the best preserved working class garment collections of the sixteenth century (Tuck 1989b:2-3, 2005:26-27). The shirt and insect casings provide possible evidence for additional graves associated with living and work areas outside of the cemetery in Area L.

3.3 Basque Whaling Context

The archaeology in Red Bay corresponds with the archival evidence and demonstrates that the harbour was part of the intensive Spanish Basque whaling trade during the sixteenth century. Barrel parts found on land, in Area B, are identical to specimens recovered in the hold of the *San Juan*, a Spanish Basque galleon that sank in Red Bay in 1565.

Several coins found during land excavations on Saddle Island also confirm Red Bay's involvement in the sixteenth-century whaling industry. Excavations uncovered a silver Philip II coin dating to between 1556 and 1598 in Area A (Tuck 1979: 2) and a French half ecu dated to Henry IV's rule of France and Navarre between 1589 and 1610 in Area E (Tuck 1983:96). The absence of clay pipes on land, or underwater, also supports the theory that this is a sixteenth-century site (Grenier 2007:I:11).

Considering the estimated number of whalers in Red Bay each year, and the hazards of the trade, it is surprising that the Saddle Island cemetery indicates an average death rate of less than one percent per year for the years 1540 to 1600 (Tuck 1986:152). It is unlikely that this is the only cemetery of its kind along this coast considering the hazards

of the occupation and the number of whalers who frequented the Strait through the sixteenth century. Of course, many whalers were likely lost at sea and their bodies never recovered. The remainder of this thesis will examine in detail the cemetery and human remains located on Saddle Island.

Chapter 4 Whaling Populations and Previous Research

Whaling is a dangerous occupation. The sailors who hunted the large mammals from small open boats, flensed and boiled the blubber, constructed casks, and loaded the 400-pound barrels aboard ship were highly skilled and developed specialized techniques that were unparalleled in the whaling industry for centuries. Their skills were so highly regarded that, when larger European nations, such as England and The Netherlands, set their sights on the whale stocks of Norway in the early seventeenth century, they looked to the Basques to teach them how to whale in the dangerous, icy Arctic waters.

The Saddle Island population affords us an opportunity to study a distinct population of known occupation, over a relatively short time frame, and known, or at least suspected, biological affinity. The archaeology at Red Bay has provided a rare glimpse of how a sixteenth-century whaling station operated but little is known about the individuals who lived far from home for eight months of the year, in the inhospitable conditions of a harbour filled with smoking cauldrons of melting blubber and rotting whale carcasses, with everything coated in oil.

This chapter introduces population studies from other known early European whaling sites in the Arctic and discusses their relevance for the Saddle Island study.

4.1 Seventeenth and Eighteenth-Century Whaling

By the early seventeenth century a number of western European nations were competing over the rich whaling grounds in the Barents Sea surrounding Svalbard, an island archipelago in northern Norway located in the Arctic Ocean. The main rivalry over whaling rights and hunting grounds was fought between England's Muscovy Company and The Netherlands' Noordsche Compagnie. Crews were made up of men from many other nations including Germany, Spain, France and the Basque Country (Prestvold 2001:5).

Skilled Basque whalers were essential on the early Svalbard expeditions until the western European nations had mastered the technique for themselves (Conway 1906:42-43; Hacquebord 1994:290, 292-293). Until the mid-seventeenth century, the Basque shore-based whaling technique was the primary method carried out along the coasts of Svalbard. With increasing competition and a growing hunt by 1670 the whales had moved out to the edge of drift ice and whaling was executed from ships in the open sea (Hacquebord 1994:296; Prestvold 2001:6).

While Svalbard is often referred to as Spitsbergen in much of the literature, Spitsbergen is more accurately the largest Norwegian island in the Svalbard archipelago. Several whaling stations and graveyards associated with the whaling period, dating to the seventeenth and eighteenth centuries, were excavated along the northwest coast of Spitsbergen and on smaller islands just off its coast. To date, northwest Svalbard provides the most relevant comparative studies of shore-based whaling operations to Red Bay.

4.2 Biological Anthropology of Seventeenth and Eighteenth-Century Whaling Populations

Dutch, Danish, and Norwegian archaeologists recorded several graveyards along the northwest coast of Svalbard and excavated a portion of only a few of the larger known cemeteries. As of 1999 more than 700 graves had been recorded but some researchers estimate there must have been a few thousand graves associated with the Svalbard whaling period (Sellevold 2000:6). However, only a small sample of those identified have been examined and described. The arctic climate and permafrost conditions afforded good preservation of most of the skeletal and burial materials. Three of these samples are described below and will serve as comparative reference data for the Saddle Island cemetery study.

Berit J. Sellevold (Norwegian Institute of Cultural Heritage Research) examined the skeletal remains of twelve whalers from Liknesset, one of the largest known cemeteries in northwest Svalbard, located on the Vasa peninsula of Spitsbergen.

Sellevold (2000) completed a physical anthropological study of the twelve skeletons and compared the remains with data collected from four known cemeteries in northwest Svalbard, as well as southwest Svalbard and mainland Norway. Sellevold's analysis, discussion and catalogue of results provide a succinct physical description of the skeletal material. She also attempts to determine the biological ancestry of the population and determine whether or not whaling activities left any trace on the skeletons. The majority of the males showed signs of scurvy and many exhibited traces of osteoarthritis,

but only a few showed signs of trauma (Sellevold 2000:10-13). Sellevold provides a small sample of raw comparative data and statistics that will be discussed in Chapter 7.

G.J.R. Maat, of Leiden University, investigated two burial sites containing almost 300 individuals associated with seventeenth- and eighteenth-century whaling enterprises excavated on Ytre Norskøya and Amsterdamøya, both islands off the northwest coast of Spitsbergen. Maat performed extensive studies on a small sample of whalers from each island. His analyses provide general cemetery descriptions, in situ postures and skeletal length, as well as a more detailed physical anthropological analysis of both excavated samples (Maat 1981, 1987).

Maat (1982, 1984, 2004) performed extensive research on the incidence of scurvy and Harris lines (transverse lines that indicate interruptions in growth formation in tubular bones) in the 50 skeletons excavated on Ytre Norskøya. This sample provides the greatest breadth of published osteological data from Svalbard.

The seven whalers excavated at the large whaling station of Smeerenburg on Amsterdamøya were part of the failed Dutch overwintering attempt in 1634-1635. Journal entries provided positive identification of the seven men and the chronological details of their failed winter encampment (Hacquebord 1991). Records of their pain and suffering due to scurvy and hunger allowed Maat a unique opportunity to correlate his own osteological observations to known pathological conditions in the skeletal remains (Maat 1981:189-190, 1987:42).

4.3 Pathological Conditions Associated with Whaling Occupations

Dutch and Danish-Norwegian whalers stationed in the Svalbard during the seventeenth and eighteenth centuries displayed a variety of unhealed wounds of the skull, healed and unhealed fractures, osteoarthritis, deficiency diseases such as scurvy, and anomalies of the vertebrae (Maat 1981:169-185; Sellevold 2000:10-12, 18-19). It is not to say that all the pathological changes in the whaler's bones were related to a whaling lifestyle, but it provides an interesting glance at the health of other whaling populations. Scurvy was a major source of distress (78 percent of buried whalers) for the Dutch on their relatively short voyages through the spring and summer to the Arctic and back. Outbreaks of scurvy occurred at Svalbard after a lapse of seven to eight months from Holland (Maat 1981:172-183, 1982:91).

The Basque whalers at Red Bay may have suffered health problems on a similar scale to Svalbard; however, no positive evidence of scurvy was documented during excavation of the cemetery (Kennedy 1985:6; Tuck 1986:153). Nevertheless, there is one instance of death caused by scurvy suspected from an overwintering in Red Bay in 1576-77 (Tuck and Grenier 1989:56).

Highly skilled harpooners and specialized personnel were sent annually to Red Bay (Table 4-1). Many of these specialists made more than one whaling voyage to Labrador during the sixteenth century. Thrusting harpoons into a whale or furiously changing rowing direction to back away from the angered giants are only two of the activities that could result in overuse or abuse of muscle groups and joints. Loading 1000-2000 casks, each weighing 400 pounds, into the holds of galleons would qualify as

Table 4-1 Crew Composition for a Terranova Whaling Voyage.
Reproduced from Barkham (1981a:56; 2007a:62)

Captain	Owner
Pilot	Mate
Harpooners	Boatswain
Coopers	Carpenter
Whale Flensers	Caulker
Steward	
Chaplain*	
Able Seamen	
Apprentice Seamen	
Apprentices	Pages

* Priests did not accompany every Spanish Basque whaling vessel. A single priest might oversee the crews of two or three ships travelling together and sharing the same harbour in *Terranova* (Barkham 1974:78-79, 2001:114).

strenuous activity (Barkham 1978:10). Ensuring casks were properly assembled and tightly sealed required the coopers to perform intricate and repetitive activities which may have had lasting effects on bones in the hands and arms. The wide swooping motions necessary for stirring the cauldrons of boiling whale blubber for hours on end may have affected shoulder or elbow joints. There are also known osteological correlates for weapon use (Bridges 1990; Stirland 2000; Stirland and Waldron 1997) for those whalers who engaged in defensive warfare against privateers. Mariner activities are known to exhibit activity-related osseous change (During et al. 1994). Most, if not all, men aboard the galleon would serve as mariners during the voyages across the Atlantic. Most of the

above activities engage greater involvement of the upper body, with some lower limb involvement with rowing and other weight bearing impact on the pelvis and legs.

The relationships between bony changes and specific occupations are another matter. It is rarely possible to extrapolate from the general to the particular and assign an individual's occupation from a group study (Dutour 1986; Knüsel et al. 1997; Rogers and Waldron 1995). Differential preservation in the collection also makes it difficult to diagnose the presence of specific bony lesions or to compare them between skeletons. The data will speak for themselves as a valuable description of a rarely seen sixteenth-century whaling population.

4.4 Previous Research on the Saddle Island Cemetery Collection

Brenda V. Kennedy, University of Calgary, was the lead physical anthropologist overseeing the burial excavations on Saddle Island, EkBc-1. Kennedy's doctoral thesis included the Saddle Island human remains (referred to in her thesis as Red Bay) in an isotope study of $\delta^{13}C$ variability between seven Post-Medieval populations. A total of 32 whalers were sampled with 22 useable results, as well as faunal bones (cod, seal, whale, bear, and dog) for comparison from the 16th-century whaling operation (Kennedy 1988:101-102,144). The variation of $\delta^{13}C$ values among individuals from Red Bay ranges from -16.5 to -18.1 and indicates a near equal reliance on terrestrial (46%) and marine (54%) foods. Red Bay showed the highest contribution of marine carbon among the Post-Medieval populations in the study (Kennedy 1988:142, 145-146).

Red Bay also exhibited one of the more varied diets in her study of Post-Medieval populations. It may be expected that a group with a common heritage who originates from a small geographic region of the Basque Country, and shares seasonal employment would exhibit less variability between each other. However, Kennedy attributes the range of $\delta^{13}C$ values between burials at Red Bay to the varying number of seasons each man may have spent whaling along the Strait of Belle Isle consuming foods that greatly differed from their traditional diet, as well as the span of time – almost 100 years – in which the whalers died in Labrador (1988:150-151).

Kennedy's Red Bay sample included individuals from single and multiple occupancy burials. Individuals buried together exhibited similar $\delta^{13}C$ values. Kennedy suggested individuals buried side-by-side with similar isotope values represent whalers who were related, or at least originated from the same community, were also working and occasionally dying together in whaling accidents or a fast-acting outbreak of infectious disease (Kennedy 1988:151).

The rate of collagen turnover is greater in cancellous bones (e.g. ribs) and reflects a more recent dietary history of an individual than a long bone would (Klepinger 1984:75). Approximately half of the Red Bay collagen samples came from rib specimens and, not surprisingly, generally scored higher for marine foods. This lends support to the hypothesis that the Basque whalers availed of the local food resources while in Red Bay (Kennedy 1988:142, 153).

According to faunal data at the site, the whalers had a protein-rich diet available to them while in Labrador which consisted of fish, a large variety of seabirds and marine and terrestrial mammals (Kennedy 1988:103; Tuck and Grenier 1989:54). Personal and ship provision lists suggest Spanish Basques relied heavily on fresh local food while in Labrador (Barkham 1981a:8, 2007a:V:48-49). The protein-rich Labrador diet may have provided better subsistence than at home in the Basque Country; however a protein-rich diet would not guarantee protection of overwintering whalers from deficiency diseases such as scurvy (Tuck 1986:153; see Chapter 7). Considering there may have been upwards of 800-1000 whalers in Red Bay each year and the hazards of the trade it is surprising that the cemetery indicates an average death rate of less than one percent per year for the peak years 1540 to 1600, an estimate that seems unusually low for such a dangerous occupation (Tuck 1986:152). In a 1619 statement Juan de Echevet recalled 540 people dying during the overwintering of several ships in 1576-1577 (Proulx 2007a:I:33), a number which is thought far too high by archivist, Selma Barkham (Huxley 1987:104).

Kennedy also collected bone samples from ten whalers for cortical bone age testing to compare against her gross morphological age techniques. These samples were forwarded to Dr. Susan Pfeiffer, University of Guelph, for histological analysis. Pfeiffer commented that the samples were difficult to prepare and showed signs of decay (micro-organisms), chemical change (discolouration and staining), and physical trauma (cracks). The age estimates between the two techniques differed up to 50 years for the same individual (S. Pfeiffer to B. Kennedy, letter, 13 July 1987, University of Guelph, Guelph) so Kennedy

deemed the histological age estimates "problematic" due to condition of the bone (1988:101). Pfeiffer's results remain unpublished.

Emily Webb (2006), Memorial University, studied cranial asymmetry within and between two populations: a hunter-gatherer population of Newfoundland Maritime Archaic from Port au Choix, Newfoundland, and four colonial-era European skeletal samples. The Saddle Island skeletal collection was one of four early European populations involved in the study and the only 16th-century group. Webb's Masters research was not intended to create a site-specific osteometric description of the Saddle Island crania but rather to include the metric data to develop a set of measurements and a functional interpretive model that could be used to describe cranial asymmetry in any single individual, as well as entire populations (Webb 2006:128).

Webb (2006:153-155) chose specimens with complete or partial crania and mandibles which included 17 individuals from the Saddle Island collection. Apart from a general description of cranial asymmetry within the group of four Colonial-era European populations there were no specific observations made regarding the Saddle Island whalers as a standalone population.

Chapter 5 Materials and Methodology

The Saddle Island cemetery collection is currently stored at The Rooms Provincial Museum Division's Human Remains Repository, located in the Department of Archaeology, Memorial University of Newfoundland, St. John's, Newfoundland and Labrador. This collection provides a unique primary source of historical evidence for a time and industry about which little was previously known.

The archaeology shows that the cemetery is associated with a seasonal, transatlantic, shore-based Basque whaling industry, so it does not reflect a normal sample of an entire population. This collection may be representative of a whaling cemetery during this time, or may prove unique if other contemporaneous whaling cemeteries are discovered and analysed in the future. For now it remains the only known cemetery of early European mariners and whalers living in southern Labrador during the sixteenth century.

This chapter will briefly describe the human remains, artefacts, and burial attributes collected and recorded during excavation, followed by an outline of the methodology used to analyse the skeletons and burial patterns from the Saddle Island cemetery.

5.1 The Excavation and Finds

Excavation on Saddle Island uncovered a total of 63 burial features; 58 located in Area L (1982-1985), and five in Area M (1986) (see Figure 3-1). The burial remains include human bone and teeth, clothing, artefacts and burial containers.

All burial remains were removed for analysis when possible; however, the preservation condition of the majority of burials was considered too poor to be removed from the ground. In these instances samples of bone and teeth were removed. Skeletal samples vary from nearly complete elements, to unidentifiable bone material. In some instances burials were partially or fully block excavated, meaning they were removed with adhering substrate to keep the skeletal remains intact. A number of these block excavations remained untouched prior to this research. In such cases, these remains had to be excavated in the lab, dry-brushed, and cleaned prior to analysis.

Burial measurements and observations were recorded in the field, and preliminary analyses for the skeletons recorded in the field laboratory. Unfortunately, the original burial field notes were never returned to the Province. For this reason, my thesis research and analysis were executed without the aid of burial data forms completed during excavation of the Saddle Island cemetery. Publications (Tuck 1987b, 2005; Tuck and Grenier 1989), annual field reports (Tuck 1983, 1984, 1985, 1986, 1989a) and occasional field note observations (Jefferson 1986, 1987; Red Bay Archaeology Project 1985, 1987) provide limited specifications of burial excavations.

At the time of excavation, each burial was mapped and photographed at maximum depth where complete skeletal remains were observable. In most cases, the maps provide the only available information on observed in situ skeletal remains, and intentional (e.g., clothing or coffin nails) and unintentional (e.g., faunal remains or wood chips) grave inclusions. Burial maps are stored at the Department of Archaeology at Memorial University of Newfoundland in St. John's, Newfoundland and Labrador. Burial photographs were generously provided by Dr. James Tuck.

5.2 Methodology

5.2.1 Burial Practices and Principles of Interment

Kennedy (1988:100) describes the typical burial as a "shallow burial; extended on back with feet together and arms crossed on the pelvis or chest; head to the west; interment in plain ground, generally without the use of a coffin; general absence of grave inclusions, with the exception of occasional remnants of clothing (textile fragments, a few clothing clasps, and a series of lead discs thought to be clothing weights)".

A number of the burials deviate from the typical burial practices described above in a manner that cannot be explained by natural taphonomic factors (Tuck 1986:153). In 1986, six burial features were found outside of the naturally bounded cemetery. These provided the first evidence of intentional grave inclusions (e.g., wooden cross and lance), besides clothing. Most individuals were buried approximately 30 cm below ground, while one individual was interred at a depth of almost 1 m (Tuck 1987b:55, 1989a:220).

Burial patterns are described as single or multiple interments containing up to 13 individuals. In the eastern portion of the cemetery, a number of graves were marked by large rocks placed along the long axis of the graves (Kennedy 1988:100). A few graves contained the remains of coffins, indicated by wood and nail fragments (Tuck 1984:76).

Multiple interments can result from a whaling accident or a fast-acting outbreak of infectious disease. Kennedy (1988:151) suggests that in multiple burials individuals with similar isotope values may represent whalers who were related or who originate from the same community. Status differences may also affect burial practices. Some status differentiation is known from the archival and archaeological records; harpooners were more highly paid than other whalers (Barkham 1979:61), coopers had specific foods allotted according to provisions lists (Barkham 1982:90-95) and cooperages had some of the only luxury artefacts associated with domestic dwellings at Red Bay (Tuck and Grenier 1989:50). The differences observed between all of the burials on Saddle Island may reflect a mixture of Christian burial practice, hasty burials due to abandonment of the site, individuals who died during overwinterings and could not be buried until the ground thawed, status differences, or mode of death. All the evidence, including burial positions, interment patterning and morphological analysis, was analysed to establish if meaningful patterns exist.

Burial maps were analysed to obtain as many details on the location, condition and contents of each individual within each burial. Observations include 27 categories including grave type, shape, occupancy, skeletal position(s), orientation and alignment, and grave associations. Burial data will be discussed in Chapter 6.

5.2.2 Osteology

Osteological analysis involves both observation and measurement. This study recorded all identifiable skeletal material and discrete traits. Various measurements and skeletal indices, cranial and postcranial, were employed to describe the physical picture of the whalers. A variety of measuring tools was employed for analysis, including spreading and sliding callipers, anthropometer, mandibulometer, tape measure and osteometric board. All metric and non-metric data were recorded in a Microsoft Access database. This provided central storage for all information collected from the skeletal material and burial patterns and permitted the data to be easily manipulated for statistical analyses.

5.2.2.1 Number of Individuals

Although most of the burials from Saddle Island are primary interments, and therefore easily countable, there were some instances in multiple burials where individuals were not clearly separated. In order to calculate the number of individuals in a mixed group of skeletons, it was necessary to count both the numbers of the most frequently occurring individual bones and paired bones.

During excavation each of the burials was recorded and, where preservation allowed, the skeletons collected and labelled. Kennedy (1988:100) estimates less than 25 percent of the individuals excavated at the cemetery were removed from the ground for further analysis, which would translate to approximately 35 people. However, the catalogue of the human remains returned to the Province from site EkBc-01 identifies 84

separate individuals. It is possible that more than one catalogue number may have been assigned to a single burial. Multiple burials where there was no clear separation between individual skeletons (e.g. Burial 1) or burials which were poorly preserved can complicate calculating the minimum number of individuals (MNI). The existing catalogue was used as the basis of this study. Where possible, the results of sorting and identification determined which burial numbers match to represent a single individual.

There were also a number of "miscellaneous" or supernumerary bones from known and unknown burials. These were analysed in a separate category.

5.2.2.2 Sex

The documentary resources provide a strong indication that all individuals aboard the whaling vessels were male; "the only people who were automatically left behind [in the Basque Country] were the women" (Barkham 1978:18). Preliminary analysis indicated, insofar as possible, that all of the individuals interred at Red Bay were males (Tuck 1986:152).

The sex of an individual can be determined only if the relevant bones are present and if the individual was older than about 18 years at death. The sex of a skeleton is determined by observing two types of morphological traits. These are referred to as specific and characteristic morphological traits. Specific traits are those considered specific, for biological reasons, to either the male or the female skeleton. An example of this is pelvic morphology. Characteristic traits are those deemed distinctive on either the

male or female skeleton because of physiological differences, resulting in a longer growth period in males. For example, the more pronounced muscle insertion ridges on the male skeleton that result from greater muscle mass are defined as a characteristic trait. The pelvis provides the strongest sexual differences (Rogers and Saunders 1994), while supplementary information can be obtained from the cranium and long bones (Schwartz 1995:277; Ubelaker 1989:52-55; White and Folkens 1991:322-323). Generalizations of "female" and "male" differences are based largely on European material and vary slightly among populations. Previous Basque physical anthropological studies discussed sexual dimorphism in Basque crania (de la Rúa 1985, 1992) and assisted in sex determination. Methods for sex determination were contingent on the state of preservation or damage to specific skeletal structures.

Two individuals exposed in 1984 (Tuck 1985:225) suggest that immature individuals were aboard the whaling ships that came to Red Bay. While the analysis of nuclear DNA can be an independent and reliable technique for sex-determination in immature remains this method was outside the scope of this project.

The remains of each whaler were analysed and assigned to one the following categories: Male, Male? (probable male), Indeterminate, Female? (probable female), or Female.

5.2.2.3 Age

Unlike sexing, the age at death of an individual is easier to determine for individuals under the age of twenty than it is for older individuals. The criteria employed for estimating age at death must be relevant to the maturity of the individual (Ubelaker 1989:63). Dental development, wear patterns on permanent molar teeth (Brothwell 1981), and epiphyseal fusion (Schwartz 1995) provide the most reliable age estimations. Other age-associated changes on the skeleton occur at the pubic symphysis (Brooks and Suchey 1990; Suchey and Brooks 1988; Suchey and Katz 1986), the auricular surface of the ilium (Lovejoy et al. 1985; Meindl and Lovejoy 1989) and at the sternal end of ribs (Iscan et al. 1984a, b).

With the exception of two individuals exposed in 1984 (Tuck 1985:225), all of the skeletons were believed to represent adults aged 20 to 45 years old (Tuck 1986:152). For this study all possible aging techniques and criteria were employed on the Saddle Island material. The results of using various aging methods often give widely differing values. Poor preservation also affects the precision of age determination. Therefore, individuals were assigned to the following age groups: Juvenile (up to age 12), Adolescent (13-18), Young Adult (19-30), Middle Adult (31-40) or Old Adult (41+), unless more reliable age determinations were made.

5.2.2.4 Stature

It is possible to estimate living stature from length measurements of relevant long bones and calculations using regression equations (Ousley 1995, Trotter 1970; Trotter and Gleser 1952, 1958, 1977). The leg bones, particularly the femur and tibia, provide the most accurate estimates of stature (Krogman and Iscan 1986), but all available data were assessed.

According to the limited notes recovered, in situ measurements were recorded for at least some of the burials. In cases where the deceased have been buried in an extended, supine position and their remains are in a fair state of preservation skeletal length has been recommended as an accurate estimate of living stature by Petersen (2005:113) who has expanded on procedure's outlined by Boldsen (1984:309-310). Ideally, skeletal length should be measured in the grave during excavation, measuring along the sagittal plane from a point at the top of the skull to a point at the distal end of the talus (Petersen 2005:107, 113). In lieu of in situ grave measurements, the measurements collected from mapped skeletons during excavation provide both a rough check on calculated statures as well as a general guide for stature estimates of skeletons for which stature calculations cannot be assessed from skeletal material due to poor preservation.

5.2.2.5 Ancestry

Most criteria for determining ancestry are based on non-metric cranial and dental traits (Gill and Rhine 1990; Ubelaker 1989). Non-metric traits can be defined as

"[variations] observed in bones and teeth in the form of differently shaped and sized cusps, roots, tubercles, processes, crests, foramina, articular facets and other similar features" (White and Folkens 1991:332). A predisposition for a trait may be genetic, but the actual appearance and expression of the trait may also result from environmental factors. This study assessed ancestry according to the non-metric criteria set out by Gill and Rhine (1990).

Interment patterns, clothing, artefacts buried with the dead, and preliminary skeletal analyses indicate that the Saddle Island skeletal material represents individuals of European ancestry. Historical documents present a more refined picture, stating the Basques held undisputed sway over the whaling industry in Labrador (Barkham 1980a:70).

5.2.2.6 Pathological Conditions

The health of individuals represented in the cemetery is partly reflected by any evidence of pathology, including diseases of malnutrition, infectious disease, and fractures. Data collection of pathological conditions followed the standards set out by Buikstra and Ubelaker (1994:107-123).

Starvation is unlikely to have been a major cause of death given the abundance of local marine and terrestrial species, including the abundance of whale meat available. The most common pathology expected in such a maritime whaling population forced to overwinter would be scurvy, a vitamin C (ascorbic acid) deficiency caused by a lack of

fresh fruit, vegetables, liver and scurvy grass, in the diet. Scurvy, as observed in seventeenth- and eighteenth-century whaling populations, presents as black stains at dental root tips and in the weight-bearing bones of the lower limbs. Palaeopathological studies completed by Maat (1981, 1982, 1984, 1987, 2004) and Sellevold (2000) provided comparative case studies for this research.

5.2.2.7 Occupational Stress Indicators

Certain skeletal changes develop as a result of habitual activities. Habitual occupational activity may induce changes in the musculoskeletal system as evidenced by clinical studies (Bird 1990). Asymmetric bony changes, unusually developed areas of muscle attachment and bone fractures can result from the overuse of specific muscles and joints and repetitive movements, such as rowing and harpoon thrusting (Merbs 1983). Unusual patterns of bone development (indicated by metric analysis) and pathology will be evaluated for activity-induced trauma.

The study of occupational skeletal markers is a relatively new field of human paleopathology (Dutour 1986; Kennedy 1989; Merbs 1983; Rogers et al. 1987; Stirland 1991). Such skeletal studies include the development of enthesopathies – bony lesions at the site of muscle insertions (Hawkey and Merbs 1995; Józsa et al. 1991; Lai and Lovell 1992), the asymmetric development of paired bones (Stirland 1987) and the attribution of "degenerative change" (Palfi et al. 1993; Palfie and Dutour 1996; Sofaer Derevenski 2000; Stirland and Waldron 1997), particularly in the form of osteoarthritis.

Musculoskeletal stress markers (enthesopathies) refer specifically to a distinct skeletal mark that occurs where a muscle, tendon or ligament inserts into the periosteum and into the underlying bony cortex. Osteon remodelling is stimulated by increased blood flow caused in muscle-, tendon-, and ligament-bone junctions that are regularly subjected to minor stress and develops where there is the greatest muscular activity (Hawkey and Merbs 1995:324). Musculoskeletal stress markers occurring on the upper limbs were examined visually and scored for type and severity according to Hawkey (1988) and Hawkey and Merbs (1995). The characteristics of robusticity, stress lesion and ossification were scored at specific muscle insertion sites and scored on a scale from 0 to 3 for severity (Hawkey 1988:74-86).

Occupational stress is often manifested in the skeleton by unusual patterns of degenerative arthritis. Osteoarthritis is a type of arthritis marked by progressive cartilage deterioration in synovial (freely moving) joints and vertebrae (Thomas 1997:1364). Osteoarthritis, or degenerative joint disease (DJD) as it is sometimes called, is the most common disease to affect joint surfaces in both modern populations and archaeological groups (Ortner 2003; Rogers and Waldron 1995:32, 44). Risk factors include aging, obesity, overuse or abuse of joints as in sports or strenuous occupations, and trauma. Osteoarthritis was scored for severity and type following the standards of Buikstra and Ubelaker (1994:122-3).

Chapter 6 Burial Archaeology and Mortuary Practices

Analysing mortuary patterns in a cemetery has the potential to show us the relationship between the living and the dead and, in the case at Saddle Island, can tell us something about the whalers' cultural identity and religious ideology. This chapter examines how the Basque whalers disposed of their dead, how individual whalers were treated within the cemetery, and whether burial practices differed between burials or if everyone was treated the same.

Cemetery analysis helps researchers determine the sequence of development of a burial ground: how it was established, over what time period it was used and for how long. From such studies we can help estimate how large a living population the cemetery supported, and the social status of the individuals who were laid to rest there. The methods we use to answer these objectives involve comparing characteristics of each grave and skeleton to see if any patterns in spatial distribution emerge from across the cemetery. The following is the list of criteria observed and recorded (where possible) for each burial and individual, from available field maps and photographs. Where some burial terminology has been used interchangeably between researchers in the discipline, I will define each criterion to avoid confusion, relying on Sprague's (2005) reference to "burial terminology" as a guide.

6.1 Recording the Grave

This researcher had no control over procedures for recording the grave in the field. The following burial analysis was conducted almost three decades after the collection was excavated. Only a few field notebooks were available and these refer to a small proportion of the graves. The original individual burial record forms were not available for study. Currently, burial maps yield the greatest amount of available data but the types of information and level of detail were not consistently recorded for every grave and burial. Most maps involve detail of the skeletal remains at "grave level" when the skeletal remains were most completely exposed. Some maps and occasional notes record the initial grave outline, and accidental grave fill inclusions including faunal remains, matrix descriptions (e.g. buried sod), and wood chips, etc.

The inconsistency in data collection between excavators, note taking and map recording therefore provides neither a complete description of each burial, nor the means with which to compare the burials to each other, in regards to some of these descriptors. Field maps and remaining notes (Jefferson 1986, 1987) made occasional reference that certain characteristics were observed in situ but were not recorded – for example, chips of wood or faunal material were sometimes noted but not depicted on the maps – which suggests that some of the burial data collected in the field may be incomplete.

6.2 Burial Method

Burial method describes the process (simple) or processes (compound) in which human remains are disposed. A *simple disposal* is a single method of burial occurring at one moment in time. A *compound disposal* involves two or more reduction stages of disposal that eventually reduces the amount of material to be disposed and may involve transport and dispersal to more than one location, e.g. burial and reburial; or exposure, cremation, and burial (Sprague 2005:29, 59).

The evidence suggests that all burials in the Saddle Island Cemetery are simple burials. Many of the burials were found in a poor state of preservation which may complicate this assertion but in situ organic stains within the graves support the conclusion that most, if not all, individuals were buried as whole individuals. The presence of clothing and position of artefacts within several of the graves also contribute to this conclusion, and will be discussed later in this chapter.

With the exception of Feature 1, the remaining 62 burial features (98 percent) appear to be inhumations where the body, or bodies, was placed at the bottom of a grave pit that was excavated into the ground, or made use of a natural depression or crevice, and then covered with the original grave pit matrix. Feature 1 comprises a multiple burial of individuals disposed in a surface burial feature.

There was no evidence of intentional modification of the deceased prior to burial, such as cremation, mechanical or chemical decomposition. Burials 22, 35, and 43, in addition to the two larger multiple burials, Burial 1 and Feature 1, show evidence for

disturbance or delay between successive burials and this will be discussed later in this chapter (see section 6.6).

If any burials on Saddle Island were subject to any combination of *compound disposal* processes it would be a delay followed by burial. This scenario is suggested in hypotheses that certain burials could represent men who died during overwinterings but were not buried until the ground thawed, when they were then buried en masse (Kennedy 1988:101; Tuck 1983:103; Tuck and Grenier 1989:59-60). Burials that may reflect this scenario include Burial 1 which contains a haphazard placement of individuals. If the individuals were deceased for some time and advancing in decomposition they might have been harder to hold for carefully positioning in the grave.

Feature 1 may reflect the first stage of a compound disposal, in which deceased individuals were temporarily laid on the ground surface until the ground thawed and they could be buried—which never happened. The information garnered from reports and maps is that the individuals were placed intentionally, articulated, and not overlapping.

Burial types include primary, secondary, and disturbed. *Primary* burials are interments for one or more individuals buried at the same time, or if successively, with very little delay. They are most frequently recognized in the ground by their completeness of skeletal remains and maintained articulation. Disturbance within primary burials is limited to internal collapse of decaying soft tissue in multiple burials where the skeletons may be overlapping. *Secondary* burials are interments that have been rearranged, moved (e.g. reburied), or have delayed burial at the present burial site. This

results in a period of time between death and final burial (Andrews and Bello 2006:17). Skeletons in secondary burials often exhibit a loss of elements, repositioning out of anatomical alignment, and occasional evidence of breakage. *Disturbance* of burials is when interments undergo movement as the result of some later [human or animal] activity unrelated to these remains (Andrews and Bello 2006:17). Andrews and Bello (2006) developed a taphonomic index to score skeletal preservation and classify burial types but this index was not used in this study because lack of field observations, variable burial conditions, and poor preservation across the Saddle Island cemetery provided too little information.

The burials on Saddle Island are mostly primary interments. The potential for a secondary interment occurs in Burial 6 where a single coffin (6D) was placed within a grave with five other individuals. The individual buried in the coffin could reflect status within the group of deceased who share the same burial feature, special attention afforded that individual by a family member, or a delayed burial from a death at sea that awaited for landfall to lay to rest.

Several other burials show evidence of a combination of primary interment and disturbance. Burial 22 is an incomplete single burial that appears to have been disturbed during the later interment of Burial 28. Burial 43 suggests the possibility that individual 43A was interred after 43B which caused a disturbance to 43B's skeletal remains.

Outside of the unusual circumstances of the larger burials in Burial 1 and Feature 1, it may not be possible to infer instances where an individual's burial was delayed. For

example, a crewmember who died during the transatlantic voyage to Labrador could have been buried overboard at sea, or placed in a coffin until they reached land for burial ashore. Delaying burial until frozen ground thaws is another possible reason for delayed burial that would leave little archaeological evidence in the grave.

6.3 Distribution of Burial Features

Archaeologists uncovered 58 burial features in Area L and five in Area M (Figure 6-1). While Area M accounts for only eight percent of all burial features these five graves demonstrate improved preservation of non-osseous grave items and some unique burial patterns not seen in the primary cemetery location of Area L. The specifics of how the individuals and graves in Area L and M differ will be detailed in relevant sections of this chapter.

6.4 Burial Placement

Burial placement characterizes how an individual's remains are placed relative to the ground surface; below, on, or above ground surface. Tuck (2005:24-25) summarizes the majority of human burials in Areas L and M as shallow graves, located below a peat layer, in a sandy gravel subsoil, less than 30 cm below ground surface.

Figure 6-1. Map of Saddle Island Cemetery showing 63 burial features associated with the sixteenth-century Basque whaling enterprise in Red Bay, Labrador. The burials on the southern half of this map represent Area L, while the five burials in the northwest corner represent Area M. Textile is depicted in yellowy-green.

Sixty-two burial features hold individuals placed below ground, representing 98 percent of all burial features. They hold the remains of 120 (90.9 percent) individuals in graves that were excavated into the ground, or placed in natural depressions and covered by soil and or rocks.

Feature 1 is the only exception to this pattern. Feature 1 represents the remains of at least 12 individuals who were placed uncovered, on the ground, upon a shallow sixteenth-century midden or earthen living floor (Tuck 1983:102, 1984:74; Tuck and Grenier 1989:60) (Figure 6-2).

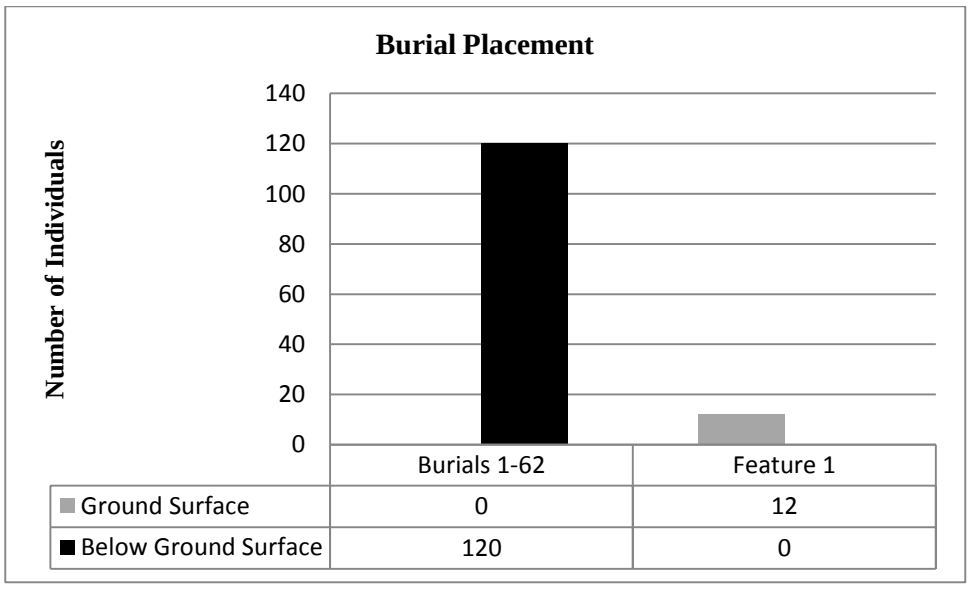


Figure 6-2 Number of individuals placed on and below ground surface.

6.5 Burial Type

Burial type describes how the skeleton was placed in the ground. Burial types encountered in the Saddle Island Cemetery include simple pit interments (excavated and natural), pit interments with a container (coffin) or lined (platform), ground surface, or some combination of these (Figure 6-3).

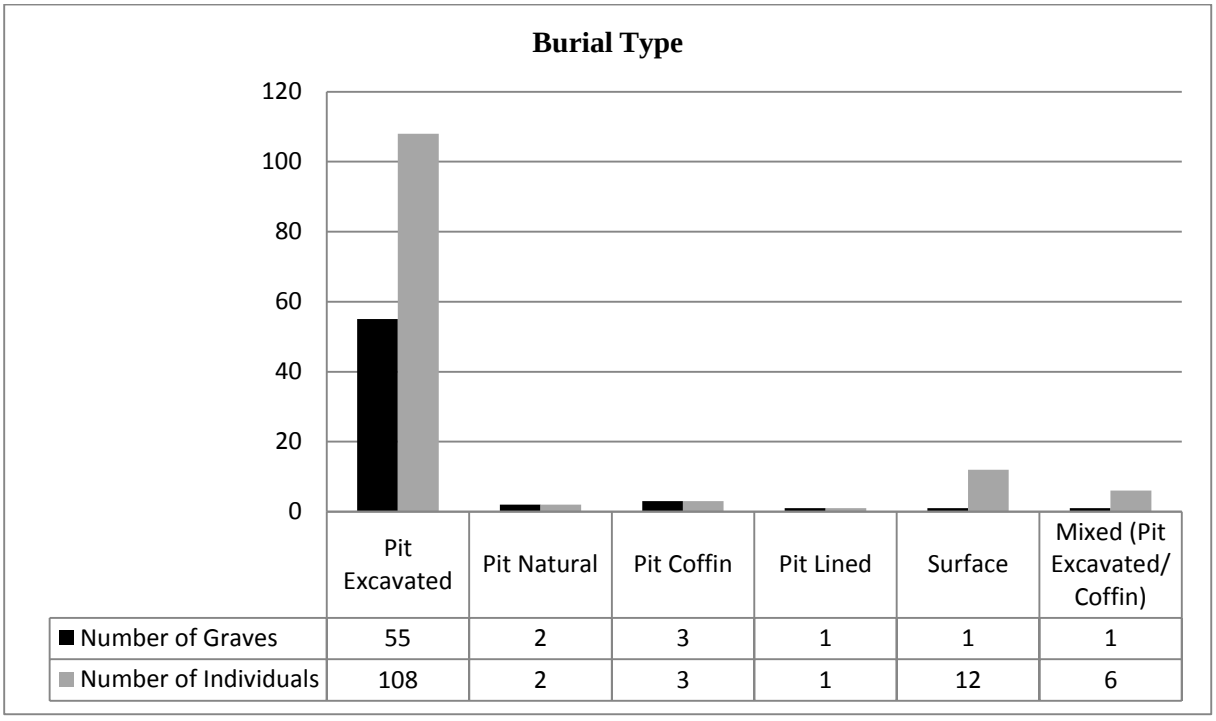


Figure 6-3 Number of graves and individuals buried according to grave type.

6.5.1 Pit Grave

A pit is an interment made into the ground. Instances where burial maps depict grave pit outlines show roughly oval or rectangular-shaped pits with little extra room

between the edge of the grave and the skeletal remains. Photographs indicate a sandy-gravel matrix with numerous rocks and areas of bedrock outcrop that dictate the shape, depth, and orientation of the grave cut. All graves appear to have been dug expediently to accommodate a specific number of deceased person(s) with little or no extra room.

With the exception of one ground surface grave, all interments located on Saddle Island are a variation of pit interments, as they are all made into the ground. For the purposes of classification here only simply excavated and natural pits containing no burial containers or supports are described.

Ninety percent (57/63) of burial features can be defined as pit graves. Fifty-five of those were simply excavated into the ground while the remaining two (Burials 49 and 59) took advantage of natural depressions in the ground, or crevices in rock, and were subsequently filled in with grave fill or rocks to cover or "sink" the human remains.

6.5.2 Coffin Grave

There is evidence for four coffins in the cemetery (Figure 6-4). Three of these are single individuals interred in single occupant graves; Burials 14, 25, and 58 (Plates A-15, A-26, and A-59)[6]. The forth coffin contains one individual, 6D, buried alongside five other individuals within Burial 6 (Plate A-7).

[6] In this thesis plates are labelled with a capital letter followed by a hyphen and number. The letter denotes the appendix to which the plate belongs followed by the number of the plate in that appendix; Plate A-15 is the fifteenth plate in Appendix A.

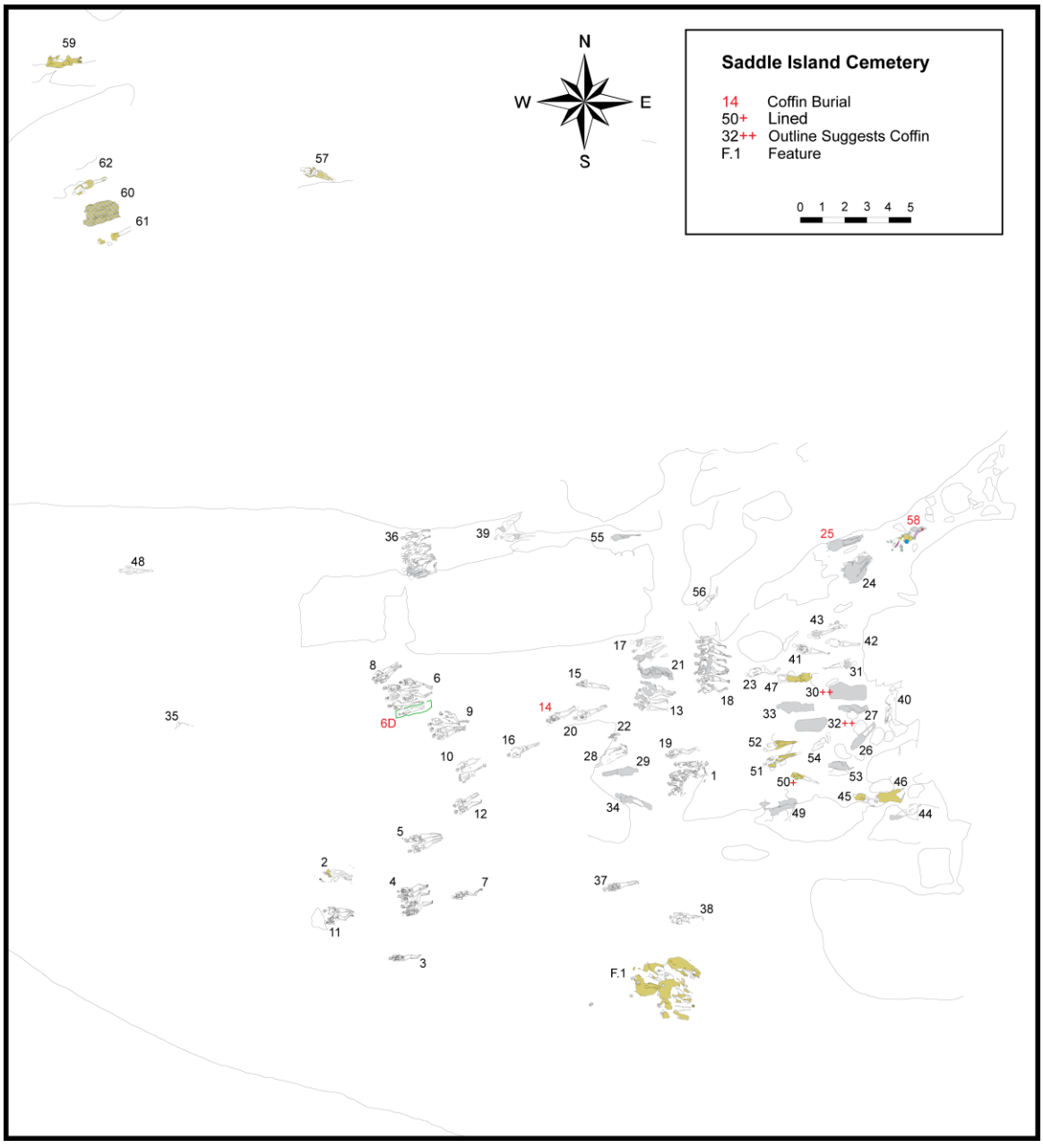


Figure 6-4 Map of Saddle Island cemetery showing locations of coffin and lined burials. The burials on the southern half of this map represent Area L, while the five burials in the northwest corner of the map are in Area M. Textile is depicted in yellowy-green.

Coffins are represented within the cemetery by stains in the burial matrix and strategically positioned nails and wood fragments located near human skeletal remains (Kennedy 1985:3-4). Burial 58 is the only coffin burial with surviving textile involvement but it is limited to an area partially covering the left torso, pelvis and upper thighs, and its function is unknown (Plate A-59).

Burial 6D is the most complete of all four coffin burials. The coffin associated with 6D is represented by wood underlying the skeleton and nails along the perimeter of the wood, as well as wood compressed against the top of Individual 6D's skull and forehead (Figure 6-5).

Figure 6-5 Burial 6, Coffin wood adhering to skull and face of individual 6D.

Two additional graves suggest possible coffin burials according to the roughly rectangular shape of residual organic stains located at grave level in Burial 30 (Plate A-31) and observations of Burial 32 made by Kennedy (1997:2). It is possible the grave outline in Burial 30 could also represent textile involvement but, unfortunately, neither burial offers intact organic preservation nor evidence of nails. In the absence of coffin materials these burials are recorded as excavated pit interments.

There is no apparent pattern to the location of coffins within the cemetery. With so few coffin burials you might expect that these were men who held status amongst the crew, or perhaps they had close friends or family working beside them who took special care in their burial, but they could just as easily have been an ill whaler who requested a coffin burial in his last will and testament. Alternately, a coffin may contain an individual who died aboard the ship en route to Red Bay until the occupant could be buried in the established cemetery on Saddle Island once the ship reached shore.

6.5.3 Lined Grave

One burial in the cemetery exhibits use of a structural support beneath the skeletal remains. Burial 50 (Plate A-51) contains a single individual whose body was resting upon a burial support, or platform, created from barrel parts. The individual's legs were positioned over a barrel head, and the torso and pelvis rested upon barrel staves (Jefferson 1986:11). As there was no evidence of wood found above the skeleton or nails recovered during excavation it was determined the barrel parts were not part of a coffin.

It is unlikely that the barrel parts were used to help transport an individual's remains to the grave, as they are not structurally solid as a disassembled cask. It is possible the barrel components were meant to serve the same purpose that a coffin might, to acknowledge the status or relationship the deceased held amongst his peers by taking extra care by lining the grave. It might be a stretch to assume the barrel components were intended to show an association to the deceased's occupation, such as a cooper or cooper's assistant. If the body was laid on the wood to keep it from freezing to the ground over the winter it might be possible that the boards were then adhered to the individual when it came time to bury in the spring.

6.5.4 Surface Grave

The cemetery contains only one ground surface burial feature. Feature 1 (Plate A-64) is the shallowest inhumation with bone located on the ground surface, overgrown by only 3-5 cm of peat. Feature 1 is unique in many regards and the details of this burial will be discussed in more detail in the succeeding sections describing grave depth, occupancy, alignment, and textiles.

6.5.5 Mixed Grave

Burial 6 is the only interment to exhibit more than one burial type within the same grave. All six individuals were buried together in an excavated pit but only one, 6D, was placed in a coffin prior to burial.

Burial 6 begs the question, why would only one individual be interred in a coffin and laid to rest beside five other men in the same grave? It is possible that 6D was an individual who garnered particular attention among this group of peers. Perhaps the coffin represents the last person to have died during an overwintering, found by whalers returning the following season, and buried in a coffin alongside his fellow overwintering crewmembers who predeceased him and were buried prior to the new ships arrival.

6.6 Grave Shape, Dimensions, and Depth

The graves on Saddle Island appear expedient in construction. The grave shapes and dimensions were dictated by the rocky substrate and limited soil accumulation. Burial photographs exhibit grave pits dug with sloping sides, just big enough to accommodate the individual(s) to be buried (Figure 6-6).

Occasional map and field notes indicate at least four different depth measurements recorded during excavation of the cemetery; minimum depth to grave fill, minimum depth to skeletal material, minimum depth to coffin, and maximum depth of burial feature. All depth measurements were measured in centimeters as depth below surface (DBS).

The absence of burial records leaves little information to go on. The remaining field notes that exist for the cemetery concentrate on excavations during 1985-1986 but are in no way complete. Measurements for only a small sample of burials were noted on maps and in occasional field notes. The notes do not suggest a standardized method of measuring depth in all burials. It appears the measurements were taken at a point

Figure 6-6 Burial 4 at grave level showing the slope of original pit walls and the naturally rocky substrate. Photo courtesy of James A Tuck.

wherever a change of matrix or material was first noted by the observer.

As the only "unburied" feature, Feature 1 is the shallowest interment in the cemetery. A thin peat layer only a few centimeters thick had grown over the deceased in over 400 years (Tuck 2005:25). Burial 25 is also noted as a very shallow grave in which the coffin lid must have been flush with the natural ground surface and soil mounded above to cover the grave (Kennedy 1997:2).

Graves excavated from 1982 to 1984 were described as extremely shallow with less than 20 cm of grave fill covering most individuals (Kennedy 1985:3). By 1986 the average depth to skeletal material was described at 30 cm below surface (Tuck 1987b:55).

Table 6-1 is a summary of measurements for 18 burial features excavated from 1984 to 1986.

Table 6-1 Minimum Depths of Burial Features.

Minimum Depth Below Surface (DBS)	**Burials 2 - 62**	**Burial 1**	**Feature 1**
Grave Fill (11 observations)	Range: 13-33 cm; Mean: 27 cm	Unknown	N/A
Skeletal Material (14 observations)	Range: 20-82 cm; Mean: 42 cm	Unknown	Range: 3-5 cm
Coffin (1 observation)	Range: 23 cm; Mean: 23 cm	N/A	N/A

Mean depth to grave fill is 27 cm DBS. Mean depth to skeletal material is 42 cm DBS but that includes five observations from the burials located in Area M which were generally deeper than those in Area L. If the Area L and M burial data is separated then the mean depth to skeletal material of buried dead in Area L is 29 cm DBS (eight observations), and 43 cm DBS in Area M (five observations). If we ignore the deeper measurements recorded in Area M the average depth to skeletal material in Area L is on par with Tuck's average depth description of 30 cm DBS (2005:25). The "unburied" dead in Feature 1 were not included in the average depth measurements.

The only depth recorded for a coffin was measured to 23 cm DBS in Burial 58. There was no measurement recorded for the grave matrix mounded over Burial 25 other than the description that the coffin lid was found level with the original ground surface.

6.7 Occupancy

Occupancy refers to the number of individuals who occupy the same burial feature. Occupancy was not clear in all instances. This was primarily due to poor preservation of bone. In the absence of burial field notes, only the data contained in maps, photographs, and general site notes can be relied on.

Burial features within the Saddle Island cemetery contained between one and 12 (minimum) individuals with the majority holding between one and four individuals (Table 6-2).

Table 6-2 Burial Feature Occupancy.

Occupancy	Number of Burial Features (/63)	Percentage of Burial Features (%)	Minimum Number of Individuals Represented (/132)
1	42	66.7	42
2	8	12.7	16
3	3	4.7	9
4	5	7.9	20
6	1	1.6	6
7	1	1.6	7
9	1	1.6	9
11 (+)	1	1.6	11 (+)
12 (+)	1	1.6	12 (+)

6.7.1 Single Occupancy Burials

There are 42 single person interments, accounting for 67 percent of all burial features (Figure 6-7). Single burials represent 66 percent (38/58) and 80 percent (4/5) of interments in Area L and Area M, respectively.

Burials 30 and 32 are categorized as single burials. Each is represented only as an organic burial stain with no preservation of intact human bone or teeth. The dimensions of organic staining within each burial would suggest ample room for two individuals, side by side, but in the absence of organic preservation it is impossible to say. These burials were previously mentioned in this manuscript as possible coffin burials.

Figure 6-7 Burial 3 is an example of a single burial. Photo courtesy of James A. Tuck.

6.7.2 Multiple Occupancy Burials

The remaining 21 burial features contain between 2 and 12 (minimum) individuals (Figure 6-8). Multiple occupancy burials represent 33 percent (21/63) of all cemetery interments, including the unburied dead in Feature 1, and contain 68.2 percent of total individuals. Multiple burials correspond to 35 percent (20/58) of interments in Area L, and 20 percent (1/5) in Area M.

Figure 6-8 Burial 9 is a multiple burial containing four individuals. Photo courtesy of James A. Tuck.

Multiple occupancy burials can be divided into two categories: contemporaneous and consecutive. Contemporaneous multiple burials contain individuals that were placed in a single burial feature at the same time. Consecutive multiple burials represent individuals who were placed in a single burial feature over a period of time that may, or may not, have been closed and reopened.

The majority of multiple burials in the cemetery are contemporaneous multiple burials. There are four instances (Burials 1, 6, 36, and Feature 1) that leave some question to the sequence of when and how multiple individuals were laid to rest beside each other in the same grave feature.

Burial 1 (Plate A-2) contains the remains of at least 11 individuals who are positioned more haphazardly than individuals in other burial features. This burial could represent individuals who all died in a relatively short time period, perhaps in a disaster or in an outbreak of disease, and who were crowded into a grave pit that was too small. This might explain the disruption to the pattern of normal burial positions in Burial 1. Alternately, this could represent individuals whose burials were delayed during an overwintering because the ground was still frozen, then were all buried together as soon as a grave could be dug in the spring. Burial 1 will be discussed further as a possible mass grave in the next section of this chapter.

Burial 6 contains six individuals, one of whom is contained in a coffin (6D) while the remaining five were not (Plate A-7). The unusual circumstances of this coffin burial were discussed in an earlier section (6.5.2) in this chapter where it was suggested the

coffin might represent an individual who died in advance of the others, perhaps near the end of their trans-Atlantic crossing, and was buried alongside others who died subsequently.

The crowding of nine individuals in Burial 36 (Plate A-37) might be explained by similar reasoning as described above for Burial 1; however, it is more likely attributed to bedrock outcrops bordering the burial to the north and south and larger rocks found within the grave pit. Many broken bones on the map are located around larger rocks that may have caused the bones to roll after decomposition, or may have been broken by overlying rocks as the grave fill settled. These natural obstructions may have prevented Burial 36 individuals being positioned in strict adherence to the Christian burial practices observed across most of the cemetery.

Feature 1 contains the remains of at least twelve individuals positioned close together on the floor of a temporary structure (Figure 6-9; Plate A-64). The individuals in Feature 1 do not exhibit the degree of overlapping observed in Burial 1 and lay roughly parallel to each other in two north-south rows. The one exception is the incomplete skull (Feature 1L) located just west of the main feature concentration which this study interprets as disturbance by a small mammal, perhaps, as the condition of the bone fragments do not show signs of scavenging. There are some gaps in the southern extent of the burial feature that could accommodate another individual, near Feature 1J.

The best understanding of the unburied individuals in Feature 1 is these individuals died while the ground was still frozen during a tragic overwintering.

Survivors would have placed the deceased in a temporary location, such as the floor of a living shelter, hoping with the arrival of spring thaw and new crews of whalers the dead would be placed in a final grave (Tuck 2005:25). At the same time, these men may not have been afforded a final burial if the rest of the crew became too weak over the winter and succumbed to their own illnesses. If this happened during a year near the end of the Basque whaling enterprise in the late sixteenth century there would have been no new crews to find and bury the dead (Tuck 1984:75). However, why there was no attempt at sending a rescue ship the following season is a mystery. You might even expect the crews who still returned for cod fishing would have attended these men's proper burial.

Figure 6-9 Feature 1 is a multiple grave containing a minimum of twelve individuals. Photo courtesy of James A. Tuck.

Burial 43 (Plate A-44) will be discussed in the upcoming section on burial disturbance, but the disproportionate degrees of preservation and articulation between individuals 43A and 43B suggest this was a multiple-consecutive burial, albeit accidental. If the grave pit for 43A was excavated into 43B, thereby disturbing the latter's remains, perhaps Burial 43 would be more accurately interpreted as two single burials, rather than one double occupancy burial. Due to lack of excavation notes on how to interpret this burial feature it will remain a double burial.

6.7.3 Multiple vs. Mass Grave

Sprague (2005:74) defines a multiple grave as a burial containing more than one articulated individual, and a mass grave containing more than one disarticulated individual or only articulated fragments of their partial remains. While these definitions indicate that neither need be arranged in a particular manner, neatly aligned, or haphazard, the Saddle Island cemetery tends to exhibit multiple graves with skeletons neatly aligned, and the mass grave less so.

It was not immediately obvious whether Burial 1 was a poorly preserved multiple burial containing at least eleven individuals, haphazardly arranged with visible skulls adhering loosely to the westward direction, or if it should be interpreted as a mass burial. It is difficult to determine if Burial 1 should be classified as a disorderly multiple occupancy burial that appears disarticulated because of poor preservation, or if the overlapping of individuals, chaotic arrangement, and poor preservation actually represent

disarticulated remains. This study will interpret Burial 1 as a mass grave because it stands out from the other graves due to an increased incidence of crowding and haphazard placement of individuals overlapping one another (Figure 6-10). According to map details, the pattern of disarticulation or missing skeletal elements may better reflect poor preservation, than if the individuals skeletons were disarticulated as might be expected from dismantled primary graves that were dug up and reburied (Plate A-2).

Figure 6-10 Burial 1 is a mass grave containing a minimum of eleven individuals. Photo courtesy of James A. Tuck.

Natural obstruction may have also influenced the crowding of individuals. The grave cut along the northern extent of the burial pit appears quite straight, almost as if there was something obstructing or defining the burial pit, perhaps a bedrock outcrop.

This burial feature exhibits a sense of urgency and weakened care in the interment of this group of individuals.

6.7.4 Disturbance

A couple of exceptions suggest that some burials (Burials 22, 35, and 43) may have been disturbed during the excavation of later burials.

Burial 22 is an incomplete burial represented by tightly flexed legs that appears to have been disturbed by the succeeding interment of Burial 28 (Plates A-23, A-29). The long bone(s) and mandible assigned as "spare parts" in the field to a possible forth individual, 28D, more likely belong to the upper body of Burial 22 (Kennedy 1997:3); concluding Burial 28 as a triple burial, and not a quadruple, as originally thought.

Burial 35 (Plate A-36) is a fragmentary burial located in sparsely populated area of the cemetery along the western limits of Area L. The femur and innominate fragments were found in an area that is known by local residents as the 'potato garden' (Kennedy 1997:3) which may help to explain the incompleteness of the burial.

Burial 43 (Plate A-44) is described as a double burial containing the fragmentary remains of the individual 43B near the lower legs of 43A, a nearly complete, extended individual. The dissimilarity in preservation between these individuals might be explained by natural mechanical processes or, alternately, as the result of one burial disturbing another due to crowding along the tightly packed eastern portion of Area L.

Just south of Burial 43 in adjacent Burial 42 crews uncovered a single burial with an extra long bone positioned across the skull (Plate A-43). If 43B represents a disturbed grave then it is possible the extra element in Burial 42 could be part of the disturbed remains of 43B. Unfortunately the poorly preserved remains and 'indiscernible organic stain[s]' described on the Burial 43 field map prevent a clear understanding of the sequence of interment and subsequent taphonomic processes affecting Burial 43. Burial 43 will remain a double burial in this thesis though it is possible individual 43B represents a single burial disturbed by the later interment of 43A.

6.8 Burial Orientation and Alignment

There are many factors that can influence how an individual is positioned in, or on, the ground. Studies of orientation and alignment have been reviewed in mortuary studies that include sex, age, social status, manner of death, state of guilt or innocence, religious customs, natural features, position relative to structures, shoreline, other graves or bodies when multiple graves are dug (Rahtz 1978:2-3). The orientation of the first grave can influence where subsequent adjacent graves are placed.

Orientation uses one direction to describe the position of one end of an individual, the head or the feet, for example. Alignment uses two directions to describe how an individual, container, and grave is positioned (Sprague 2005:31). Orientation was recorded by observing the predominant head-to and foot-to directions for each individual. Alignment was measured from head-to-foot, as well as head-to-sacrum in instances where

feet were either missing or legs were flexed. Orientation of the head and feet, or sacrum, was measured using a protractor and ruler, and measured to the closest degree (°) from north, as designated on the burial maps.

Grave alignment could be described if there was a corresponding map or photograph depicting the grave or grave fill outline. In burials where no human remains were recovered but a grave outline was defined, the orientation of the grave outline was measured. The master grid established over Saddle Island in 1978 was set up to align with Magnetic North; approximately 27 degrees west of True North.

Orientation does not appear to have been measured in the field. Measuring orientation from the burial maps also includes potential for error since slight shifting from the original position of the bones may occur while the body decomposes and the grave soil settles. Head and foot orientations were measured from the location of the sacrum (Sprague 2005:30-32), as represented by burial map. In the absence of a defined sacrum and as long as there was some definition of a vertebral column and pelvic girdle, orientation was recorded. Orientation was measured in a straight line from the sacrum to the middle of the skull (or neck if the skull was incomplete or out of alignment), and in a straight line to a midpoint between the feet.

6.8.1 Head Orientation

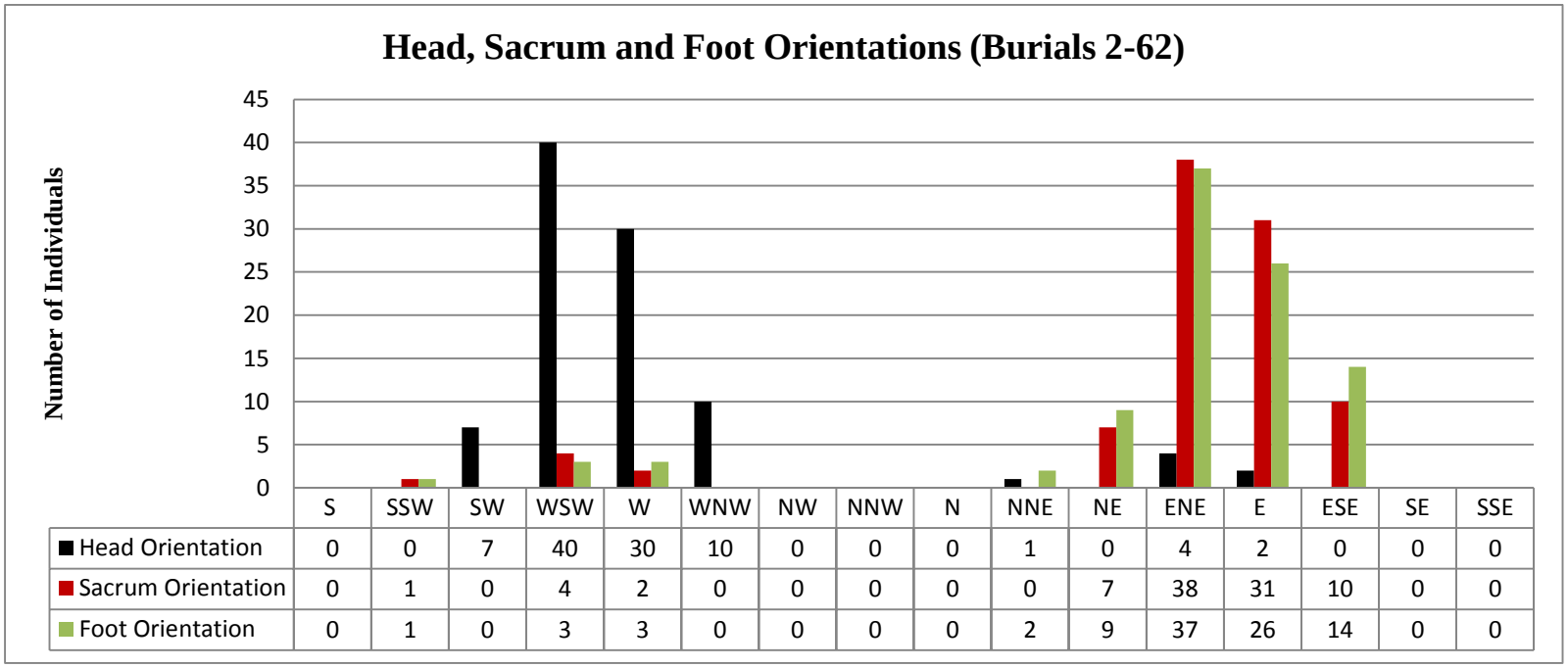
Individuals' head-to position was determined from head-to-foot burial alignment, not head-to-sacrum, which occasionally did not match. Differences between these two

orientations would occur in instances where the body was placed to align west-east but the legs had to be angled differently in order to fit the body around rocks or an adjacent individual.

Outside of the two largest burial features (Burial 1 and Feature 1), 94 of the remaining 109 individual's head-to directions were measurable. The majority of individuals were placed with their heads to the WSW (40/94, 42.6 percent) and west (30/94, 31.9 percent) directions for a total of 70/94, or 74.5 percent. In fact, 85.1 percent of individuals have heads within 34 degrees of west (80/94) which falls within WSW, W, WNW (Figures 6-11 and 6-12).

6.8.2 Foot Orientation

The orientation of individuals' feet was also measured for 95 of the 109 observable individuals. Burial 1 and Feature 1 were also omitted from this observation. The majority of individuals were placed with their feet to the ENE (37/95, 38.9 percent) and east (26/95, 27.4 percent) for a total of 63/95, or 66.3 percent. Individuals with feet oriented within 34 degrees of east (77/95) represent 81.1 percent of individuals in Burials 2-62 (Figures 6-11 and 6-12).



	S	SSW	SW	WSW	W	WNW	NW	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE
Head Orientation	0	0	7	40	30	10	0	0	0	1	0	4	2	0	0	0
Sacrum Orientation	0	1	0	4	2	0	0	0	0	0	7	38	31	10	0	0
Foot Orientation	0	1	0	3	3	0	0	0	0	2	9	37	26	14	0	0

Figure 6-11 Head, sacrum and foot orientations among individuals in Burials 2-62.

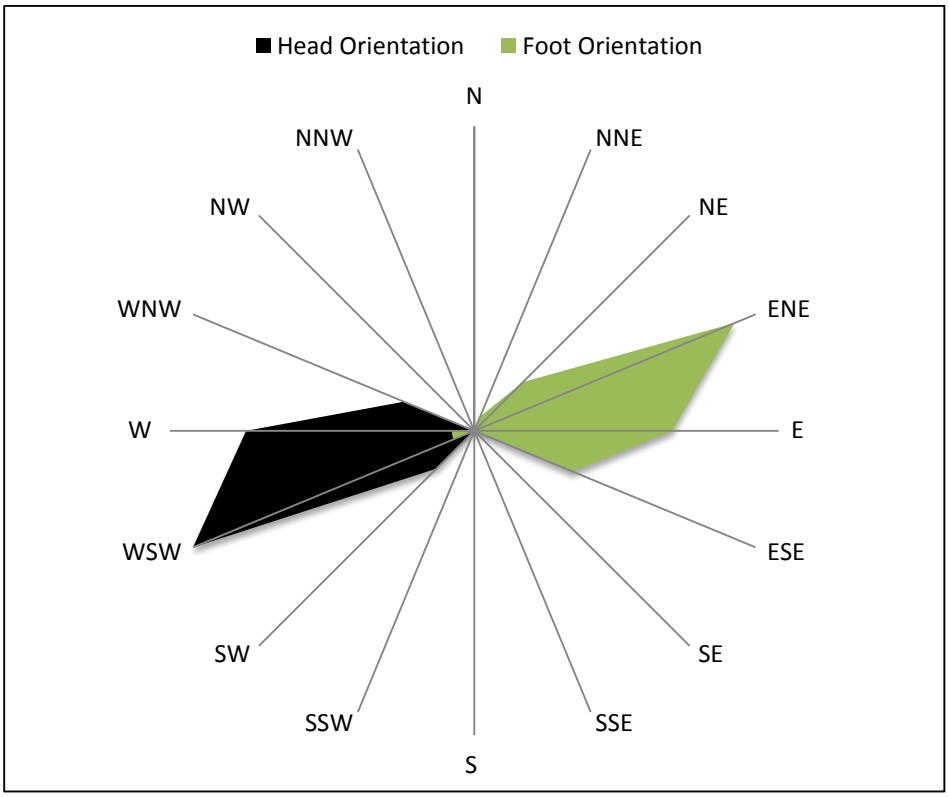


Figure 6-12 Head-to-Foot alignment of individuals in Burials 2-62 (92 observations).

6.8.3 Sacrum Orientation

Orientation of the sacrum relative to the head helps to describe the alignment of the torso regardless of how the legs may be flexed in burial. Sacral orientation was measured for 93 of a total of 109 individuals in Burials 2-62.

The results of sacral orientation were very similar to the same measurements observed with the feet. Almost 75 percent of observable individuals were placed with their sacrum oriented ENE (38/93, 40.9 percent) and east (31/93, 33.3 percent). Similar

to foot orientation, 84.9 percent of individuals have sacrum oriented within 34 degrees of east (79/93) which falls within ENE, E, and ESE (Figures 6-11 and 6-13).

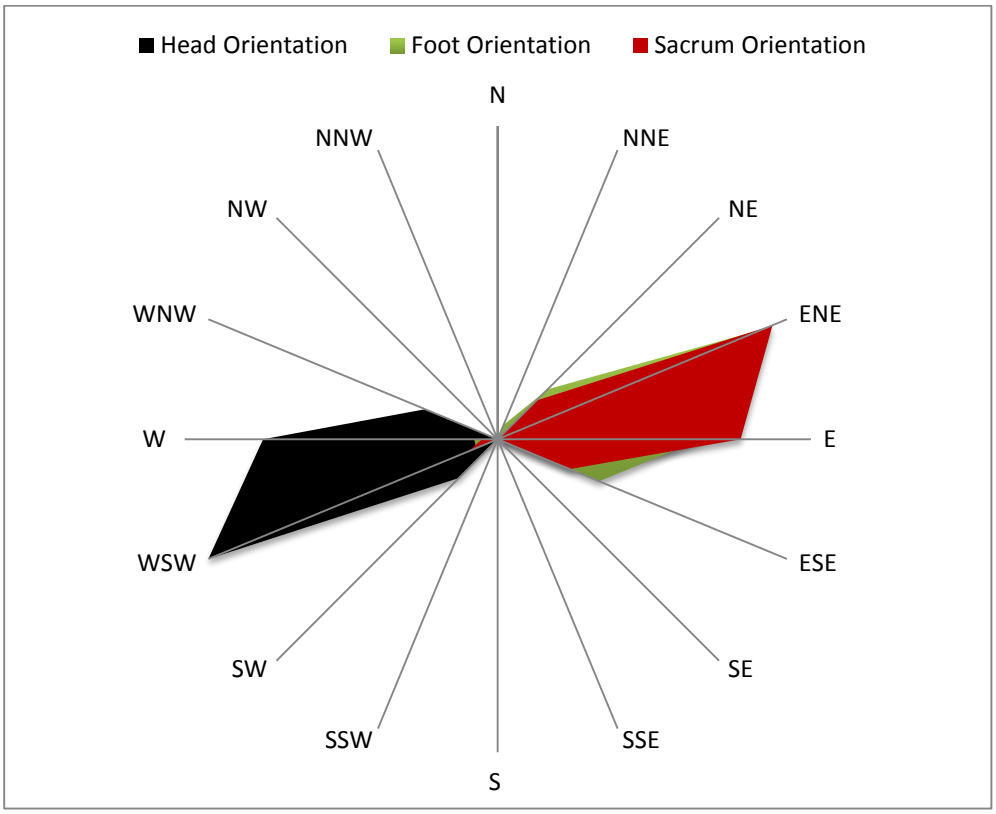


Figure 6-13 Head-to-Foot vs. Head-to-Sacrum alignment in Burials 2-62.

6.8.4 Skeletal Alignment

Two azimuth measurements were compared to describe skeletal alignment of individuals in Burials 2-62. The head-to-foot and head-to-sacrum body alignment azimuths for individuals that could be measured involved 92 and 93, of a total of 109

individuals, respectively. The dominant pattern is head to the west and feet to the east with a slight WSW-ENE bias (Figure 6-13).

Deviations from the above directions for position and alignment are found in burials where skeletons are placed approximately 180 degrees from "normal". Six individuals were aligned heads to the east or ENE and feet, or sacrum, to the west or WSW. In addition, one individual in Feature 1 was aligned ESE-WNW. Burial 60 is the only grave affected in Area M. Individuals 28C, 60B, and Feature 1D originate from multiple burials where they were aligned with their heads towards the feet of individuals in the same grave. There is a pragmatism to alternating the alignment of individuals side by side within the same grave to accommodate more individuals than it would otherwise fit. But that explanation doesn't hold for the four single burials with heads opposite to the predominant Christian burial alignment in the rest of the cemetery (29, 31, 44, and 47). Three instances occur in the eastern extent of Area L, two are beside each other and also include grave markers (31, 47), and so this reverse alignment cannot be dismissed simply as a common treatment to non-Christians, for example, that they were alongside individuals buried the "normal" way. Burial 44 is located in the southeast corner of Area L but is surrounded by other unmarked graves. Burial 29 is centrally located in Area L and beside the reverse aligned individual in Burial 28. It may be a coincidence that these individuals were laid to rest next to each other.

Skeletal alignment in the two largest interments, Burial 1 and Feature 1, reflect a similar pattern to the rest of the cemetery. Individuals in Burial 1 were interred in a roughly west-east alignment; the grave itself was oriented WSW-ENE. Body flexure and

overlapping skeletal remains made it difficult to assign limbs to specific individuals. Maps suggest the head-to-sacrum alignments for seven out of eleven individuals are WSW-ENE (4/7 observations) and west-east (3/7 observations). There was no evidence to suggest any individual was buried in a reverse alignment to the others.

Feature 1 individuals were loosely aligned west-east with a bias to WNW-ENE (8/10 observations), with the exception of individual Feature 1D who was aligned ESE-WNW. We might expect the alignment and positions of Feature 1 individuals to be influenced by the orientation of the structure in which they were abandoned but it doesn't explain why one individual would solely be placed opposite to all other individuals. There was a lot of textile clothing recovered from Feature 1 individuals, so if the head and feet were fully covered during transport of the Feature 1D it might be possible the head and feet were mistakenly reversed when the bodies were aligned.

What do we know about the aberrant group of individuals who were aligned outside of the normal? These individuals appear in single and multiple interments and are represented in both Areas L and M. Three of the seven individuals are located towards the eastern edge of Area L but they are buried near individuals aligned in the dominant "Christian" alignment. That this was most certainly a consecrated cemetery it is unexpected that individuals would be buried outside the head to the west custom, unless these instances were simply the result of expedient burials. The specific burial depths for four of the seven individuals are unknown (28C, 29, 31, 47) but if the depth of earth covering bedrock was shallower towards the western extent of these burial pits it would have made it easier to place the feet towards the west for a better fit. Again, it is possible

that these individuals were wrapped in some sort of covering while they were delayed burial and when it came time to bury these individuals the head and foot ends were reversed by accident.

Tuck (1985:225) attributes most variances from the normal burial position of head to the west as a result of natural obstacles encountered when digging the grave, such as bedrock outcrops, though in several instances there was no apparent reason for breaking with adherence to the west. If we look to the whaling cemeteries in Svalbard during the seventeenth and eighteenth centuries, Maat (1981:154, 163) describes several cemeteries at Amsterdamøya and Ytre Norskøya with graves aligned in rows from north to south with heads to the west. As with Saddle Island, there were burials that demonstrated occasional deviations due to "local obstructions" or nearby features, such as the coastline. There was an example of a multiple burial containing seven overwintering whalers, each buried in their own coffin, where one individual was laid reverse to the others with his head to the east (Maat 1981:155-163).

6.9 Burial Deposition

A body may be deposited in a grave or container in a number of positions, including on the back, face down, on the right or left side, or in a sitting or standing position (Sprague 2005:31). The resting position, or deposition, of observable individuals from map data is illustrated in Figure 6-14 and shows that 92.3 percent (96/104 observations) of Saddle Island individuals were placed on their back.

Variations to the dominant trend occurred in multi-person graves where individuals were positioned on their sides to accommodate all bodies in a single grave, or where the angle of underlying bedrock caused the body to shift.

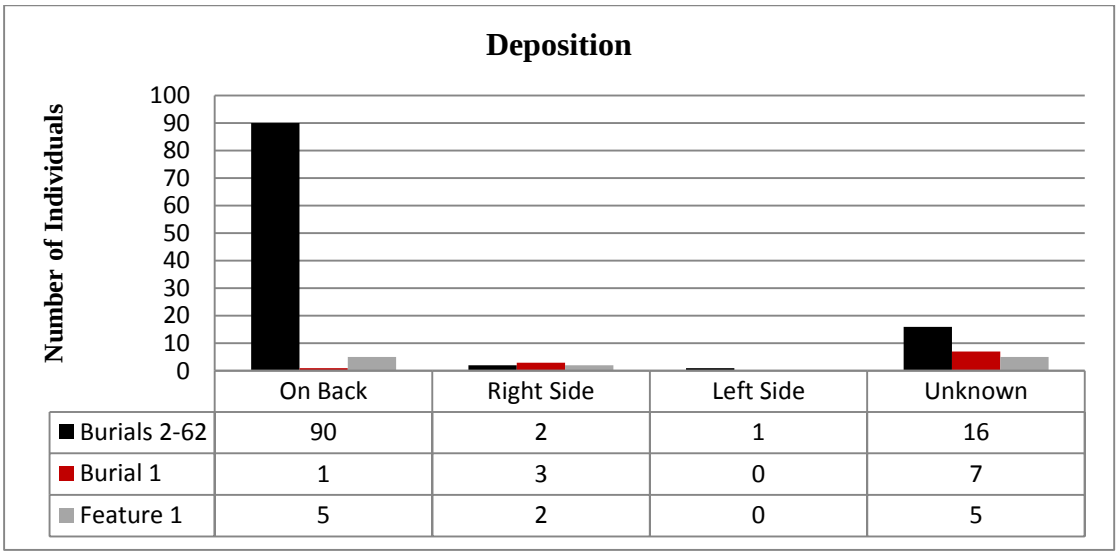


Figure 6-14 The resting position of individuals from Burials 1-62 and Feature 1 (104/132 observations)

6.10 Burial Position

Burial position refers to the relationship of body parts to each other and describes the flexure and position of the limbs of the deceased (Sprague 2005:29). Areas of the body used to describe the position of each individual are flexure at the hips, flexure at the knees, position of the arms and hands, position of the ankles and feet, and the direction the head was looking in relation to the torso. All observations were taken from burial maps, and supplemented with photographs and notes, as they were available.

6.10.1 Flexure

The position of each individual was assessed according to the degree of flexure at the hip between the torso and thigh (spine and femora), and at the knees (femur to tibia and fibula) in order to attribute the degree of flexure in each of these joints; extended (180°), semi-flexed (180°-90°), flexed (90°-10°), or tightly flexed (10°-0°) (Sprague 1968:481, 2005:30).

6.10.1.1 Body Flexure

Body flexure describes the overall flexion of an individual's torso, thigh and knee. Almost two-thirds of observable individuals were buried in an extended flexure position (65.2 percent). The remaining third are individuals in semi-flexed burial positions which were primarily dictated by grave crowding and underlying substrate (Figure 6-15).

Two individuals fell outside this pattern and were flexed in the grave; one in Burial 1 and the other in Burial 22. The mass burial, Burial 1, holds the only complete flexed individual (1A) in the cemetery whose position was likely dictated by the urgency reflected by the haphazard deposition of individuals in Burial 1. Unfortunately, the single individual in Burial 22 is incomplete and represented only by legs with some possible remains relocated to a subsequent grave when Burial 28 disturbed Burial 22.

Kennedy (1997:5) suggests the flexure of Burial 22's legs may be attributed to an area of unconsecrated ground within the cemetery. Modern Basque cemeteries often set aside an area of unconsecrated ground for those who died in a socially unacceptable way,

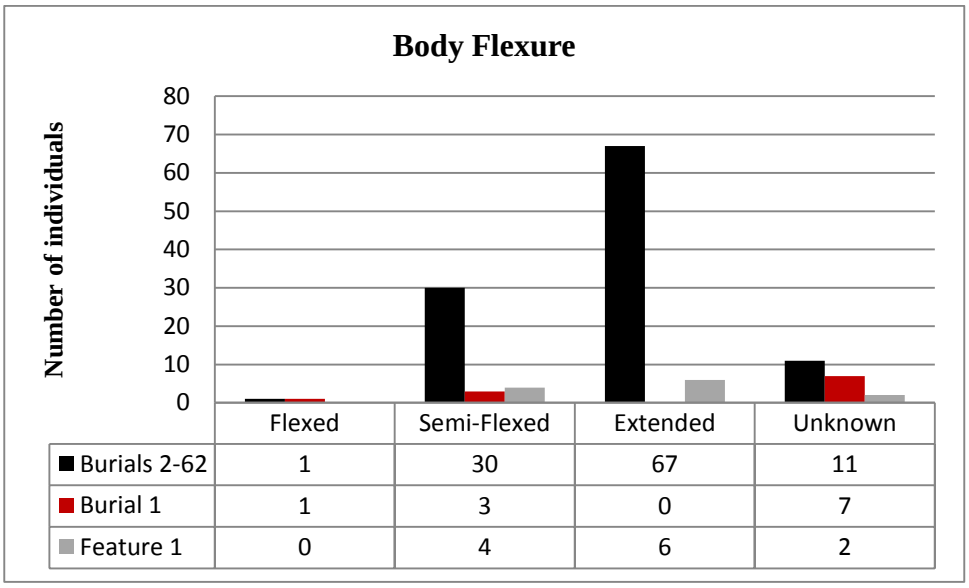


Figure 6-15 Overall flexure position of skeletons in Burials 1-62 and Feature 1 (112/132 observations). Note: A skeleton was considered "extended" overall if one leg was extended and the second leg was semi-flexed only to accommodate crossing the legs.

such as suicide or murder, or for individuals with different religious beliefs (i.e. non-Christians) (Douglas 1969:72-75). If the sixteenth-century Basque cemetery on Saddle Island followed similar tradition, it is possible the burial position of individuals buried inside and outside the consecrated area of the cemetery was not treated the same. Burial 22 is located just north of two burials containing individuals with heads oriented to the east (Burial 28C and 29) but all of these burials are centrally located within Area L (Figure 6-1). It does not make sense to place an area of unconsecrated ground in the middle of a consecrated cemetery, unless these individuals were buried at a time when these graves represented the outer limits of the consecrated cemetery during its early use.

6.10.2 Hip Flexure

Most individuals are predominantly extended through their torso to thigh, 60.7 percent, while the remainder are semi-flexed, 38.3 percent (Figure 6-16). The only anomaly observed is the flexed individual in Burial 1(A).

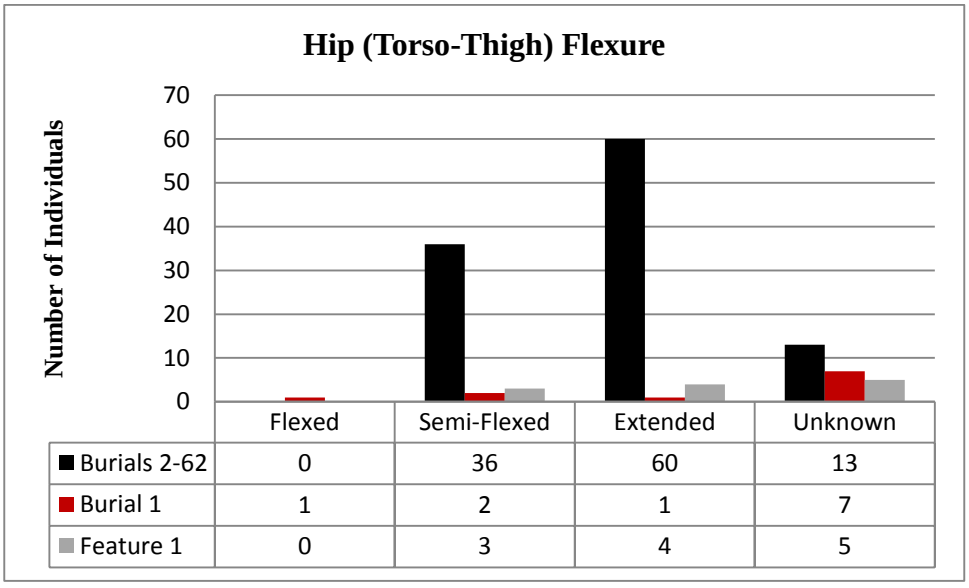


Figure 6-16 Hip flexure of individuals in Burials 1-62 and Feature 1 (107/132 observations).

6.10.3 Knee Flexure

Most individuals had extended knees, 62.6 percent (Figure 6-17). Once knees begin to flex they either fall to the left or right, whether positioned intentionally or naturally. Individuals with semi-flexed knees (18.7 percent) were equally bent to the right and left, while flexed knees (6.5 percent) fell predominantly to the right side. Just over 12.1 percent of all observed individuals showed mixed flexion between both knees.

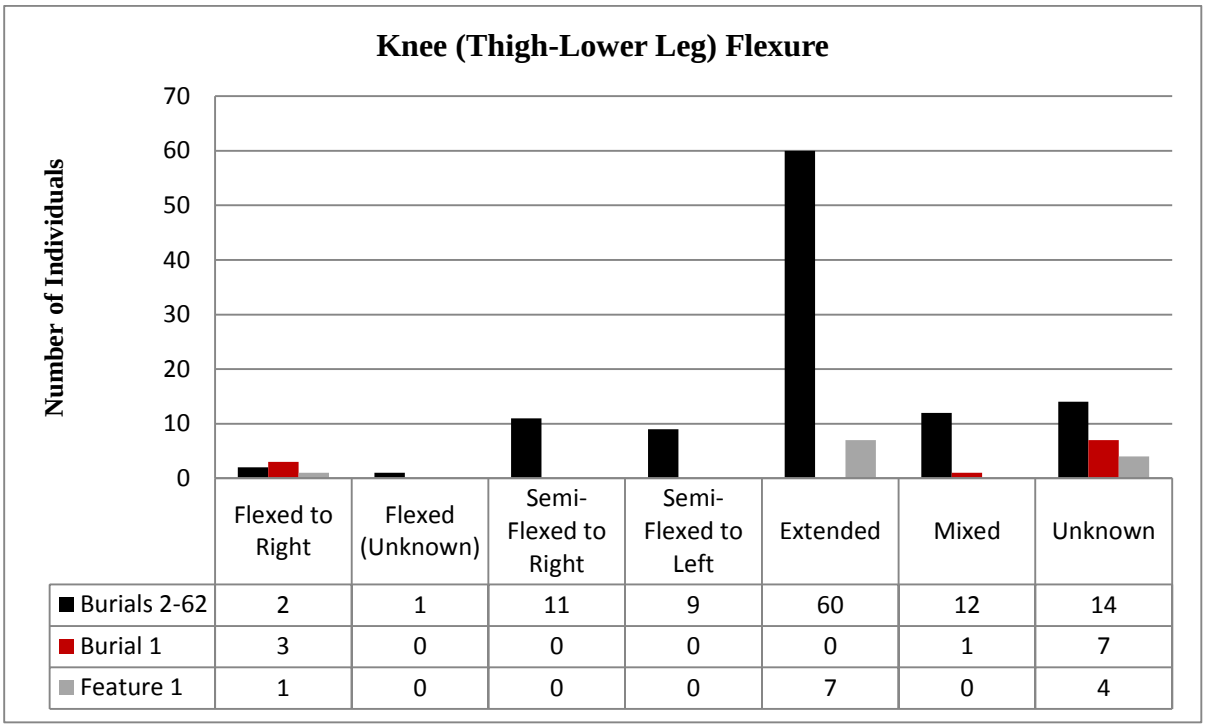


Figure 6-17 Knee flexure of individuals in Burials 1-62 and Feature 1 (107/132 observations).

6.10.4 Arm Position

It seems the living took time to position the dead in their burials according to custom. Almost all individuals had their hands, or wrists, positioned over the pelvis or waist (79.7 percent). Hands placed over the chest accounts for an additional 12.7 percent of observations (Figure 6-18).

Poor preservation prevented more thorough observations from burial maps but where it was possible to determine how the hands were placed on the body crossing the right hand over the left was more common (12/14 observations).

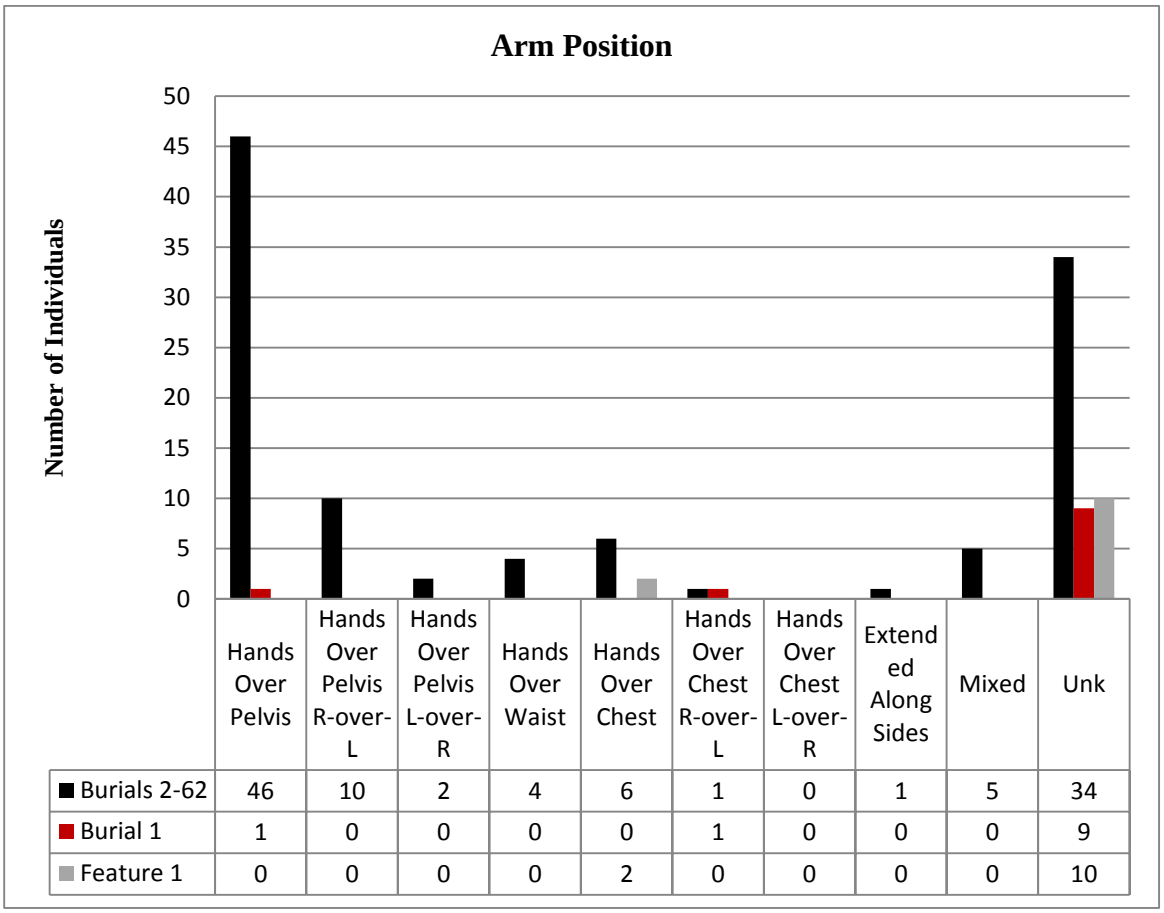
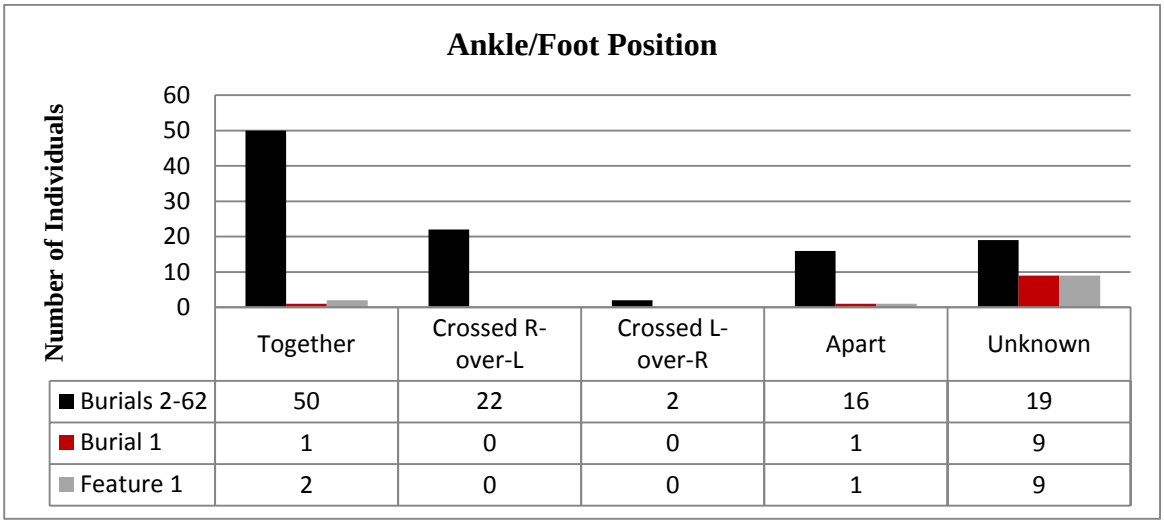


Figure 6-18 Position of arms of individuals in Burials 1-62 and Feature 1 (79/132 observations).

6.10.5 Ankle/Foot Position

Burial maps show over eighty percent of individuals were laid to rest with ankles and feet placed together or crossed one over the other. Similar to the hands, when ankles or feet were crossed right-over-left was most common (22/24 observations). The incidence of crossed feet may be greater than represented in Figure 6-19, as it is likely some of the observations recorded as ankles "together" may actually reflect individuals

with crossed feet where the foot bones did not preserve. Skeletons with legs apart represent 18.9 percent of individuals studied from maps.



	Together	Crossed R-over-L	Crossed L-over-R	Apart	Unknown
Burials 2-62	50	22	2	16	19
Burial 1	1	0	0	1	9
Feature 1	2	0	0	1	9

Figure 6-19 Position of ankles or feet of individuals in Burials 1-62 and Feature 1 (95/132 observations).

6.10.6 Head Facing Position

Funerary studies also examine rotation of the skull to determine direction the head was "facing". Directions include straightforward, rotated (right or left), lateral (ear to right or left shoulder), perpendicular (tipped back or forward), or haphazard (Sprague 2005:30). Only thirty percent of individuals head facing direction could be identified from burial maps. In the Saddle Island cemetery it does not appear that skulls were intentionally placed in a particular compass direction, rather most likely facing straightforward (upwards), and the heads rolling into their discovered position during burial (Figure 6-20). Mechanisms of infilling of space due to decomposition of soft tissue

and resettling of burial matrix overburden adjust head position over time. Individuals buried in coffins are affected by the empty space inside a container, as well as any additional constraints a burial container may put on a skeleton (Duday 2006:35-36, 43-44).

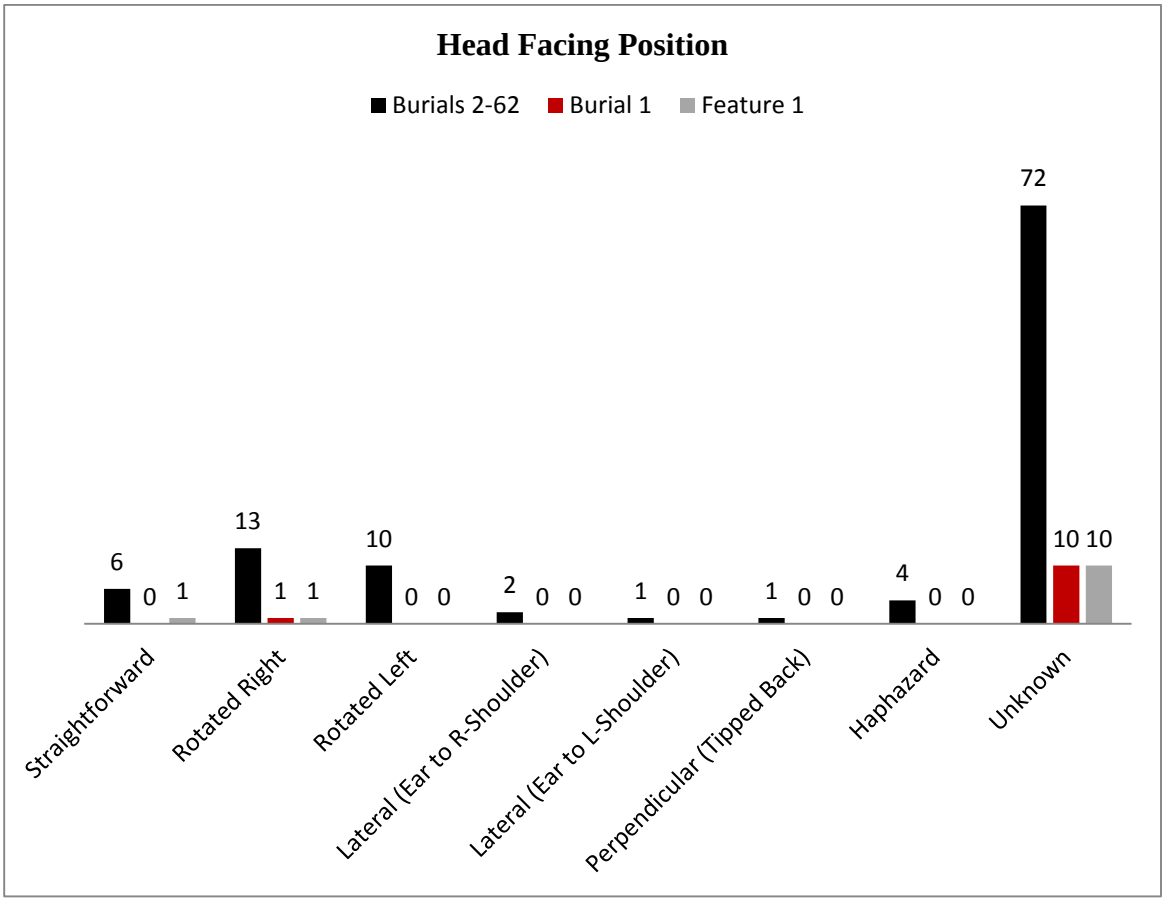


Figure 6-20 Number of individuals in various head-facing positions in Burials 1-62 and Feature 1 (40/132 observations).

6.11 Bone Recovery Success

Bone recovery success is a measurement that grades the success of whether or not human remains could be excavated and removed from the grave for analyses. Success of recovery was determined by presence/absence of human remains, field tags included with the remains, as well as occasional field notes (1985-1986). There are three levels of bone recovery recorded during excavation; complete, sampled-reburied, and recorded-reburied. Complete bone recovery success means all human remains that could be removed from the grave were removed from the grave. Bone recovery success, however, is not a measurement of bone condition or bone preservation. For example, it is possible for an individual to have 'complete' bone recovery success but poor bone condition and only 25 percent bone preservation.

All burials were excavated by hand using a trowel. Occasionally burials were removed en bloc to keep fragile human skeletal remains, artefacts, and textiles together for transport, radiography, and excavation in the laboratory. A variety of methods was used to remove partial or complete skeletons.

Sampled-reburied recovery indicates that human remains were represented with very little solid skeletal material in the grave. Sometimes the organic material was so soft it could not be removed. In other cases the bone and teeth would begin to desiccate upon exposure. In such cases, bones and teeth were represented by an organic stain in the burial matrix, or as bone splinters and dust. Bone and tooth samples were removed during excavation, prior to reburial of organics that could not be removed.

Recorded-reburied recognizes grave features with the least successful recovery of data. In such instances the skeleton was represented by trace human remains in the form of an organic outline or stain within (and often barely discernible in) the burial matrix. Remains found in extremely poor states of preservation were not sampled or removed during excavation. Once all possible observations were recorded and documented the remains were reburied with a lens of clean sifted sand and shell (Tuck 1985:225).

Table 6-2 Recovery Success of Human Remains from Burial Context.

Recovery Success	No. Individuals; (%)	Breakdown		
Complete	49; (37.1%)	24; (18.2%) complete	25; (18.9%) fragmentary	--
Sampled-Reburied	56; (42.4%)	31; (23.5%) bone sample	9; (6.8%) tooth sample	16; (12.1%) bone and tooth sample
Recorded-Reburied	27; (20.5%)	27; (20.5%)	--	--
	132; (100%)			

Data from positive burial features were evaluated for recovery success, totaling 132 individual observations (Table 6-3). Skeletal remains representing 105 individuals (79.5 percent) were removed from the cemetery for analysis; 49 (37.1 percent) excavated fully, and 56 (42.4 percent) sampled only.

Staff from the Canadian Conservation Institute worked closely with archaeologists in the field to recover as much skeletal material from the cemetery as possible. However,

limited remote field location services, time constraints, and unique skeletal finds prevented extensive conservation treatment in the field. Some of the more degraded skeletons were recorded and left in the ground.

Skeletal conditions varied between burials, and conservation techniques were evaluated on a case-by-case basis. While the size of the cemetery was unknown and burial conditions varied, field conservation measures changed over the course of excavations. Research plans for future analysis also affected decisions and methodologies to consolidate the skeletal material. With few exceptions, skulls, long bones, and innominates were consolidated, while vertebrae and ribs were left untouched. Types of consolidants used on bones and teeth include Rhoplex AC-33 (acrylic emulsion) and Bulldog Grip 20-minute adhesive (polyvinyl acetate emulsion). Microcrystalline wax was applied to some teeth in the field, including Feature 1 (Logan 1983:1-8). Occasionally, experimental conservation measures were attempted with disastrous results as observed with PEG 400 immersion of elements of Burials 28A-C and 37.

Material that looked very stable in situ became further degraded and brittle as the elements dried, with cortical surfaces beginning to split and curl not very long after excavation. The skeletal remains were sensitive to humidity changes during drying, transport, and storage, resulting in drying, dampness, and a few incidents of mould growth requiring further post-field attention. Logan developed a conservation strategy in 1983 to more completely consolidate the bones upon their arrival in Calgary (Logan 1983:2-3), however; the complete results of this strategy are unknown.

In order to reinforce burials with delicate textile involvement excavators used adhesive-soaked gauze (Burial 46). When burials associated with intentional grave inclusions were encountered in Area M in 1986 dry ice was used to freeze the human skeletal remains and associated intentional grave inclusions together for block lifting (Burials 57 and 60A-C). Applying a layer of aluminum foil and foaming polyurethane to the outside of the frozen block provided shockproof padding for transport to CCI in Ottawa. The dry ice froze the human remains and associated grave inclusions in the burial matrix from Area M in 1986 so that they could be radiographed (Logan and Tuck 1986:173) and carefully excavated in the lab. Burials containing complicated textile involvement were removed en bloc with the support of adhesive-soaked gauze (Tuck 1985:226).

Auto body filler was occasionally used to remove partial or complete skeletons. Auto body filler sets rapidly and provides a strong support, and was preferred over plaster of Paris because it was much lighter than the plaster (Tuck 1983:102). Individuals 2A, 2B, and 6D were removed in this fashion.

Remains found in extremely poor states of preservation were not sampled or removed during excavation. Once all possible observations were recorded and documented the remains were reburied with a lens of clean sifted sand and shell (Tuck 1985:225).

6.12 Articulation

Sprague (2005:29) defines articulation as the degree to which a skeleton is in anatomical order. Articulation is graded here from most to least; articulated, semi-articulated, disarticulated, and disturbed. The observations in this study are meant to describe how articulated the skeleton was at the time of burial. Field notes and photographs were referenced where available to determine articulation.

Reasonably poor organic preservation made this a difficult post-excavation exercise and many burials are recorded here as "unknown" articulation because it was unclear from map and photo documentation. Ninety-six percent of individuals that could be evaluated with some certainty were articulated (Figure 6-21).

It is suspected that the majority of individuals in Feature 1 are articulated but heavy textile involvement prevented clear interpretation. The synchronous decay of overlapping bodies in multiple and mass burials resulted in commingled remains that further complicated analysis.

Three individuals reflect post-depositional disturbance and were discussed earlier in this chapter; Burials 22, 35, and 43B (Plates A-23, A-36, and A-44). Burials 22 and 35 are only represented by an incomplete lower body, and Burial 43B appears as disturbed or commingled remains near the lower legs and feet of individual 43A, with a possible long bone preserved over the skull of an individual in adjacent Burial 42 (Plate A-43).

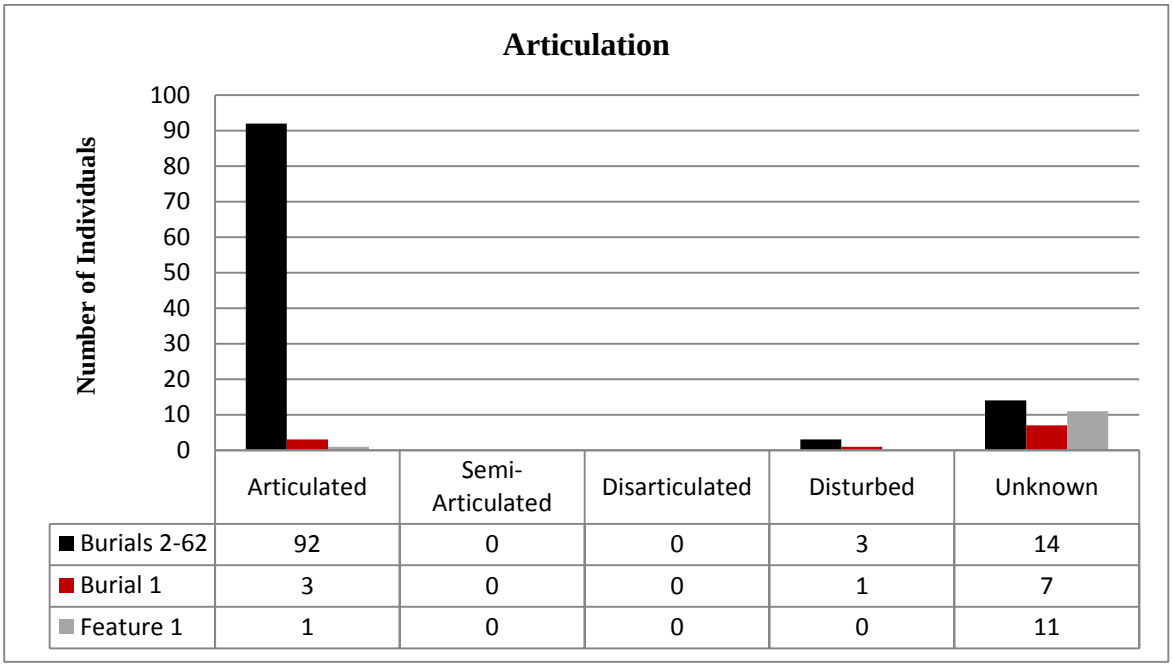


Figure 6-21 Skeletal articulation of individuals in Burials 2-62 and Feature 1 (100/132 observations).

6.13 Grave Associations and Inclusions

6.13.1 Grave Markers

A number of graves had large rocks placed at ground surface. These rocks were arranged in lines or clustered in groupings of one to fourteen and were identified in the field as "grave markers". Burials mapped with stone grave markers were primarily located at the eastern extent of Area L, and in Area M (Figure 6-22). These stones marked 22 percent (13/58) of graves in Area L: 26, 27, 30, 31, 32, 33, 41, 42, 43A-B, 47, 54, 55, and 58; and 80 percent (4/5) of graves in Area M: 59; 60A-C, 61, and 62 (see Appendix A for corresponding individual burial maps).

Figure 6-22 Map of Saddle Island cemetery showing grave marker rocks (orange) above burial features and grave pit outlines. Textile represented in yellowy-green.

Grave marker data are not considered to be complete, or conclusive, for all burial features in the cemetery. Most of the grave marker data appear on two larger "grave marker" maps for Area L and on individual burial maps for graves in Area M, but there were some omissions and possible errors. Field notes mention two burials that were not illustrated with grave markers on the cemetery map: Burial 36's location is described "under a mass of rocks", and Burial 52 with "rocks west of individual". Burial 52 also contained evidence for a possible wooden cross represented by nails and a vertical piece of wood which, if correct, would make this the only non-stone grave marker in the cemetery.

Some additional issues arose from the mapped location of grave marker stones in Area L. The area map is the only reference found for Burial 54 grave markers where none was previously noted for that burial. There are also a number of burials where the grave marker rocks do not overlay any skeletal remains. In some cases these place the grave markers slightly out of alignment with the skeletal remains; Burials 26, 40, 43, and 52. In other instances, rocks between burials make it difficult to attribute which grave the rocks are marking, or if some rocks were intended to mark a general area rather than a single grave, for example, between Burials 32 and 33; Burials 26, 27, and 40; and Burials 24 and 43. In densely occupied areas, most of the ground may have appeared disturbed from multiple grave pits and it is possible once the rocks were placed above the grave fill they did not align with the skeletal remains beneath.

Of course, the rocks designated as "grave markers" could have been placed to deter scavengers from disturbing the graves, as suggested by Tuck and Grenier (1989:58).

If so, this deterrent was limited to the eastern extent of Area L, and Area M. It is possible that the burials with grave markers were shallower than those unmarked in Area L, but the burials marked in Area M were some of the deepest burials in the entire cemetery. Perhaps it is simple enough that the graves marked the most densely populated area of the cemetery at the eastern edge of Area L, and the outermost limit in Area M. One could argue whether the grave markers over Burial 59 are grave markers at all, since rocks were likely necessary to weigh the body down in this boggy area of Area M. The adjacent three graves in Area M (Burials 60A-C, 61, and 62) may have been buried within a short time of each other.

The majority of burial features with grave markers are single occupancy burials; 92% in Area L, and 75% in Area M. The densely packed burials in the eastern extent of Area L may represent a period when the living were afforded enough time to bury their colleagues in individual graves and mark their burials with stones. The attention given to burying the dead can be affected by the amount of time between deaths of individuals, or the season in which they died, as well as the relationship of the living to the deceased.

6.13.2 Metal (Lead) Discs

Several burials contain a round or oval lead disc located on or just below the knee. The lead discs were flattened and perforated with 12 to 100 holes across the surface of each disc. With one exception, the remaining six individuals had a single lead disc located on or near the upper tibia or fibula within 10 cm of the knee (Tuck 1984:76).

Lead discs were sometimes found associated with textile but there was no evidence indicating if, or how, these discs may have attached to the clothing. Perforations were noted in at least one instance to go "from back to front", where the "back" was the side found against the bone (Logan 1983-85:2) while other discs were ground to remove the roughened puncture surface. The true function of the lead discs is unknown but their location near the knee suggests it may have acted as a weight to keep an overcoat or cape from blowing open with the wind (Tuck 1984:76; Tuck and Grenier 1989:62).

Burials that contain lead discs include 6E, 10B, 12B, 13C, 14, 16, and 46 (see Plates A-7, A-11, A-13, A-14, and A-17). The metal disc in Burial 46 was recovered from under textile removed from the burial, and as a result was not mapped. This was the only disc described to be located above the knee and concealed within textile near the left thigh (Kennedy 1997:3). Given the near complete absence of human remains in Burial 46 complicated by folds within the damaged textile it is unclear if this was the original location of the disc.

Four lead discs are located in multiple burials (6E, 10B, 12B, and 13C), and the remaining three from single occupant burials (14, 16, and 46). All lead discs were located within Area L. Only two individuals with lead discs had textile also associated with the burials (16 and 46) but this observation may be skewed by differential preservation across the cemetery.

The disc recorded in Burial 14 (Kennedy 1985:4, 1997:2) is not identified in any photographs or maps. A summary count of discs given by Tuck (1984:76) in his 1983 field season report and the subsequent find of a lead disc in Burial 46 in 1984 support evidence for a seventh lead disc found in association with human skeletal remains. Reference to an eighth lead disc was found adjacent to the cemetery but was not found in association with a burial (Kennedy 1985:4).

6.13.3 Textile

Leather and textile preserved in association with 20.5 percent (27/132) of individuals across 145 burial features, represent almost a quarter all burials in the cemetery (2A-B, 16, 45, 46, 47, 50, 51, 52, 57, 58, 59, 60A-C, 61, 62, and Feature 1A-I, and K). There doesn't appear to be evidence of bindings at the hands or feet, and most identifiable weaves and patterns are identified as clothing. The fabric is predominantly wool and many of the pieces were analysed by CCI conservators and identified to specific function (Dubuc 1988, 2002; Williams 1992). Leather is specifically referenced with individuals 59, 60A-C, and Feature 1G and 1H, and primarily identified as shoes, in addition to a possible leather pouch in Burial 60 (Williams 1992:2-5).

The bog where Burial 59 was found helped to preserve one of the most complete costumes recovered on Saddle Island (Figure 6-23, Plate A-47). The costume includes a shirt, jacket, leggings or socks, leather shoes, and a knit cap. The waterlogged

environment also aided preservation of fingernails and hair, possibly from a beard or the head.

Figure 6-23 Textile costume recovered from Burial 59, Area M, includes knitted hat, wool shirt, jacket breeches, stockings, and leather shoes. Photo courtesy of James A. Tuck.

Burial 60 includes the remains of three individuals with associated textiles. Individuals 60A and 60B wore near complete costumes over much of their bodies, while

the only clothing identified with 60C were the shoes. Larger pieces of textile were wrapped in and around areas of all three individuals (Plate A-61). It is possible the larger pieces of textile were used as a burial shroud; to wrap and carry the individuals until they could be interred. An anomaly noted during conservation was a knot in the sleeve of 60A's shirt or jacket (Williams 1992:16). The report did not elaborate on whether the knot was within the grain of the fabric or if the knot closed a hole in the sleeve, or if the sleeve itself was knotted. Some smaller pieces of textile and leather were associated with two concentrations of iron artefacts and may have served as storage pouches. The only other non-human fibre recovered from Burial 60 was wrapped around the haft of a knife and identified as possible horse hair (Williams 1992:8).

The textile in Feature 1 was intimately associated with the bone. Analysis revealed several weaves and weights of cloth, including seams, and at least one small iron eyelet, which demonstrates the likelihood of clothing rather than burial shroud or collapsed tent materials (Logan 2000:2; Tuck 1983:101-102). All other burial textiles suggest clothing garments, as well.

In places where people die far from their permanent residence it is not unusual for their personal items to be reused or sold, in this case to other crewmembers. Christian burial practices would leave individuals somewhat clothed but outerwear and personal belongings were removed for reuse by fellow whalers, or sale and compensation for the deceased families, as evidenced in the will recorded (Barkham 1976, 1977a; Barkham 1981a:50).

6.13.4 Miscellaneous Clothing Notions

Field reports acknowledge a number of metal closures associated with clothing garments found within burials (Tuck 1983:102, 1984:76; Williams 1992:8) but missing burial notes prevent this study to elaborate on final quantities and style of many of these artefacts, nor permit us to attribute the artefact to a specific burial.

The few pieces of clothing notions recovered with specific reference to individuals were identified on maps and notes; a possible clasp on individual 5B, a possible garment closure made of tinned iron in Burial 60, and a buckle and eyelet from Feature 1A (Plates A-6, A-61, and A-64).

If the metal discs described in the previous section are proven to be textile-related weights then those graves containing metal discs should be added to the list of burial features representing clothing involvement.

6.13.5 Knives and Lances

A lance or dagger was excavated from Burial 59 (Plate A-60), and at least four knives were identified with the three individuals in Burial 60 (Williams 1992).

The iron lance-like object in Burial 59 was discovered below the chest region after the textile, finger and toe nails, and hair remains were removed. Jefferson (1986:106) notes that a 2.54 cm hole was identified in the front of Burial 59's jacket and shirt upon cleaning the textile. Without further evidence it is impossible to determine whether the

lance-like object was responsible for the holes in the garments or if it was responsible for any injury that may have resulted in this individual's death. The interment method for this burial feature is also unique as it was located in what was originally thought to be a well due to the amount of water collecting between bedrock outcroppings. It appears the body was covered mostly by large rocks as there was probably little opportunity for soil accumulation with steady draining of water over the bedrock. The weight of the rocks may have also been necessary to prevent Burial 59 from shifting and to keep the remains covered.

Burial 60 contained more than a dozen metal artefacts and represents the burial feature with the most non-clothing related personal items. Individuals 60A, 60B, and 60C were buried with four knives and an additional two blade fragments. The burial was removed en bloc in the field and shipped to CCI laboratories where the remains were x-rayed and excavated. Despite conservation efforts the condition of the artefacts is such that they are almost unrecognizable without the observations made by CCI staff from x-rays taken prior to their removal from textile. Unfortunately, the conservation report did not further specify which artefacts belonged to which individual (Williams 1992) but some excavation details are provided in Appendix A (Plate A-61).

6.13.6 Miscellaneous Personal Items

In addition to the textiles, garment closure, iron knives, and blade fragments noted in previous sections, the three individuals in Burial 60 were buried with three iron keys,

three nails, two copper alloy fragments, and two unidentified iron fragments. Some of these items were found together with associated textile leather indicating at least two pouches; a leather pouch containing a single key, and a fabric pouch holding a key, three nails, and two copper alloy lace ends (Williams 1992:2-13).

Why the knives and keys would be buried with these men is unclear. The keys would most likely unlock the chests each man would have taken along to Terranova containing his personal belongings (Barkham 1981a:10-11, 24-28). The knives could surely have found use with new owners. One possible suggestion for why so many personal items came to be buried with Burial 60 is the individuals were interred in a state of advanced decomposition such that it was unpleasant for those burying them to search their clothing looking for personal effects. If these individuals died as a result of an outbreak of disease or an overwintering it may explain the large piece(s) of textile used to wrap around all three individuals. Perhaps the textile was a temporary covering while proper burial was delayed.

6.13.7 Intentional Grave Offerings

Most of the items found with skeletal remains can be considered personal belongings. The only object(s) clearly considered a grave offering to the deceased is the wooden cross placed on the chest of the individual in Burial 57 (Figure 6-24, Plate A-58). The wooden cross in conjunction with a cloak-like garment suggests this individual may have held special status, such as one of the priests known to accompany the Spanish

Basque whaling crews to Terranova during the sixteenth century (Barkham 2001:114). The poorly preserved and degraded remains of Burial 57 offers no other evidence to support this conjecture (Tuck 1989a:221).

Figure 6-24 Wooden cross laid upon the chest of Burial 57, Area M. Photo courtesy of James A. Tuck.

6.13.8 Grave Fill Artefacts

There are several materials that were frequently encountered in and around graves that were accidental inclusions in grave fill and sometimes located at grave level alongside skeletal remains. The artefacts in this category include lead shot, faunal remains, wood chips, and roof tile fragments.

The wood chips were mentioned frequently in the limited burial notes available. It is reasonable that small chips of wood littered most of the ground surface of Saddle Island as the result of constant construction and repair to tryworks and barrels. The few fragments of roof tile reflect broken clay roof tiles from the many temporary Basque structures identified on the island.

6.13.8.1 Lead Shot

The only of evidence of ammunition found within the cemetery was a single piece of lead shot located in Burial 62. The depth of the lead shot, at the top of grave fill at the same level as grave marker rocks, is not strong evidence for direct association with the human remains (Jefferson 1986:120). Burial 62 did not exhibit evidence of any wounds in keeping with a lead shot wound.

6.13.8.2 Faunal Remains

The faunal remains located in the burials appear to be purely accidental and unintentional grave fill inclusions. For this reason, faunal remains encountered in grave matrix were not always mapped but they were almost always collected. Field notes occasionally mention faunal remains encountered in overlying stratum or grave fill. Maps and notes indicate faunal remains were encountered in 18 burial features.

It is difficult to say if similar observations were recorded for all burials and how much inter-observer variability occurred between excavators. Faunal remains recorded on burial maps in Appendix A are not identified to species but include, bird, seal, and whale (bone and baleen).

6.14 Discussion

In general, burials imply a proprietary link to land and cemeteries follow a certain plan. Often they are located near a place of worship; the limits are usually demarcated by a fence, or otherwise, and the first burials are usually interred in a clear "corner" or other "beginning point" (Ashmore and Geller 2005:84).

The burial type, alignment, flexure, and positions on Saddle Island are all indicative of Christian burial practice. Sixteen-century Spanish Basque merchants and mariners were deeply religious and supporting their church was important (Barkham 2001). Religion was a vital component of Spanish Basque life and it guided the way they lived and worked together in Labrador and influenced the way they treated each other.

Ships were regularly called after saints, merchants and shipowners frequently donated a share of their profits to the church, and bequests to help the less fortunate were some of the final wishes dictated by dying whalers in the wills and last testaments written in Labrador. Priests often accompanied crews on the Terranova voyage to deliver mass regularly (Barkham 2001:112-114).

Multiple burials generally adhered to heads oriented to the west, feet to the east, and extended burial position, except where underlying bedrock and rocky soil would not allow. Many individuals are shown to be lying directly on bedrock. Individuals were fully articulated at the time of burial and tightly packed into the graves. Crowding occurred when bedrock and substrate made it difficult to dig a sufficiently deep burial pit.

The majority of burials in the Saddle Island Cemetery are simple, primary, articulated, and complete with individuals buried in grave pits below ground surface. There are a couple of exceptions, including compound burials that have undergone disturbance. The gravemarkers seem to be concentrated in the eastern part of the Area L which suggests that these marked burials were interred earlier than the subsequent burials to the west and south, and the rocks placed to indicate occupied ground. This hypothesis could help explain why Feature 1 is located on the southern periphery of Area L where it may have been the result of one of the later overwinterings, and the bodies were temporarily laid together near their burial ground so they would not have to be transported very far for burial in the spring.

Most of the items found with skeletal remains can be considered personal belongings. The only object(s) clearly considered a grave offering to the deceased is the wooden cross placed on the chest of the individual in Burial 57.

While Kennedy (1985:8) suggests the burials in Area M were a result of the cemetery within Area L being too full, excavation proved there was ample unused ground inside Area L for the additional burials in Area M (Tuck 1989a:223). Many burial maps clearly depict the rocks, boulders, and bedrock outcrops that influenced burial position and grave shape.

Area M is unique for the high incidence of graves containing personal belongings (Burial 59 and 60A-C) or intentional grave offerings (Burial 57) other than their clothing. This may suggest the individuals in Burials 59 and 60 were afforded a certain respect such that their belongings were not repurposed or sold after their death. Alternately, the circumstances surrounding their death did not allow for a thorough search through their clothing before they were interred. Burial 57 demonstrates the rare circumstance where someone took special care to make a wooden cross and place it directly on his chest. One may argue the four coffin burials located in Area L show similar consideration and even more effort.

Chapter 7 Osteological Study

It is difficult to visualize what it may have been like to work as a mariner and whaler aboard a ship crossing the Atlantic in 1565 to hunt whales along the southern coast of Labrador. This chapter will describe the collection according to important and commonly studied biometric criterion.

7.1 Bias in Samples and Methods

In a cemetery of sixteenth-century whalers this study can expect underrepresentation of the youngest age classes, as well as women, and possibly the oldest age classes. Bias in demographic data in the sample is therefore non-representative of the age range of their origin population(s).

Overall poor preservation across the cemetery compounds the loss of data, such as missing toes or fingers, and elements that are small or do not preserve well. Alternatively, in burials with exceptional preservation, such as Burial 4, a more complete set of pathological conditions may cluster; however, this is a bias in preservation that allows for a level of observation that is impossible in most burials.

7.1.1 Conservation Measures

Judith Logan (email February 12, 2010) reported that the human remains from EkBc-01 were mostly untreated, with few exceptions. During the time of excavation it was known that the cemetery site supervisor, Brenda V. Kennedy, would be transferring the Saddle Island cemetery skeletal material to the University of Calgary where she would perform isotopic studies on the collection as part of her Ph.D. research. Minimal conservation measures were administered to prevent possible contamination to Kennedy's isotope samples.

A few skeletons underwent some experimental conservation treatment in hopes to stabilize the bone; however, it was not always successful and occasionally contributed to further damage and instability of the bone, such as Burials 28 and 37 where bones were soaked in PEG.

7.2 Ancestry

Burial patterns, artefacts, and historical documents present a more refined picture, stating the Basques held undisputed sway over the whaling industry in Labrador (Barkham 1980a:70). Most criteria for determining ancestry rely on non-metric and dental traits located on the bones and teeth. Poor preservation of crania in particular made thorough observations difficult. However, skeletal analysis of available human remains represents European ancestry.

We cannot rule out French Basques among the crew. Also, when discussing the ancestry of the sample it's important to draw attention to the French Basques who were involved in the early whaling enterprises in Labrador before Spanish Basques quickly dominated the industry by the 1540s. French Basques again became involved in some later whaling expeditions when the Spanish Basque whaling decreased by the late 1580s (Barkham 1984:518).

Hollinshead (1999) discusses the importance of French ports, particularly Saint-Jean-de-Luz, trading with England especially during embargoes and times of war between England and Spain. However, the important iron and whale oil imports from the Spanish Basque region were valuable enough to risk piracy and attack, or channeling imports through Irish ports when avoiding French and Spanish trade altogether (Hollinshead 1999:392-393). Hollinshead (1999:391) describes the Basques as "adept at exploiting the long-standing Castilian/Anglo/Franco conflicts and shifting alliances" throughout the sixteenth century in how they marketed and traded the oil between ports and countries.

The political climate affected the demographics of crews, as well as outfitting the ships, as the French and Spanish governments may have put strain on able seamen, ships and supplies, not to mention embargoes and piracy. French Basques were known to crew Spanish ships at times and vice versa once King Philip began to assemble his armada (Barkham 1974:78).

Tuck acknowledges that French Basques were also whaling in the Strait of Belle Isle, but land excavations have found no evidence of this in Red Bay harbour (Tuck

1989a:213)… though an assemblage of Normandy stoneware located in Area M in 1986 could possibly reflect a French presence in Red Bay though not necessarily related to the sixteenth-century or the whaling industry, and could simply indicate trade, or privateering, between Spanish Basques and France (Tuck 1989a:218-219).

We cannot forget that the Labrador coast was frequented and inhabited by hunter-gatherer groups for millennia. Basque historian, Lope de Isasti, reported that Amerindians along the Strait of Belle Isle could speak some Basque; and English fishing master, Richard Whitbourne, reported that the Innu sometimes worked with the Basque whaling operations in exchange for "a little bread, or some such small hire" (Martijn et al. 2003:199).

Excavations on nearby Twin Island represent a contact site between Europeans and native peoples. Inuit were present along the Strait of Belle Isle by the late sixteenth and early seventeenth centuries (Tuck 1985:232).

We also know that during July 1542 a Spanish Basque sailor gave testimony (interviewed) regarding his time in the port of Grand Bay (at the entrance of Terranova) where he met and traded with Indians who reside on the land of Grand Bay and farther up the river (Strait of Belle Isle/St. Lawrence?) on friendly terms. They exchanged deer and wolf pelts for axes, knives and "other trifles" (Biggar 1930:459-462).

Finally, archival documents mention a Portuguese fisherman, Andre Lourenço, "was buried" in Terranova (Barkham 1980a:71) so we know there were at least single, isolated graves dating to the sixteenth century.

Documents show that legal testimony was predominantly given in Basque and translated into Spanish. The majority of men who whaled along the Straits in the sixteenth century were Basque and were, for the most, part illiterate. Those who could read or write also spoke Spanish but they were the minority (Barkham 1976:237). The size of whaling crews was much larger than codfishing expeditions and came from a more widely dispersed area in order to make up skilled crews of up to 120 men (Barkham 1974:76). However, the literature review found no references to indicate crews had to be hired from outside the Spanish Basque provinces.

7.3 Numbers of Individuals

Map and skeletal data indicate a minimum of 132 individuals in the Saddle Island cemetery collection. Poor preservation and the variability of sampling and recovery success between burials did not permit simple MNI bone counts, so this study heavily relied upon map data and available notes. There is a small amount of "miscellaneous" human remains, unassigned to a specific individual, but labeling indicates these elements represent existing individuals whose remains became loose or mixed up in the field lab.

The two burial features containing extra elements (Burials 28 and 42) were positioned near adjacent burials with disturbed and incomplete remains (Burials 22 and 43), where it chances to reason that digging subsequent grave pits disturbed earlier burial features. Any other miscellaneous remains found within multiple occupancy burials did not provide sufficient evidence to increase the number of individuals in any burial feature.

The precise occupancy count of Feature 1 remains have been estimated up to 14 people (Kennedy 1985:7). The field maps clearly identify 11 individuals, assigned A-K in the field, with a possible additional individual represented by an incomplete skull just west of the feature, to which this researcher assigned, individual L. A few miscellaneous leg fragments collected just outside the main concentration of bone and textile were not attributed to any particular individual during excavation, nor were they mapped, but assumed to belong to the existing individuals.

7.4 Sex

The documentary resources provide a strong indication that all individuals aboard the whaling vessels were male; "the only people who were automatically left behind [in the Basque Country] were the women" (Barkham 1978:18). Osteological analysis of available skull and pelvises confirms male sex estimation (? Male, Male) in 24 observable individuals, the remainder were indeterminate (Table 7-1).

Table 7-1 Individuals with Confirmed Sex Estimation.

? Male / Male	3, 4A, 4B, 4C, 4D, 5A, 5B, 6A, 6B, 6C, 6D, 6F, 7, 8A, 8B, 9A, 9B, 11A, 11B, 28C, 37, F1A, F1B, F1H

7.5 Age at Death

Ideally, we have the opportunity to assess as many areas of a complete skeleton to evaluate an individual's skeletal age at death. Fragmentary and damaged skeletal remains in the Saddle Island population often meant age estimates were based a single criterion; sometimes from a single tooth, a broken os pubis, or a portion of a skull.

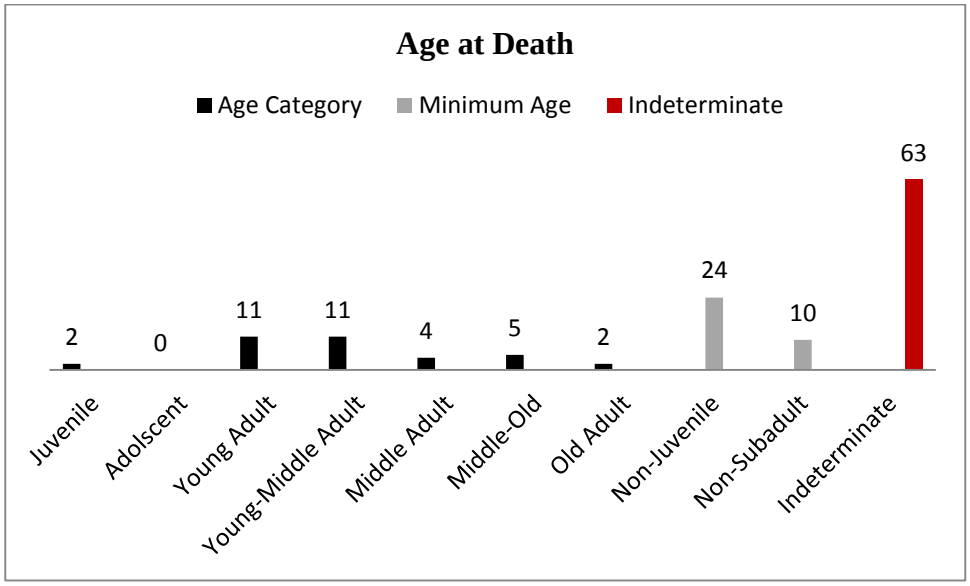


Figure 7-1 Age estimations for individuals in Burials 1-62 and Feature 1. Each individual was assigned to an age category, range of categories, or given a minimum age where skeletal data allowed.

The population represents individuals ranging in age from 18 to at least 65 years of age, with most between the ages of 20 and 40 years old (26 of 35 observations assigned to age categories). The two younger boys in the cemetery are approximately 12-13 years old and their identification relies strongly on observations taken during excavation

(Burials 38A and 50). Teeth recovered from the two individuals in Burial 38 became commingled in the field so it is difficult to discern which teeth actually belong to 38A and 38B.

Some of the older age categories may represent some Basque who had been travelling to Terranova for more than 20 years (Barkham 1980a:73).

7.6 Stature

Stature calculations are an approximate estimate with a standard error. This study did not use the age correction for individuals over 30 years of age (Trotter 1970) because of the difficulty in determining a more accurate age for each individual, as is often the case with archaeological specimens.

Stature estimates ranged from 157.0 cm +/- 3.27 to 172.3 cm +/- 3.27, with a mean height of 164.2 cm, or 5 feet 4 inches. Taking all observations into account and their respective standard errors, statures ranged from 153.7 cm to 175.6 cm, or 5 feet 0 inches to 5 feet 7.5 inches. Individual statures are provided in Appendix B.

Attempts were made to estimate stature from in situ field drawings, measuring from the distal cranial end to the distal end of the heel (talus or calcaneous), however these are only estimates, as skeletons were not always discovered in perfectly extended supine position, or in excellent preserved state. The skeletal length was not measured in situ and as a result skeletal diagrams may be affected by any parallax error caused by the recorder

if they moved around the skeleton to sketch the elements, as well as variability of drawing accuracy between recorders. These estimates were not included in the stature estimates above, but included as maximum skeletal length (map) approximations in Appendix B for comparison.

7.7 Health and Disease

During the decades the Basque whaling enterprise was operating in southern Labrador frequent outbreaks of bubonic plague were prevalent in both Spain (1500s; 1596-1602) and France (1520-1600) and often in combination with war, food shortages, famine, social unrest, and dislocation (Kohn 2001:117-118, 321). In Spain, the devastation of plague outbreaks throughout the century, and especially at the end of the century, contributed to an already demoralized nation which suffered from military defeats and economic collapse. Spanish Basque whaling centers enjoyed decades of prosperity through the latter half of the century but once King Philip embargoed their whale ships to his armada commerce would have slowed or stopped in these centers. Plague deaths, decreased commercial activity, and stresses of religious war were demoralizing, contributing to domestic disintegration (Kohn 2001:320-21) and, in turn, making populations susceptible to the transmission of other infectious diseases. In France, diphtheria and whooping cough also had a major outbreak recorded around Paris in 1576 and 1578, respectively (Kohn 252-254), and may have affected some of the whalers if they were drawn from, or travelled through, that region.

Individuals chosen as whalers would be selected for their health and physical strength. The health of individuals represented in the cemetery is partly determined by any evidence of pathology, including diseases of malnutrition, infectious disease and fractures. When studying an archaeological group of skeletons it is unusual for the cause of death to be known. A lack of skeletal evidence for cause of death could support an argument for death by drowning, for example, which was an occupational hazard. However, overwintering whalers may have also suffered frostbite, starvation, or other deficiency diseases.

There are varying degrees of malnutrition, or dietary deficiencies. These deficiencies do not always show up on the skeleton before individuals succumb to death. In some cases they last as only short episodes in the life of the individual. Occasionally bioarchaeologists are afforded the opportunity to observe the effects of dietary stressors on the skeleton.

Because preservation allowed for only a sample of the Saddle Island cemetery to be analysed, the following population summaries reflect frequencies that may be slightly skewed. Factors such as frequency of fractures and disease are, therefore, unknown for cemetery population as a whole. Overall, the Saddle Island population is young, strong, and healthy showing marked muscle attachments. This chapter is a summary of the types of pathological conditions describing the collection.

7.7.1 Congenital and Developmental Abnormalities

Congenital abnormalities are most often seen in the vertebral column in archaeological studies. The Saddle Island population exhibits a few examples.

Individual 4A exhibits a number of congenital abnormalities along the spine. One instance of aplasia, or underdevelopment, of the right transverse process was observed on the first lumbar vertebra. Sacral development anomalies are most common in the form of a sacral hiatus, or sacral cleft, where the sacral arches do not form properly. Individual 4A exhibits a sacral hiatus along the first, fourth, and fifth sacral vertebrae, as well as a case of sacral spina bifida occulta with a very narrow aperture occurring from the second to fifth sacral vertebrae. The eleventh thoracic vertebra exhibited a defect to the anterior centrum caused either by a congenital aplasia or a compression injury from a traumatic event.

Individual 3 was found to have a sacral cleft on the first sacral vertebra, and a sacral hiatus between the fourth and fifth sacral vertebrae; and a single sacral hiatus was observed on the fifth sacral vertebra of Individual 11A.

The vertebral abnormalities observed with Individuals 3, 4A, and 11 would not likely impede movement or cause discomfort.

7.7.1.1 Cribra Orbitalia

Iron deficiency anaemia can result in lesions of the skull. Cribra orbitalia manifests as pitting along the roof and margins of the interior eye sockets. There is one case of healed cribra orbitalia among the whalers (4A) suggesting he may have experienced malnutrition as a young child but no longer suffered the deficiency. It should also be noted that scurvy can produce similar lesions and it is not always easy to differentiate how each manifests on bone to make a correct diagnosis.

7.7.1.2 Scurvy

Scurvy is caused by a prolonged vitamin C (ascorbic acid) deficiency. In human remains collections where bone preservation is mostly fair-to-poor, as with the Saddle Island human remains, diagnosing pathological conditions can be challenging. Scurvy, for example, shares similar osseous changes with other diseases and diagnosing these changes on incomplete skeletons in poor condition is difficult. The analysis of the Saddle Island collection does not allow for unequivocal diagnoses of scurvy, however, there is possible evidence of the disease in at least one skeleton. Dark staining on bones and teeth is complicated by poor preservation and staining from burial matrix, but evidence of longitudinal endofractures along both fibulae in Individual 4A may be indicative of fractures under stress of subperiosteal haemorraging associated with scurvy. A similar pattern of darkened staining and fracturing was identified and described in Maat's studies of scurvy in Dutch whalers in Svalbard (Maat: 1982, 2004). However, the distal end of

the left fibula also exhibits a bony thickening, or area of new bone apposition suggesting healing from some sort of infection.

The lack of positive evidence for scurvy in the Saddle Island population, especially in individuals who would have overwintered in Red Bay, is likely skewed by poor bone preservation. One researcher credits the inclusion of raw cod roe in the sixteenth-century Basque whaling diet as an excellent source of vitamin C (Zulueta 2000:267-269).

7.7.2 Joint Disease

Spondyloarthropathy is a type of arthritis that most commonly affects sacroiliac joints, the spine, and the costovertebral joints. Other evidence of joint disease, including osteoarthritis, will be discussed in section 7.7.5.

The case of spondyloarthropathy observed in Burial 7 could be more precisely diagnosed as ankylosing spondylolitis, or Marie-Strümpell's Disease, causing the right side of the sacrum (S1-S5) to fuse completely with the right innominate. Anykylosing spondylolitis (AS) most commonly manifests asymmetrically as an inflammatory arthritis in the sacroiliac joint and may lead to partial or complete destruction of the joint resulting in complete fusion of the sacrum and ilium (Ortner 2003:571-572). An individual with AS might suffer pain, stiffness, and limited mobility in the affected joints; however, localized pain and inflammation often lessens once fusion is complete, as with bony ankylosis. The onset of back pain associated with AS often occurs in individuals in their third decade of life unless due to an earlier onset with juvenile AS (Van der Linden et al.

2012:1202). The disease can remain active for decades or may go into remission. Those individuals who suffer with the disease for more than a decade may experience a somewhat reduced life expectancy (Van der Linden et al. 2012:1212). It is possible that once the hip becomes fused to the base of the spine the individual will experience less pain and could move fairly unimpeded, even with one hip fused to the base of the spine.

Burial 7 exhibits smooth bony ankylosis with smooth trabecular continuity between the ilium and sacrum. The fusion is both through the joint as well across the joint. There are a few osteophytes along the superior fusion margin. A large foramen runs vertically through the middle of the superior fusion margin, down through the inferior margin of fusion (6 mm – 18.7 mm wide). As a result, there are some asymmetrical observations between the left and right acetabulum, and femora. The right femoral neck and head is angled slightly more medially, and the metaphysis twisted more laterally, than observed on the left femur.

7.7.2.1 Miscellaneous Pathological Conditions

One whaler (4A) displays an unusual porosity (fine pitting) over most of the bones in his feet, particularly along non-articular surfaces, and over some rib surfaces. This may be the result of a non-specific infection.

Osteitis is an inflammation of bone. Burial 3 exhibits signs of ventral osteitis on several ribs that show active signs of healing; and lytic lesions on the vertebral centra of the sixth and seventh cervical vertebrae.

It is unlikely these pathological conditions would have impeded the mobility of these men.

7.7.3 Trauma

Interpersonal trauma may be of a personal nature, or injuries incurred in piratical attacks, as did frequently happen between French and Spanish Basques during the 1550s and into the early seventeenth century with English and Dutch ships (Barkham 1984:518).

Two possible cases of trauma identified on Individual 4A include a probable depressed skull fracture, and a healed fracture at the distal end of a left fibula which could be related or compounded by a diagnosis of scurvy. A healed fracture to the first proximal phalange on the right foot of Individual 4B was also observed. As these fractures are all healed, neither individual would suffer lasting effects.

7.7.4 Dental Health

7.7.4.1 Tooth Loss

Tooth loss was evident in most observable individuals, but with so many loose teeth recovered it is difficult to determine if missing teeth were missing in life (congenitally absent, or premortem tooth loss) or if recovery was poor. Only 63 out of 132 individuals had teeth preserved but none of those had a full set of dentition. At least one individual (Burial 3) had 25 out of a maximum of 32 teeth. Incidence of alveolar

resorption due to periodontal disease or abscess, or from diseases such as scurvy, might cause teeth to become loose in life. In situ bone decay may have contributed to loss of such teeth from the mandible or maxilla. For this reason, loose teeth made it difficult to differentiate between antemortem and postmortem tooth loss.

7.7.4.2 Calculus

Slight to moderate calculus was present on the teeth of nine individuals. Calculus is often more difficult to observe in loose teeth since calculus frequently forms at the enamel-root juncture. Many of the teeth recovered were loose and suffered root loss due to the wet burial matrix.

7.7.4.3 Caries

Caries was observed in nine individuals but there was never an incidence of more than seven caries in any one individual (Burial 11A). All caries measured small to medium-size. The whalers would have had access to local Labrador foods to balance their seaman's diet so it is more likely poor dental hygiene than diet was the cause for cavities.

7.7.4.4 Enamel Hypoplasia and Foramen Caecum Hypoplasia

Both of these hypoplastic defects are present among the Saddle Island sample and tells us that some of these men experienced a dietary deficiency, or a possible viral infection, that would have interrupted their enamel growth in childhood.

Enamel hypoplasia was observed on five individuals and presented as a pattern horizontal pits or bands across tooth enamel (3, 4A, 5A, 11A, F1C). Burial 3 demonstrated the most affected teeth with at least eight teeth affected, but as many as 13 teeth. Foramen caecum hypoplasia occurred in two individuals (4A and F1C) and presented as a hole between cusps on the buccal crown of molars (Figure 7.2).

Figure 7-2 Foramen caecum in M2 in Burial 4A. Located on the buccal aspect of the crown of the tooth in the centre of the photo.

7.7.4.5 Enamel Pearls and Enamel Extensions

Extraneous deposits of enamel occasionally occur on the root sheath of molars. Enamel pearls appear as raised, semi-isolated spheres on the roots, while an enamel extension is more often expressed as a low, thinly tapering, and continuous with enamel of the crown (Schwartz 1995:184). The only incidence of these developmental anomalies occur in Burial 4. Individual 4C exhibits enamel pearls (Figure 7.3), while enamel extensions were observed in both 4C and 4D. Despite being found on adult teeth, enamel pearls and extensions indicate a period of nutritional stress during infancy, or even in the womb.

Figure 7-3 Enamel pearls located on roots of molars of Burial 4C.

7.7.4.6 Dental Trauma

The only obvious incidence of dental trauma observed in the Saddle Island collection was infraction, or chipped teeth, observed in one individual (Burial 11A). This individual also exhibited an obvious overbite and it is possible the overbite may have contributed to the enamel infraction.

Postmortem damage was common in the enamel of many specimens, including incomplete crowns or enamel loss. This made observation difficult to conclusively identify dental trauma.

7.7.4.7 Periodontal Disease

Periodontal disease and abscesses could be observed in specimens with complete and incomplete mandible and maxilla fragments. Eight individuals showed signs of advanced alveolar resorption, or periodontal disease, (4A, 4B, 6D, 7, 11A, 14, 37, and F1A). Individual 7 exhibited an abscessed lower right third molar. Two additional abscesses tentatively identified in Individuals 11A and 12B. Alveolar resorption was significant in many cases causing teeth to be loose or postmortem tooth loss.

7.7.5 Activity-Related Skeletal Changes

Occupational stress is often manifested in the skeleton by unusual patterns of degenerative arthritis. Osteoarthritis is a type of arthritis marked by progressive cartilage

deterioration in synovial (freely moving) joints and vertebrae (Thomas 1997:1364). Osteoarthritis, or degenerative joint disease (DJD) as it is sometimes called, is the most common disease to affect joint surfaces in both modern populations and archaeological groups (Ortner 2003; Rogers and Waldron 1995:32, 44). Given the labour intensive demands on a whaler's body it is not surprising that signs of osteoarthritis are present in skeletons with preserved infracranial skeletons. Most cases were scored in the early stages of degenerative change. The Saddle Island whaling population presents examples of osteoarthritis in all major joints in the upper and lower limbs, and along the spine. The most common activity-related pathological changes observed in spines at Saddle Island include:

1. Pitting of the facet joints in the vertebrae (osteoarthritis)
2. Osteophytes, or extra/new bone, around joint surfaces and margins (marginal osteophytes)
3. Pits or indentations in the vertebral body surfaces (Schmorl's nodes, see Figure 7.4)
4. Spinal ligaments that turn to bone (ossified ligamentum flavum, see Figure 7.5)

Possible activity-related vertebral trauma includes two cases of a compression injury causing a wedge-shaped centrum. Compression injuries of this nature are caused when there is too much pressure on the vertebral body, and may occur if an individual falls while leaning forward, or it could be developmental. Any spinal disease which weakens the bone, such as osteoporosis, could also manifest in compression fractures but this is not expected to be the cause in these individuals.

Figure 7-4 Schmorl's node located on inferior centrum of thoracic vertebra in Burial 4B.

Figure 7-5 Ossified ligamentum flavum on Burial 4A vertebra.

Musculoskeletal stress stimulates increased blood flow to muscle-, tendon-, and ligament-bone junctions where the greatest muscular activity occur on the body (Hawkey and Merbs 1995:324). These areas will often show areas of greatest robusticity.

The Saddle Island cemetery demonstrated the most common incidence of musculoskeletal stress markers on the upper limbs, including the radius (biceps brachii, see Figure 7.6), clavicle (costoclavicular ligament), humerus (deltoideus; distal humerus), ulna (brachialus), and scapula (accessory teres major). Lower limb musculoskeletal stress markers are frequently observed on the femoral head (ligamentum teres), femur (greater/lesser trochanters), calcaneus (Achilles), and os coxa (various insertions). A posterior rim fracture at the hip joint (acetabular) may also be attributed to activity-related trauma.

There are several observations of impingement syndromes in the form of squatting facets on several femora, tibiae and, or, tarsals of six individuals in the Saddle Island cemetery, including one case of 'soccer'/'footballers' ankle on Burial 3's left talus.

Ossified ligaments and cartilage can be indicators of age or musculoskeletal stress. One individual exhibits ossification of their apical ligament (C1-C3), obturator externus muscle (left femur), and thyroid cartilage (Burial 3).

Figure 7-6 Marked muscle attachments at biceps brachii on Burial 4B humeri, compared to medical study specimens.

7.8 Discussion

The Saddle Island cemetery is composed of men who came to Labrador to hunt whales. Determining sex and gender differences in this population is not necessary, however, age and status differences may still be prevalent in an all-male industry-specific cemetery, assuming the population was not affected by time, weather, sickness or other pressures at the time of burial.

The remains of at least 132 individuals indicate a population of men ranging in age from 18 to at least 65 years of age, with most between the ages of 20 and 40 years old. Based on observations taken during excavation, there may be two younger boys in the

cemetery aged approximately 12-13 years old. The men appear European in their attributes, dress, and burial manner. They were shorter, standing between 5 feet and 5 foot 7 inches, with most exhibiting robust muscle markings along the base of the skull, shoulders, arms, and legs. Areas of the spine showed signs of stress indicative of intensive activity or repetitive trauma.

The variable preservation between individuals did not provide a large enough sample to attribute specific skeletal changes unequivocally to specific activities but their appearance and severe expression suggests stressful and repetitive activities within a physically demanding lifestyle.

The whalers were healthy and exhibited usual signs of age and stress from the demands of their occupation, characteristics that would have made them attractive to employers looking to crew a whaling vessel to the New World. The whalers were relatively healthy individuals with a few showing signs of developmental stress as children, or tooth loss and periodontal disease that is not unusual in a population of this size, age, and time period

Chapter 8 Conclusions

The objectives of this thesis were meant to build on our understanding of the archaeology at Red Bay by focusing on the human remains in the cemetery. The objectives were to: 1) digitize the burial maps and analyse burial characteristics to determine if patterns emerge between treatment of the dead within or between the single and multiple graves, and the buried versus "unburied" graves, 2) identify and describe the human remains removed from the Saddle Island cemetery, and 3) examine the skeletons for pathological conditions and determine if skeletal changes developed as a result of their strenuous whaling lifestyle.

This research has contributed to our understanding of the living and deceased men who came to Red Bay to hunt whales during the sixteenth century. By identifying and analyzing the remains of each burial feature this research was able to describe individuals as well as the population as a whole. The osteological analyses provided more detailed health descriptions of the men and boys and contributed general observations on how the physical activities of a whaling career impacted the whaler's skeletons.

The Saddle Island cemetery contained 63 burial features containing the remains of at least 132 individuals. The men appesar to have been strong, relatively short, mostly healthy, ranging in age from late teens to mid-sixties, with some evidence that boys aged approximately 12 years old were part of the whaling crew. The men were predominantly buried according to Christian burial practice; lying on their back, extended, head to the

west, feet to the east, hands crossed over the pelvis or chest, and feet together. The types of pathological conditions observed in this study indicate that whaling was a physically demanding occupation that put stress on the skeletons of the men and boys who hunted whales around Red Bay.

This thesis digitized over 60 field maps and generated descriptive maps for individual burial features, as well as produced a complete map of the Saddle Island Cemetery. This allowed the map data to be manipulated for analysis and interpretations of burial positions, contents, and patterns. The patterns observed across the cemetery describe the care and attention the living paid to burying their fellow crew.

In addition to addressing the main objectives of this thesis, the results of this research provide a basis for future studies, including isotopic and DNA research that may narrow the geographic origins of the Saddle Island population. This burial study contributes to forthcoming comparative research between the Saddle Island and Svalbard (Spitsbergen) populations, and will help shape our understanding of early European whaling populations.

Archival data suggests there may have been upwards of 800-1000 whalers around Red Bay during the peak years of the whaling trade. In conjunction with the hazards of the trade it is surprising that the Saddle Island cemetery indicates an average death rate of less than 1% per year for the peak years 1540 to 1600, an estimate that seems unusually low for such a dangerous occupation (Tuck 1986:152). In a 1619 statement Juan de Echevet recalled 540 people dying during the overwintering of several ships in 1576-1577

(Proulx 2007:I:33), a number which is thought to be a far too high by other scholars (Huxley 1987:104).

The whaling fishery brought men from the Basque Country for hundreds of years. Some men spent their whole careers returning to the coasts of Newfoundland and Labrador, such as Matias de Echeveste, a pilot from Zarauz who reportedly made 28 voyages to Newfoundland between 1545 and including the year he died, in 1599 (Markham 1882:366). You would expect that the men who regularly returned to Terranova for years over their careers would have developed a strong connection to the harbours they fished and hunted whales. While we may not know exactly how many years it took to fill the Saddle Island cemetery with the men and boys identified in this thesis, the Basques obviously recognized Red Bay as a worthy place to establish a cemetery and honour their fellow crewmembers and countrymen.

It seems unlikely the Saddle Island cemetery was the only cemetery of its kind along the southern Labrador coast considering the estimated number of whalers and the hazards of the job; however, it is the only one to be found and systematically investigated. The study of the human remains and mortuary behavior from Saddle Island provides stories of life and death of a sixteenth-century whaler and offers us a rare and unique opportunity to understand the men who sailed annually from the Basque Country to hunt whales to light the streets of Europe.

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Appendix A: Burial Feature Maps

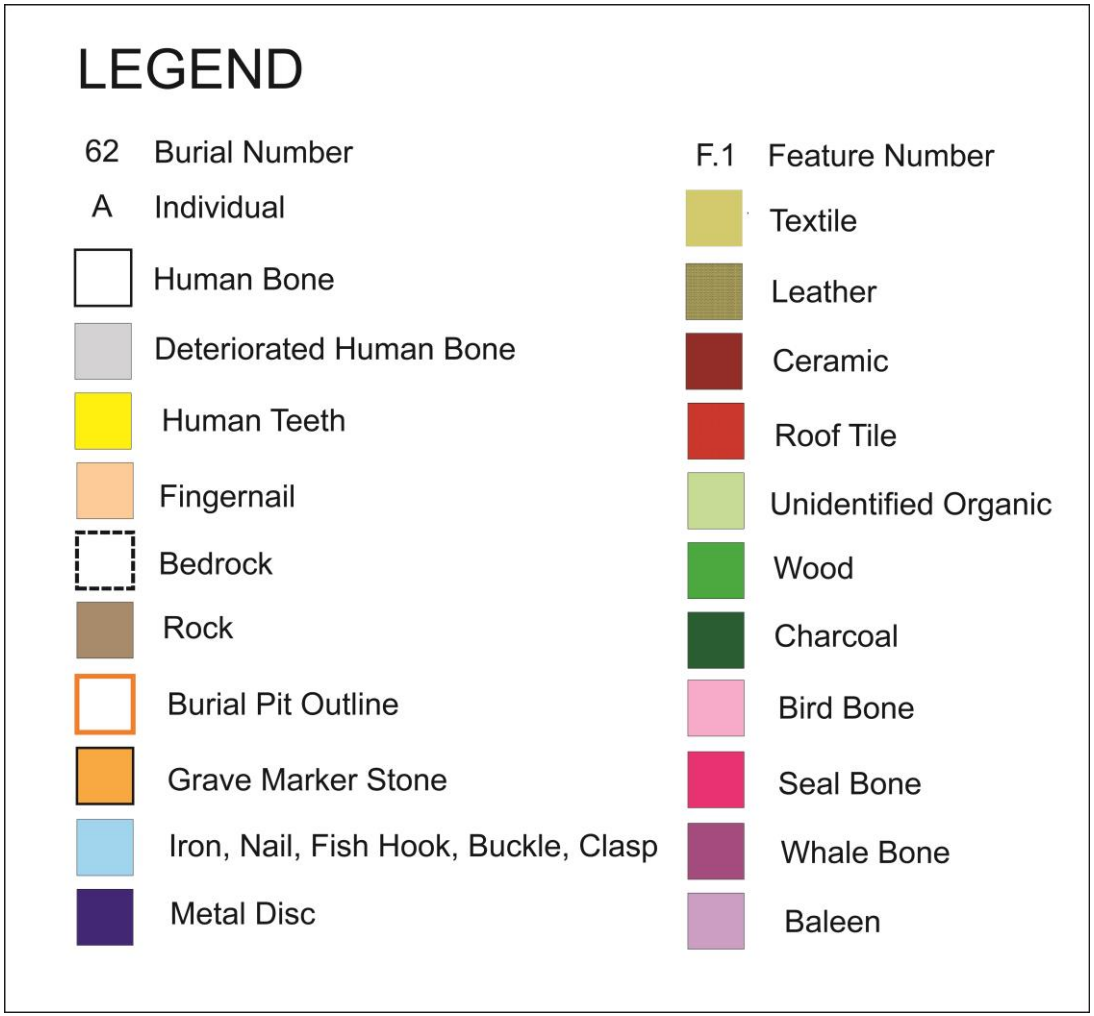

Plate A-1. Legend for artefacts and materials depicted in burial feature maps.

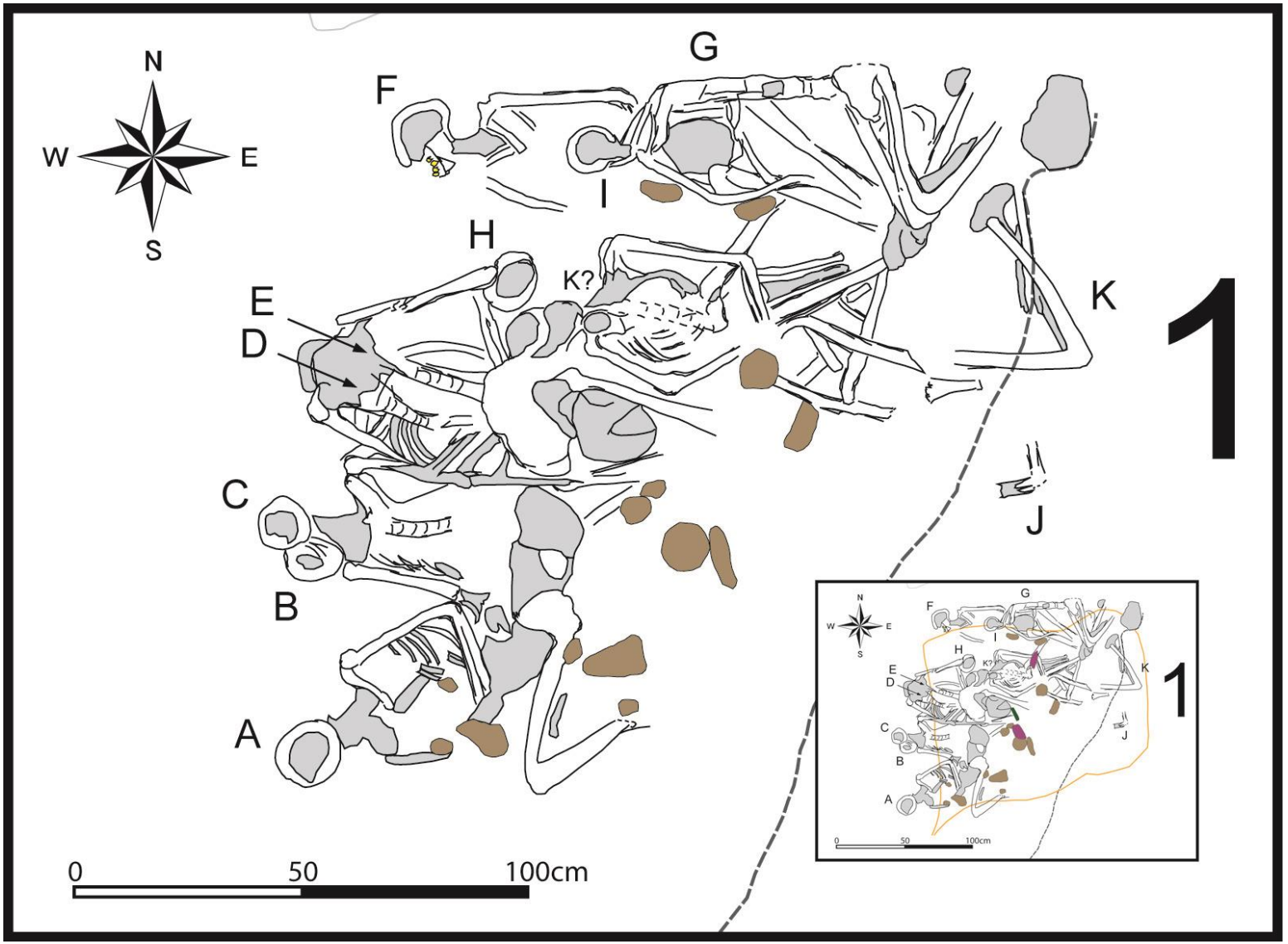
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Plate A-2. Burial 1, mass burial (11 person minimum): (A) flexed burial on back, knees collapsed right, hands cross over waist right over left, aligned WSW-ENE (head to sacrum); (B) overlapping significantly with individual C, unobservable burial posture, suggested head orientation to west; (C) overlapping significantly with individual B, unobservable burial posture, possibly aligned W-E (head to sacrum); (D) overlapping significantly with individual E, unobservable burial position, possibly aligned WNW-ESE (head to sacrum); (E) overlapping significantly with individual D, unobservable burial position, possibly aligned WNW-ESE (head to sacrum); (F) semi-flexed burial on right side, knees mixed (right extended, left semi-flexed), head rotated right, aligned W-E (head to sacrum), overlapping significantly with individuals G and I; (G) semi-flexed burial on right side, knees flexed and collapsed right, possibly aligned W-E (neck to sacrum), overlapping significantly with individuals F and I; (H) overlapping significantly with individuals E and K; (I) overlapping significantly with individuals F and K; (J) depicted only by a semi-flexed limb joint; (K) overlapping significantly with individuals H and I, extended burial suggested by torso and thighs, on back, knees flexed and collapsed right(?), hands on pelvis, aligned WNW-ESE (neck to femora). Inset depicts original grave pit outline with burned wood and whalebone specimens.

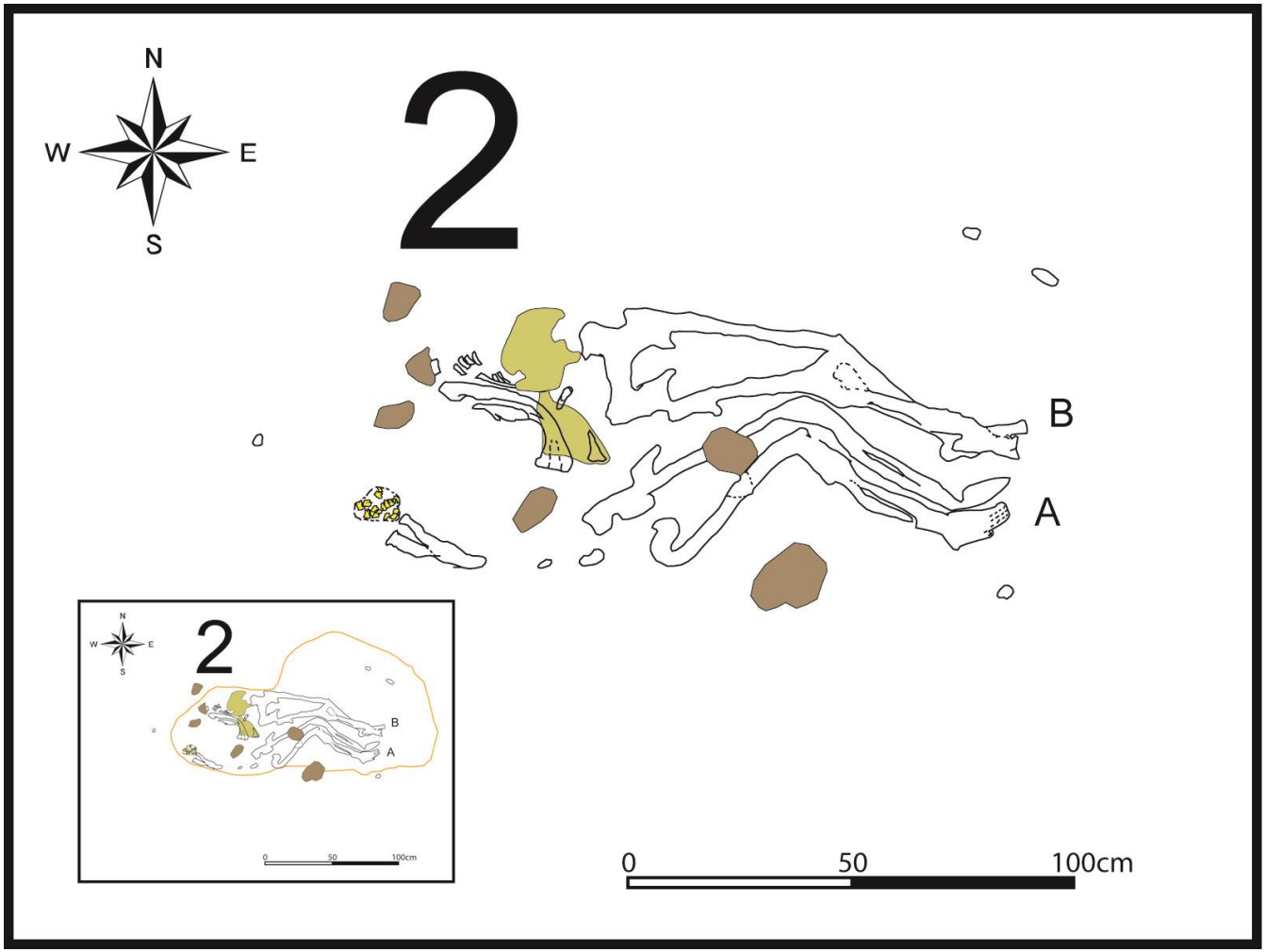

Plate A-3. Burial 2, two person burial: (A) semi-flexed burial with legs collapsed left, feet together, skeleton aligned W-E (torso to feet), textile over torso and possible left arm; (B) extended burial on back, knees mixed (right extended, left semi-flexed) and crossed right over left, feet together, skeleton aligned W-E (torso to knees) with feet oriented ESE, textile over torso. Inset depicts irregular grave pit outline revealed above bone level. Grave aligned W-E.

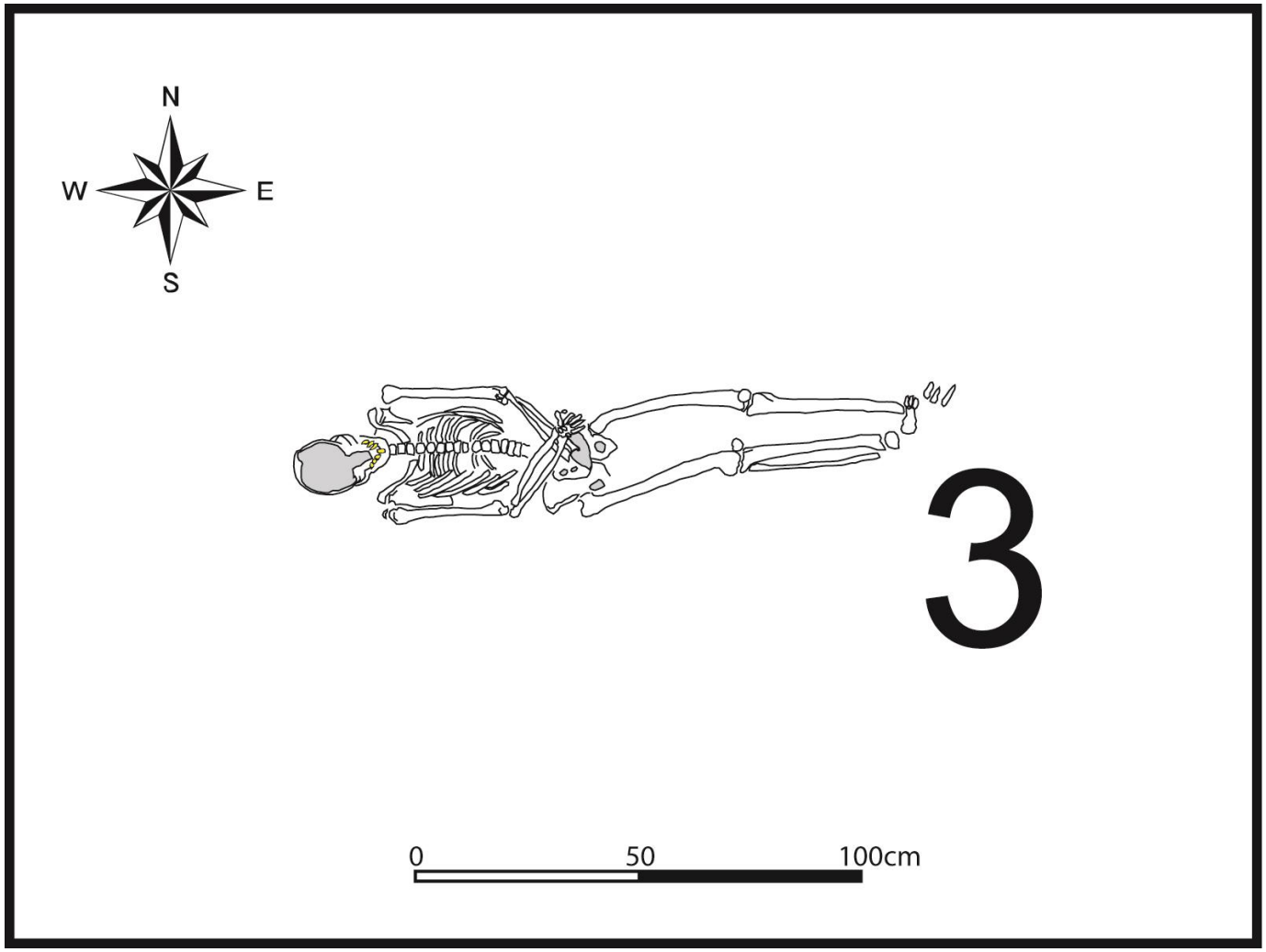

Plate A-4. Burial 3, single burial: extended burial on back, feet crossed right over left, wrists crossed right over left with hands on pelvis, head looking straightforward, skeleton aligned W-E (head to feet), unmapped artefacts include roof tile, bird bone, and whale bone fragments. The roof tile, bird bone, and whalebone fragments noted by Kennedy (1997:1) actually belong to those depicted Burial 4, see Plate A-5.

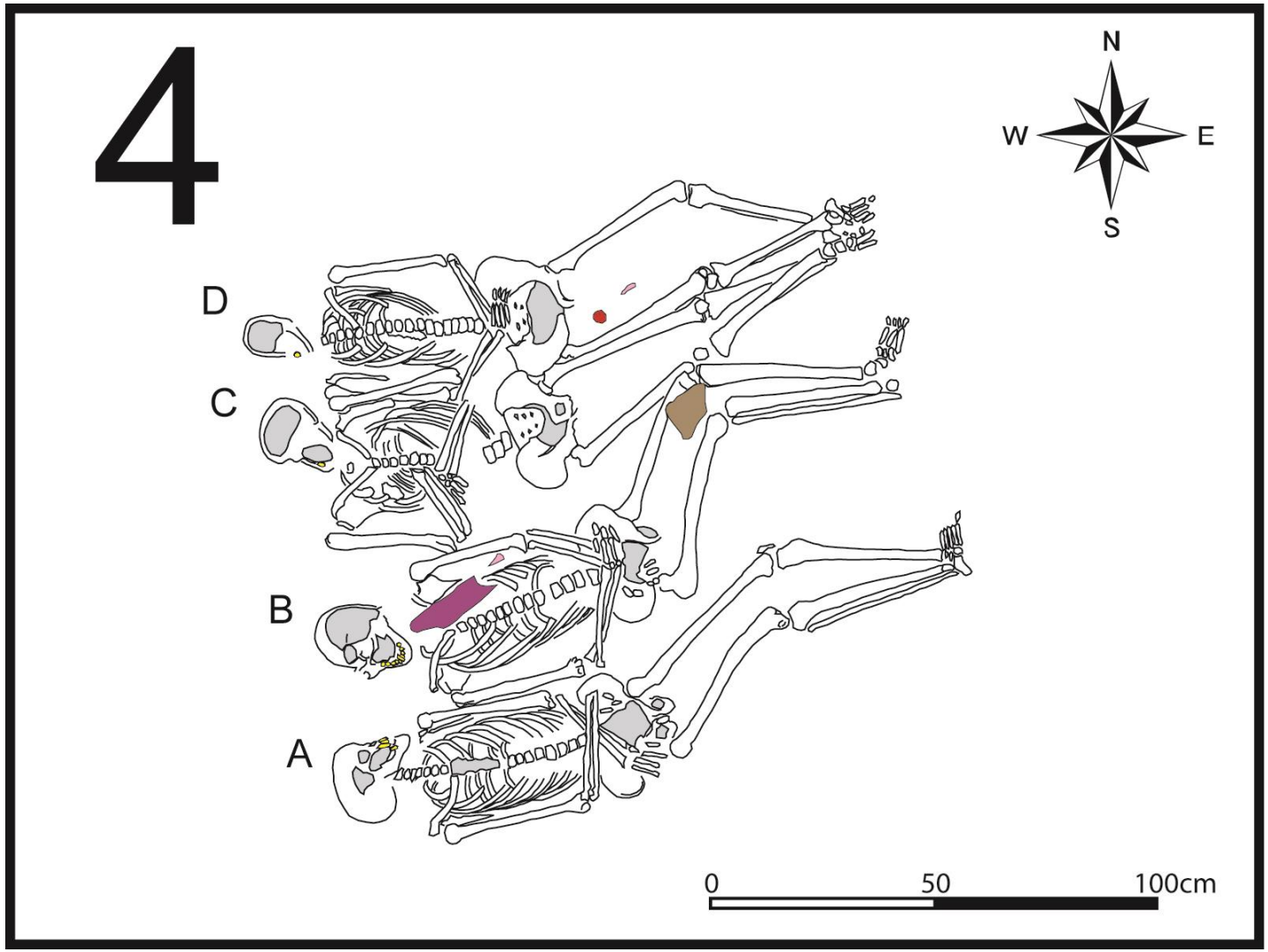
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Plate A-5. Burial 4, four person burial: (A) semi-flexed burial on back, knees collapsed left, feet together with right foot crossed over left, arms crossed right over left with hands on pelvis, head rotated left, skeleton aligned WSW-ENE (head to feet); (B) semi-flexed burial on back, knees semi-flexed and collapsed left, wrists crossed right over left with hands on pelvis, skeleton aligned WSW-ENE (head to feet), whalebone and bird bone fragments over left chest and arm; (C) semi-flexed burial on back, legs extended with ankles crossed right over left, arms bent with hands on chest, head tilted left, skeleton aligned W-E (head to sacrum) with feet oriented ENE; (D) semi-flexed burial on back, knees mixed (right leg extended, left semi-flexed and collapsed left), ankles crossed right over left, wrists crossed right over left with hands on pelvis, skeleton aligned W-E (head to sacrum) with feet oriented ENE, a roof tile fragment and bird bone located between thighs.

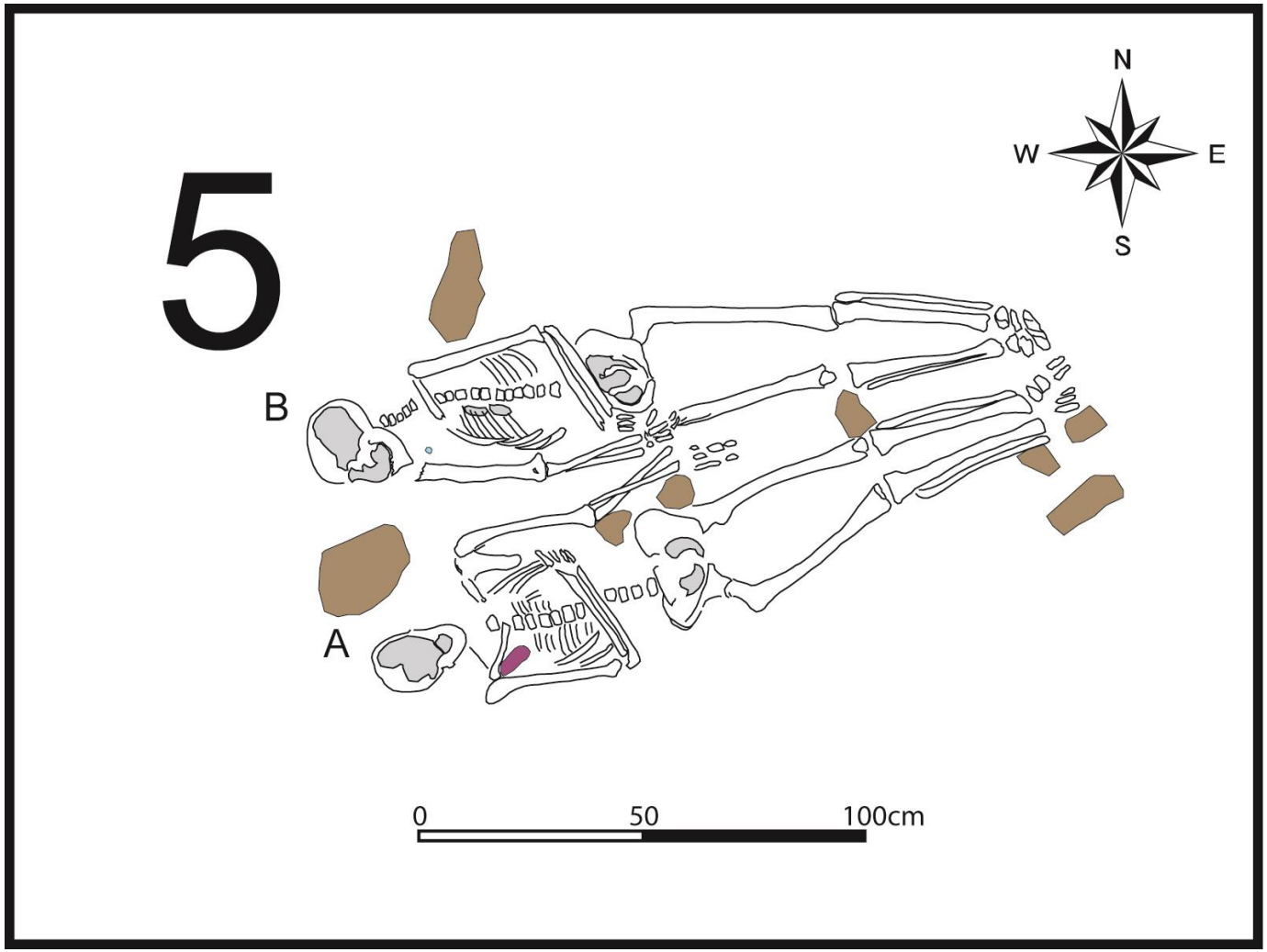

Plate A-6. Burial 5, two person burial: (A) extended burial on back, hands mixed (right on chest, left extended), head straightforward, aligned WSW-ENE (head to feet), whalebone fragment on right shoulder; (B) extended burial on back with torso rotated slightly right, feet together, hands mixed (right extended, left on pelvis), head rotated right, aligned WSW-E (head to feet), metal clasp (textile closure?) located near right shoulder.

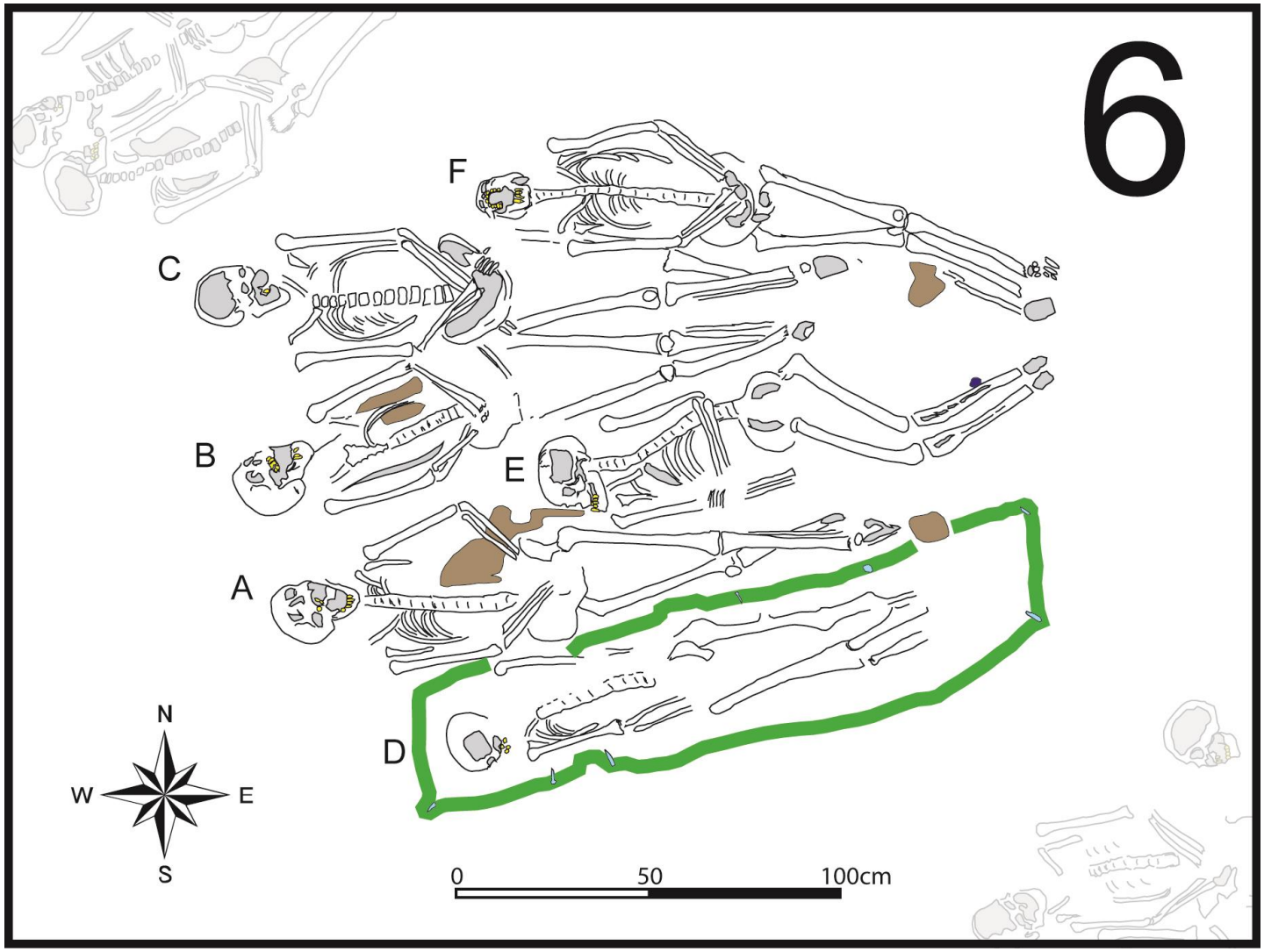
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Plate A-7. Burial 6, six person burial: (A) extended burial on back, knees crossed left over right, hands on pelvis, head straightforward, aligned W-E (head to sacrum) with feet oriented ENE; (B) extended burial on back, ankles crossed right over left, hands on pelvis, head rotated left, aligned WSW-ENE; (C) extended burial on back, ankles crossed right over left, wrists crossed right over left with hands on pelvis, head tilted forward, aligned W-E; (D) coffin burial, extended on back, ankles crossed right over left, hands on pelvis, head rotated right, skeleton aligned WSW-ENE, artefacts include iron nails (7) and wood associated with coffin; wood adhered to skull and many parts of the skeleton due to in situ coffin roof collapse; (E) semi-flexed burial on right side, knees semi-flexed and collapsed right, feet together, hands mixed (right extended, left crossed to right elbow), head straightforward, skeleton aligned WSW-ENE with feet oriented east, artefacts include a lead disc located midway down left tibia; (F) extended burial on back, hands on pelvis right over left, head tilted back, skeleton aligned W-E with feet angled ESE.

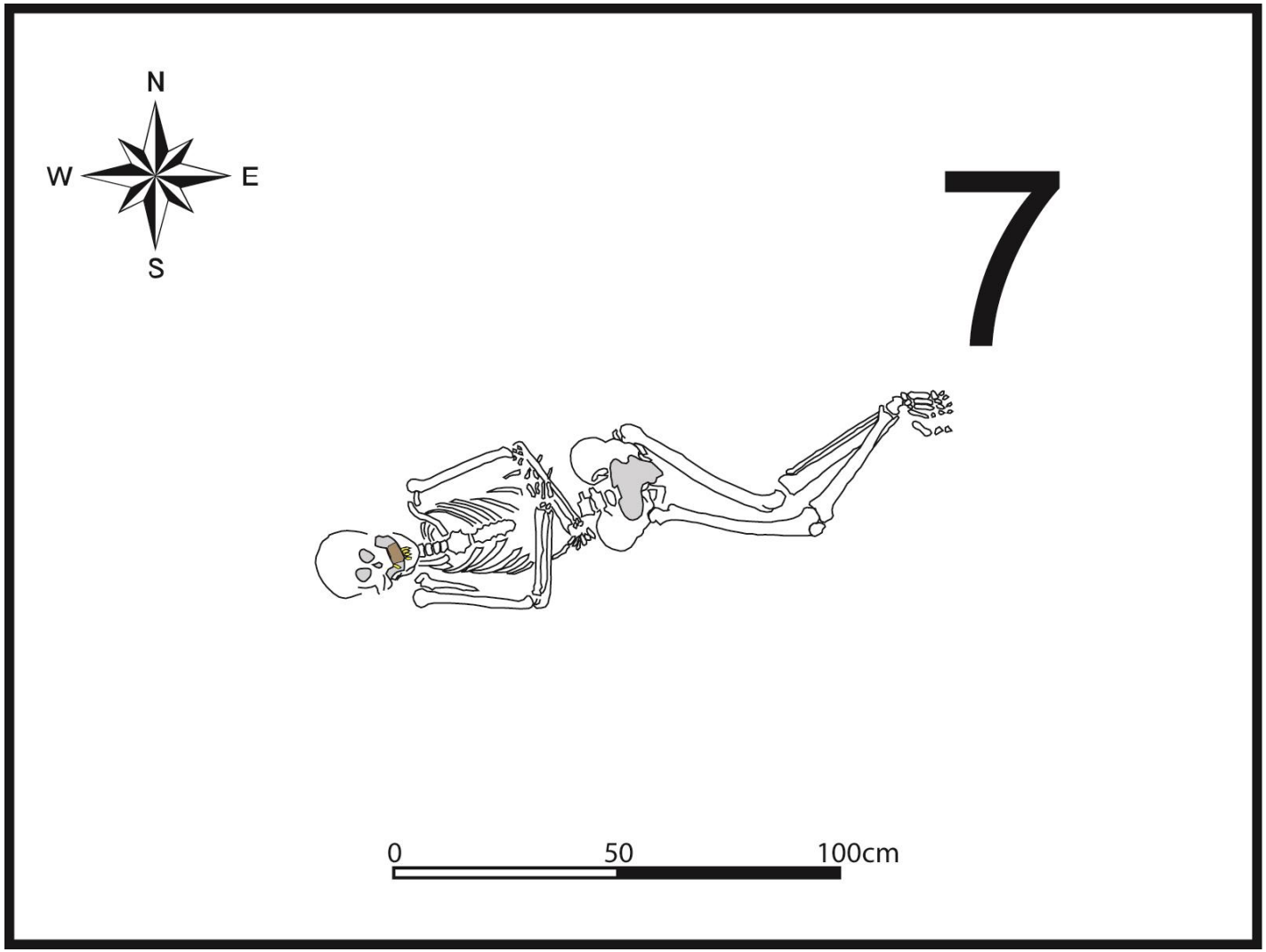

Plate A-8. Burial 7, single burial: semi-flexed burial on back, legs collapsed right, ankles crossed right over left, arms crossed right over left with hands on waist, head straightforward, skeleton aligned WSW-ENE (head to feet). Rock from grave fill fallen into mouth.

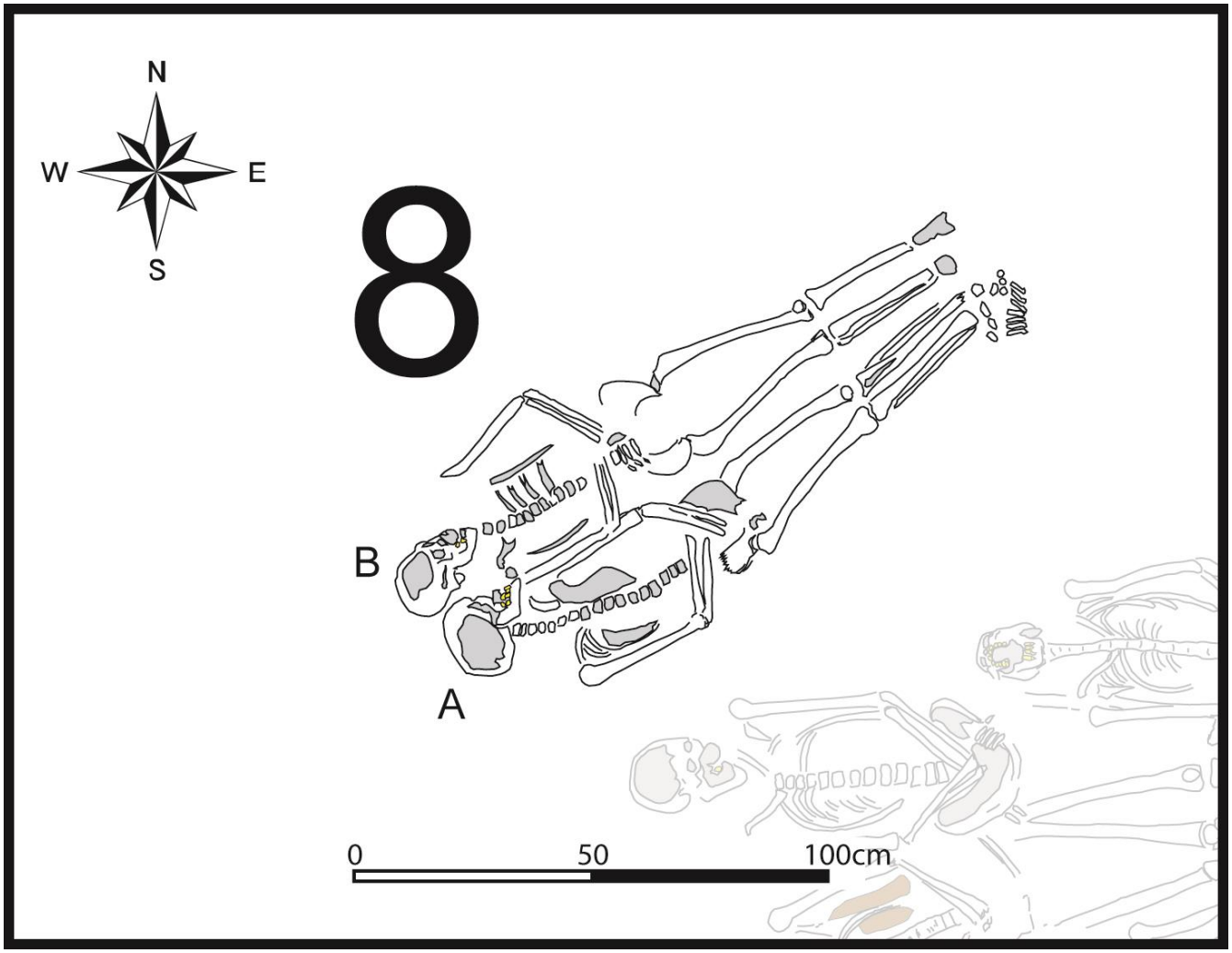

Plate A-9. Burial 8, two person burial: (A) extended burial on back, feet together, hands on pelvis, head rotated left and tilted forward, skeleton aligned WSW-NE (head to feet); (B) extended burial on back, hands on pelvis, head rotated left, skeleton aligned SW-ENE (head to feet).

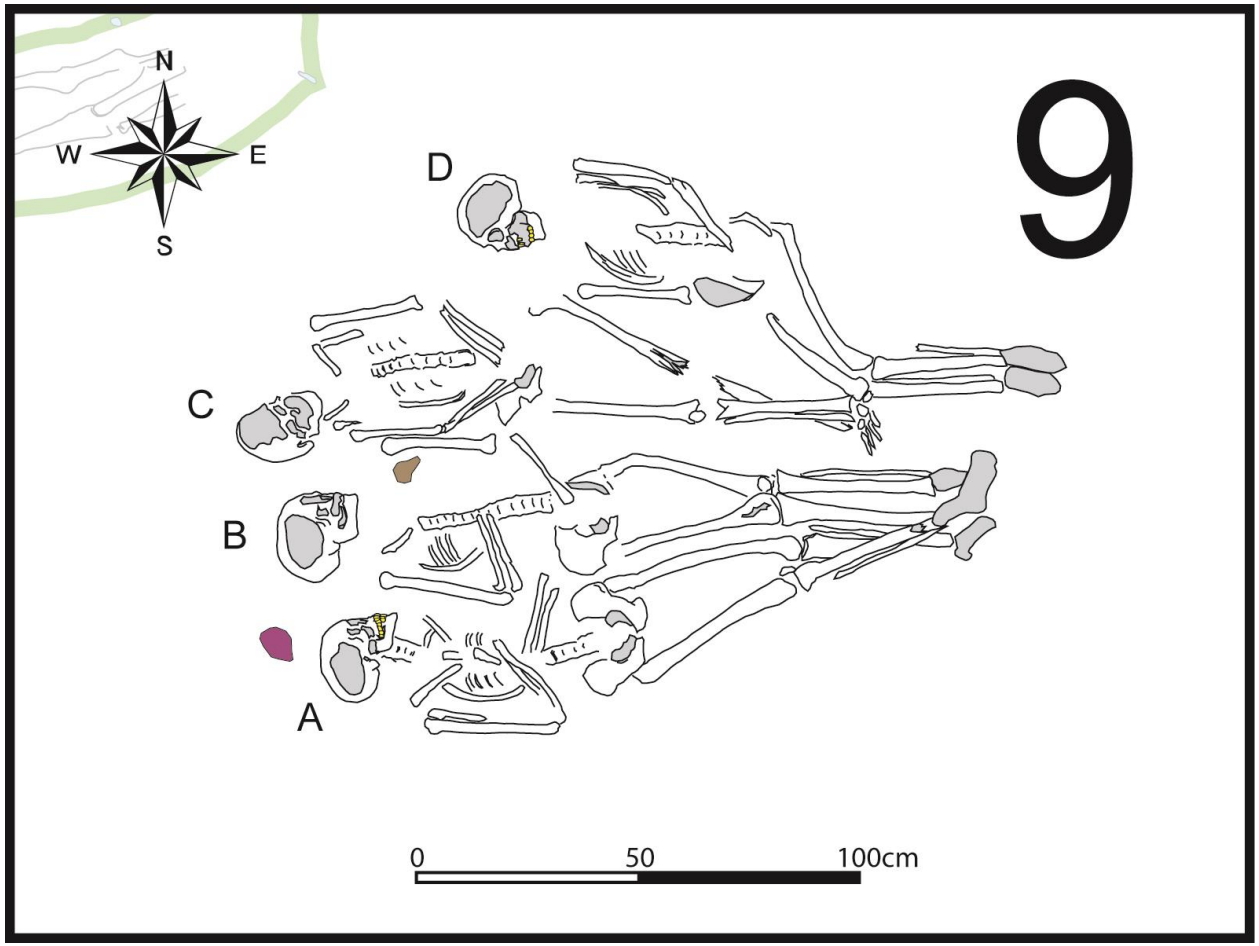

Plate A-10. Burial 9, four person burial: (A) semi-flexed burial on back, legs extended, ankles crossed right over left, hands on chest, head rotated left, skeleton aligned W-E (head to sacrum) with feet oriented ENE, whalebone fragment west of skull; (B) extended burial on back, knees together, hands mixed (left on pelvis, right on chest), head rotated left, skeleton aligned W-E (head to feet); (C) extended burial on back, ankles crossed right over left, hands on pelvis, head tilted to right shoulder, skeleton oriented WSW-E (head to sacrum) with feet oriented ESE (to accommodate 9D); (D) semi-flexed burial on back, knees collapsed right, feet together, hands on pelvis, head rotated right, skeleton aligned W-E (head to sacrum) with feet oriented ESE.

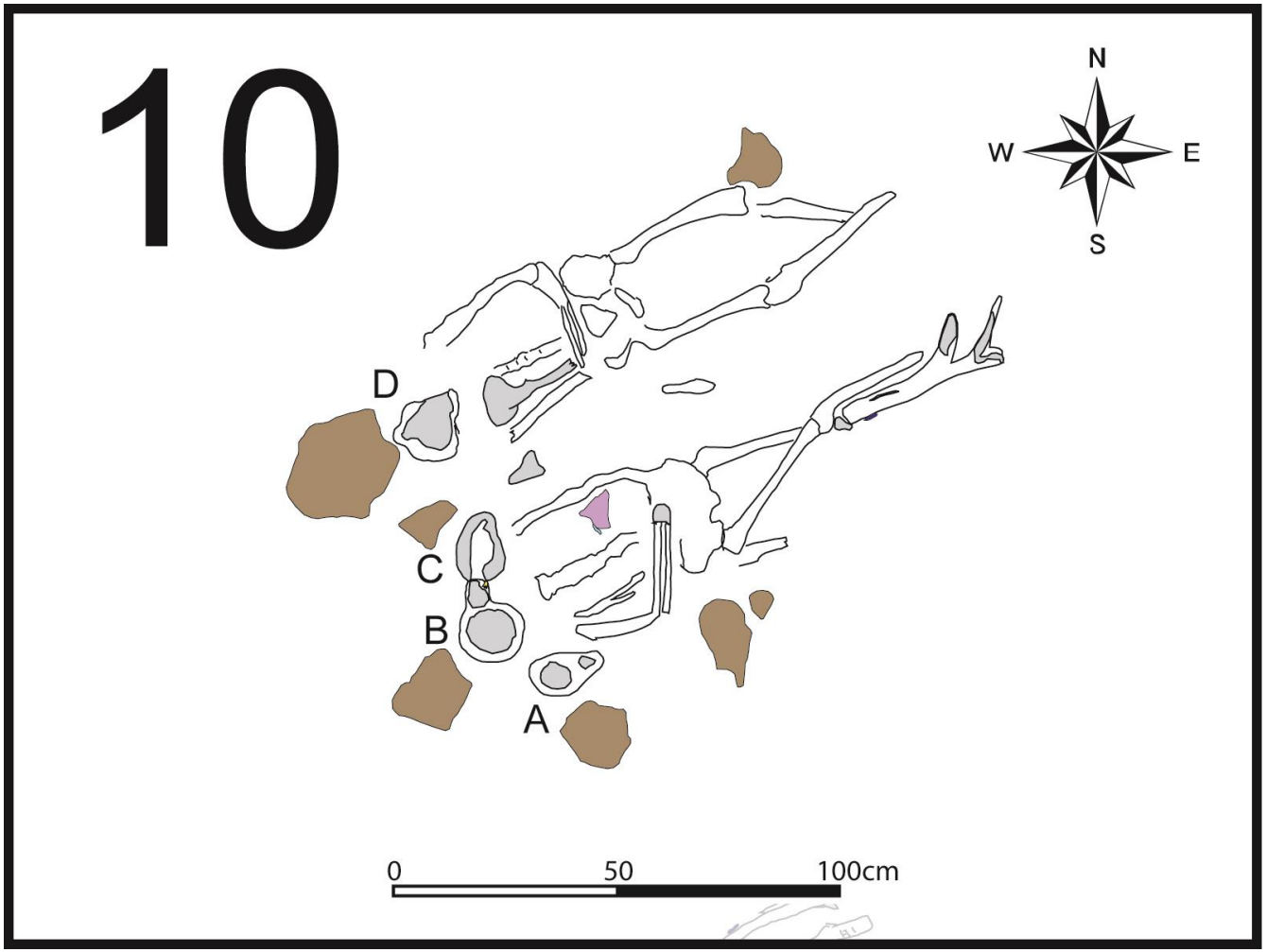

Plate A-11. Burial 10, four person burial: (A) buried on back with head oriented WSW; (B) extended supine burial, right knee semi-flexed to cross left leg, hands on pelvis, aligned WSW-ENE (head to feet), lead disc located along inside left tibia, artefacts include iron nail and baleen fragment between 10B's and 10C's torsos; (C) suggested alignment of WSW-ENE (head to femur); (D) extended burial, knees semi-flexed and collapsed laterally, ankles crossed right over left, arms cross over waist/pelvis, skeleton aligned WSW-ENE (head to feet).

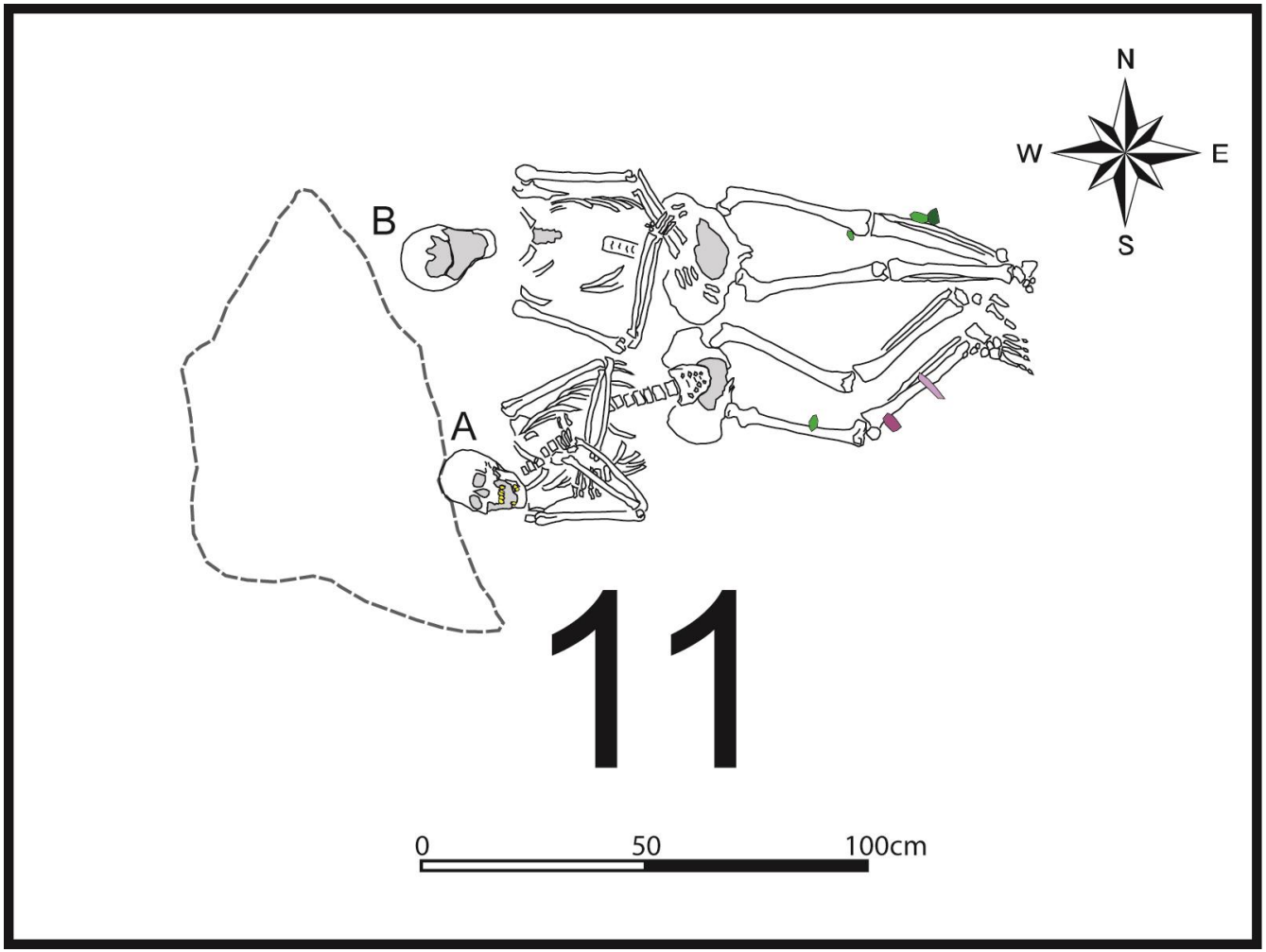

Plate A-12. Burial 11, two person burial: (A) semi-flexed burial on back, knees collapsed right, wrists crossed right over left with hands on chest, skull haphazard, skeleton aligned WSW-ENE (head to feet), artefacts include wood chip, baleen, and whalebone fragments on right leg; (B) extended burial on back, ankles crossed right over left, wrists cross right over left with hands on pelvis, head straightforward, skeleton aligned W-E (head to feet), artefacts include one charcoal and two wood fragments along left leg.

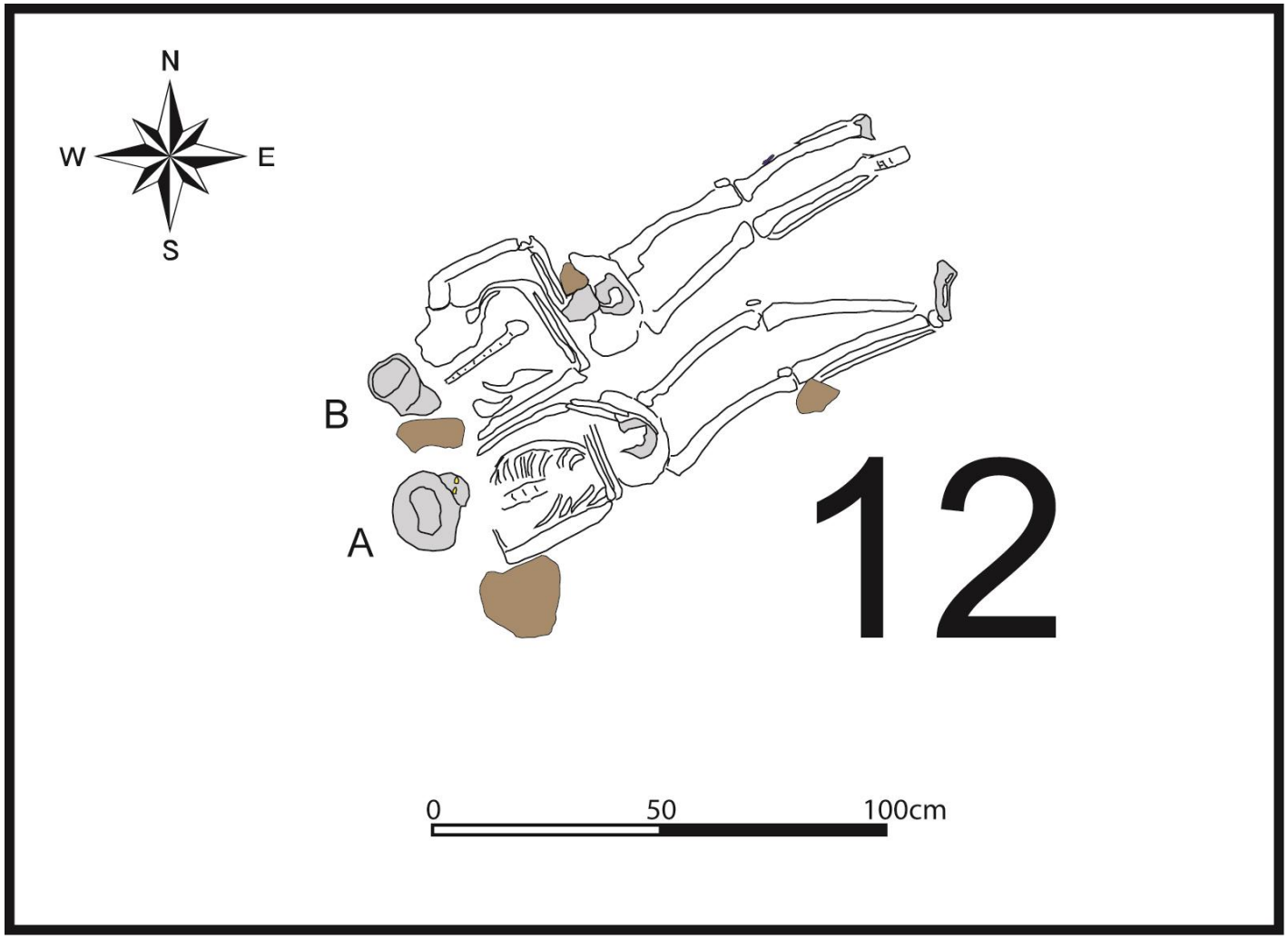

Plate A-13. Burial 12, two person burial: (A) extended burial on back, knees mixed (right extended, left semi-flexed), feet together, hands mixed (right on waist, left on pelvis), head rotated left, skeleton aligned WSW-ENE (head to feet); (B) extended burial on back, hands cross over waist, skeleton aligned WSW-ENE, lead disc along outside of left tibia.

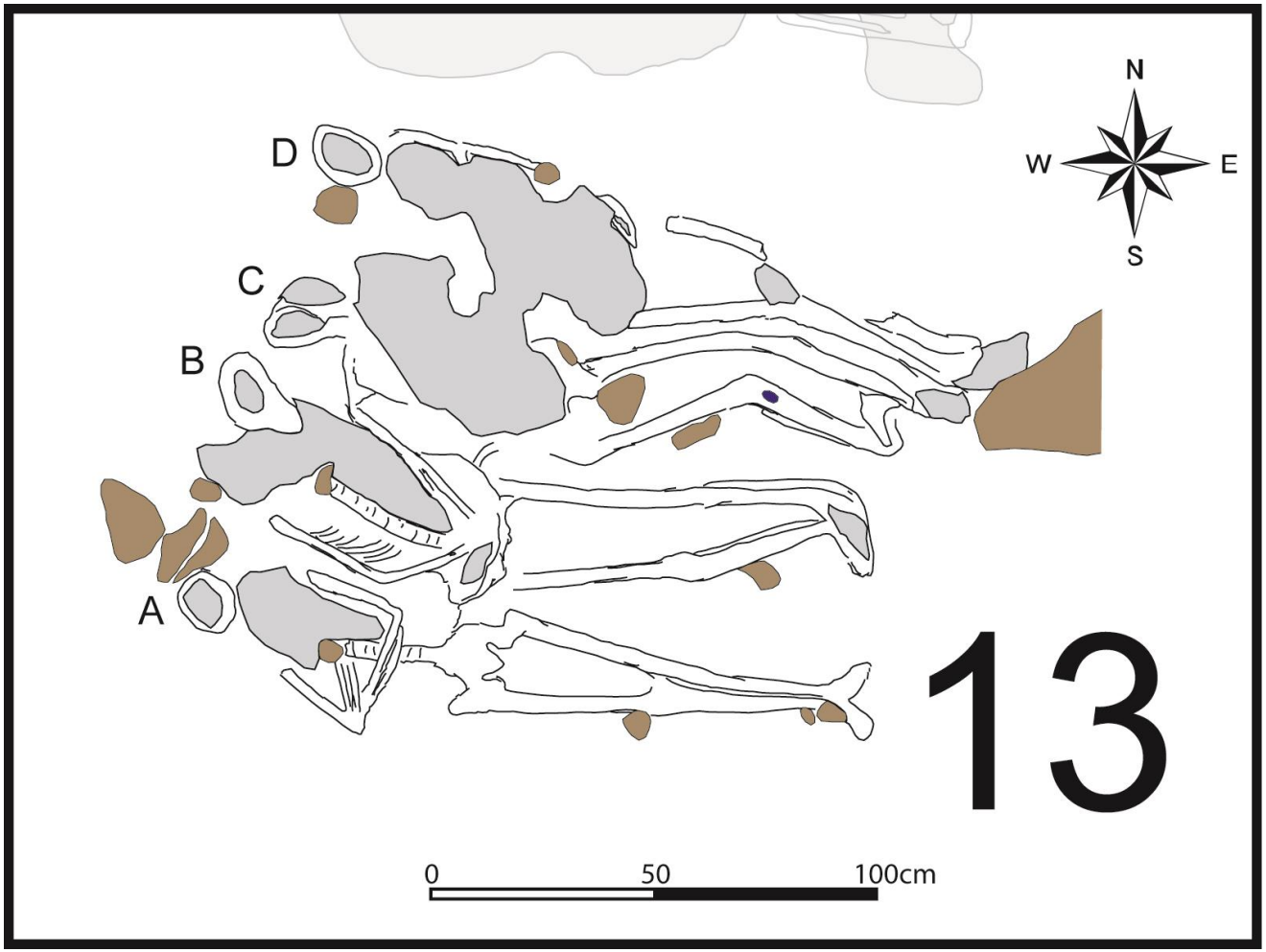

Plate A-14. Burial 13, four person burial: (A) extended burial on back, feet together, hands cross over chest, skeleton aligned WNW-ESE (head to sacrum) with feet oriented east; (B) semi-flexed burial on back, knees extended, feet together, hands on pelvis, skeleton aligned WNW-ESE (head to sacrum) with feet oriented east; (C) semi-flexed burial on back, knees collapsed left, skeleton aligned WNW-ESE (head to sacrum) with feet oriented east, lead disc on upper right tibia; (D) semi-flexed burial on back, right knee collapsed left, left extended), feet together, skeleton aligned WNW-ESE (head to feet).

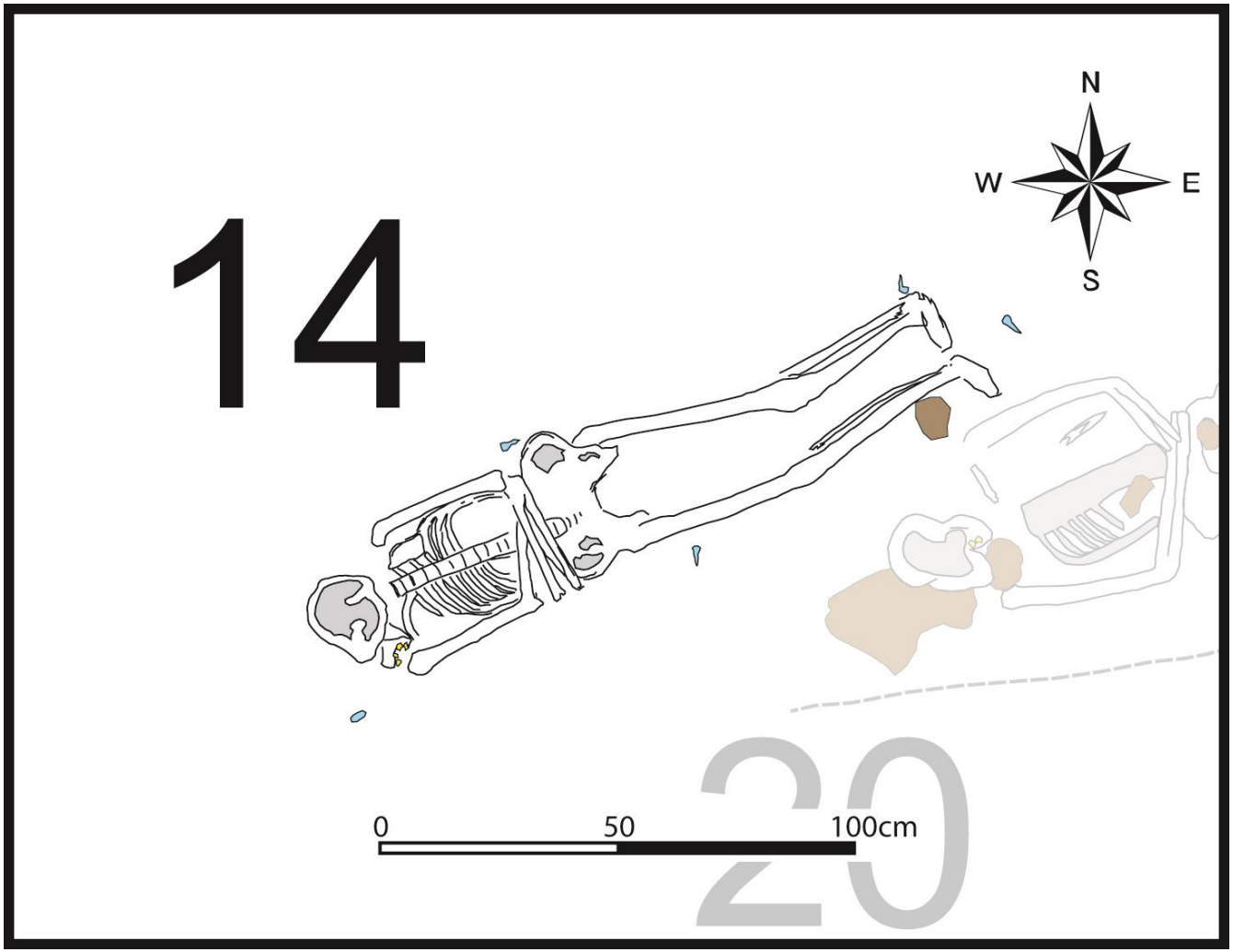

Plate A-15. Burial 14, one person burial: coffin burial, extended on back, arms cross over waist, head rotated right, skeleton and coffin aligned WSW-ENE (head to feet), artefacts include iron nails (5) indicating coffin outline around body. Unmapped artefacts include a lead disc located on the lower left leg (Kennedy 1997:2).

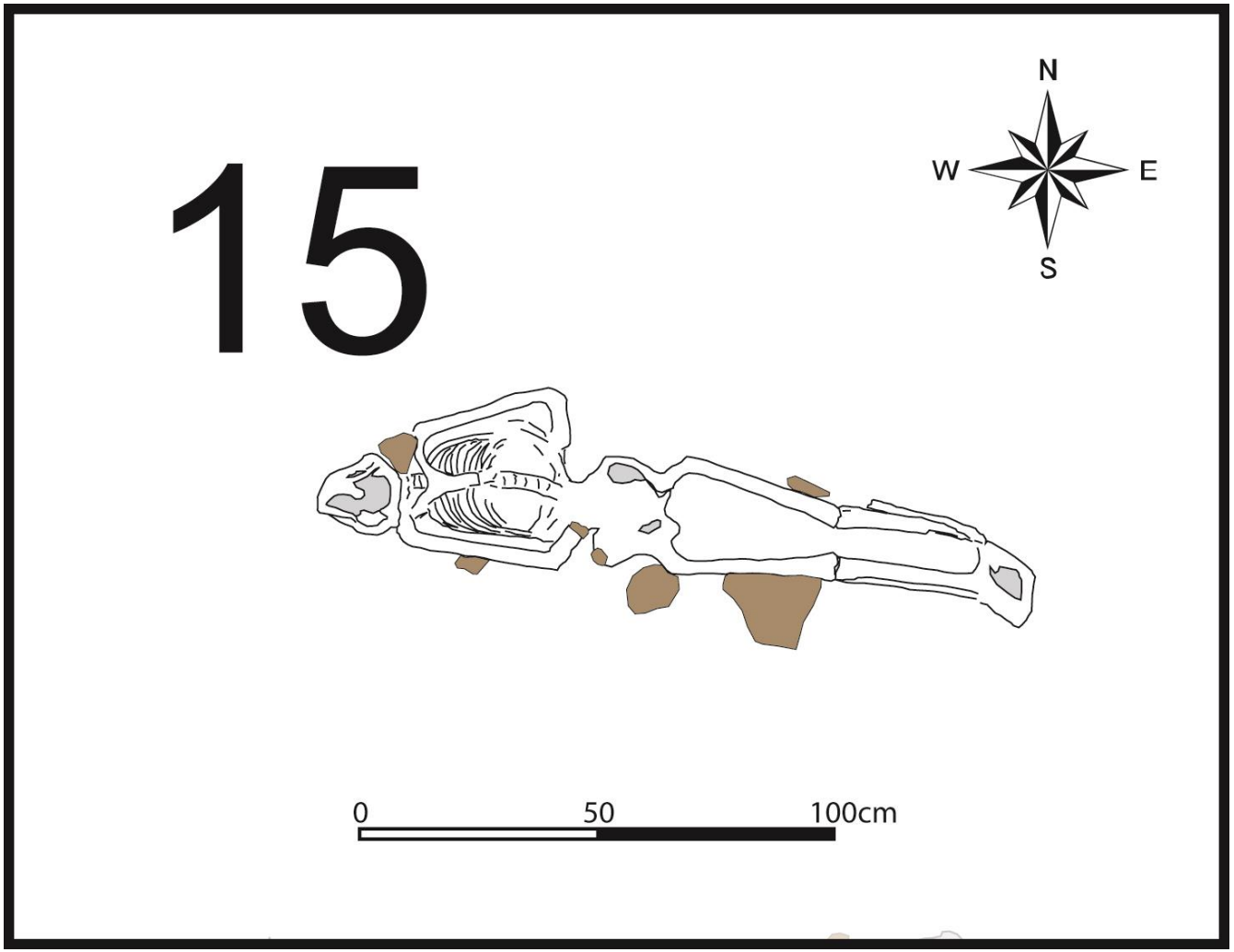

Plate A-16. Burial 15, one person burial: extended on back, feet together, hands mixed (right on pelvis, left on waist), skeleton aligned W-E (head to feet).

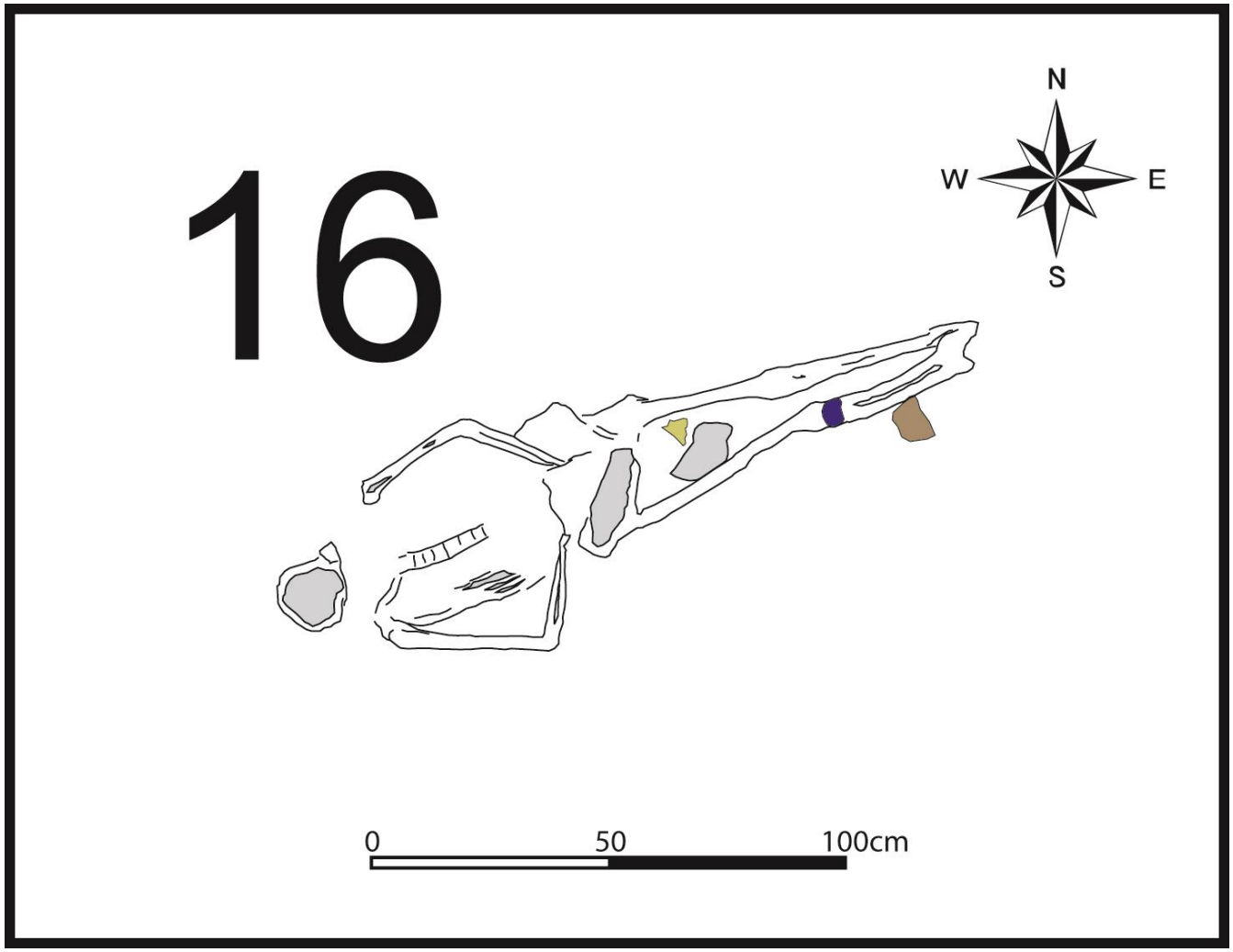

Plate A-17. Burial 16, one person burial: extended on back, feet together, hands on pelvis, skeleton aligned WSW-ENE (head to feet), lead disc on upper right tibia, textile fragment between thighs.

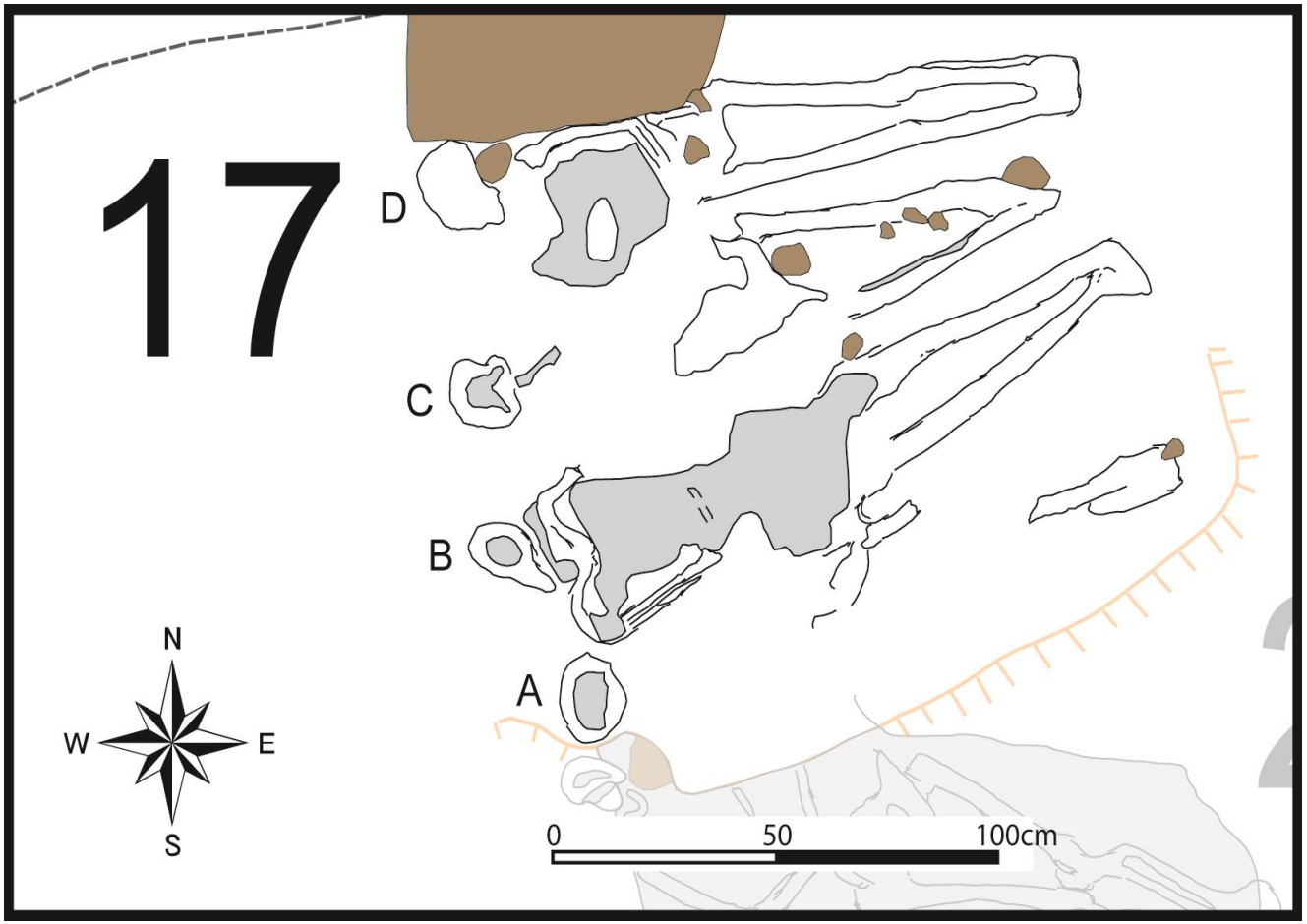

Plate A-18. Burial 17, four person burial: (A) extended burial on back, feet together, skeleton aligned WSW-ENE (head to feet); (B) extended burial on back, feet together, right arm crosses chest, skeleton aligned WSW-ENE (head to feet); (C) extended burial on back, feet together, skeleton aligned WSW-ENE (head to feet); (D) extended burial on back, feet together, left hand on right pelvis, skeleton aligned WSW-ENE (head to feet). Map illustrates where Burial 17 intrudes on existing Burial 21, and where individual 17A overlaps 21. Orange line depicts excavation boundaries around Burial 21, illustrating where Burial 17 intruded on existing Burial 21, specifically how individual 17A overlaps Burial 21. See Burial 21 for clearer detail of excavation boundaries.

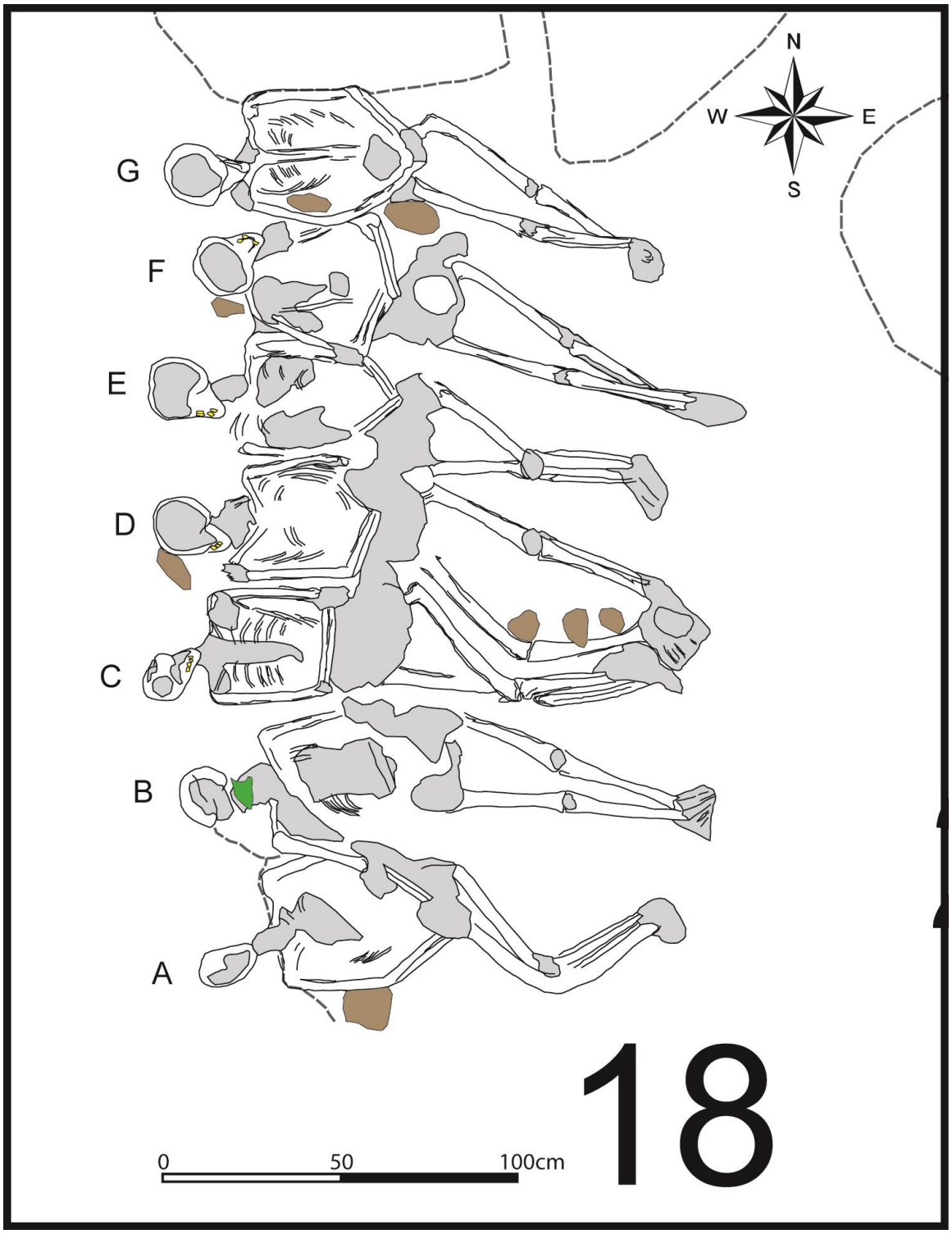
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Plate A-19. Burial 18, seven person burial: (A) semi-flexed burial on back, knees collapsed right, feet together, hands on pelvis, skeleton aligned WSW-ENE (head to sacrum) with feet oriented east; (B) extended burial on back, left leg angled slightly south to position feet together, hands on pelvis, skeleton aligned W-E (head to feet), wood fragment over neck; (C) extended burial on back, knees mixed (right extended, left semi-flexed and collapsed right), feet together, hands mixed (right over left elbow, left on pelvis), head tilted to right shoulder, skeleton aligned W-E (head to feet); (D) semi-flexed burial on back, knees mixed (right semi-flexed and collapsed right, left extended), wrists cross with hands on pelvis, head rotated right, skeleton aligned W-E (head to sacrum) with feet oriented ESE; (E) extended burial on back, knees mixed (right extended, left semi-flexed and collapsed right), wrists cross with hands on pelvis, head rotated right, skeleton aligned WNW-ESE (head to feet); (F) extended burial on back, ankles cross right over left, wrists cross with hands on pelvis, skeleton aligned W-E (head to sacrum) with feet oriented ESE; (G) semi-flexed burial on back, knees extended, ankles cross right over left, hands on pelvis, skeleton aligned W-E (head to sacrum) with feet oriented ESE.

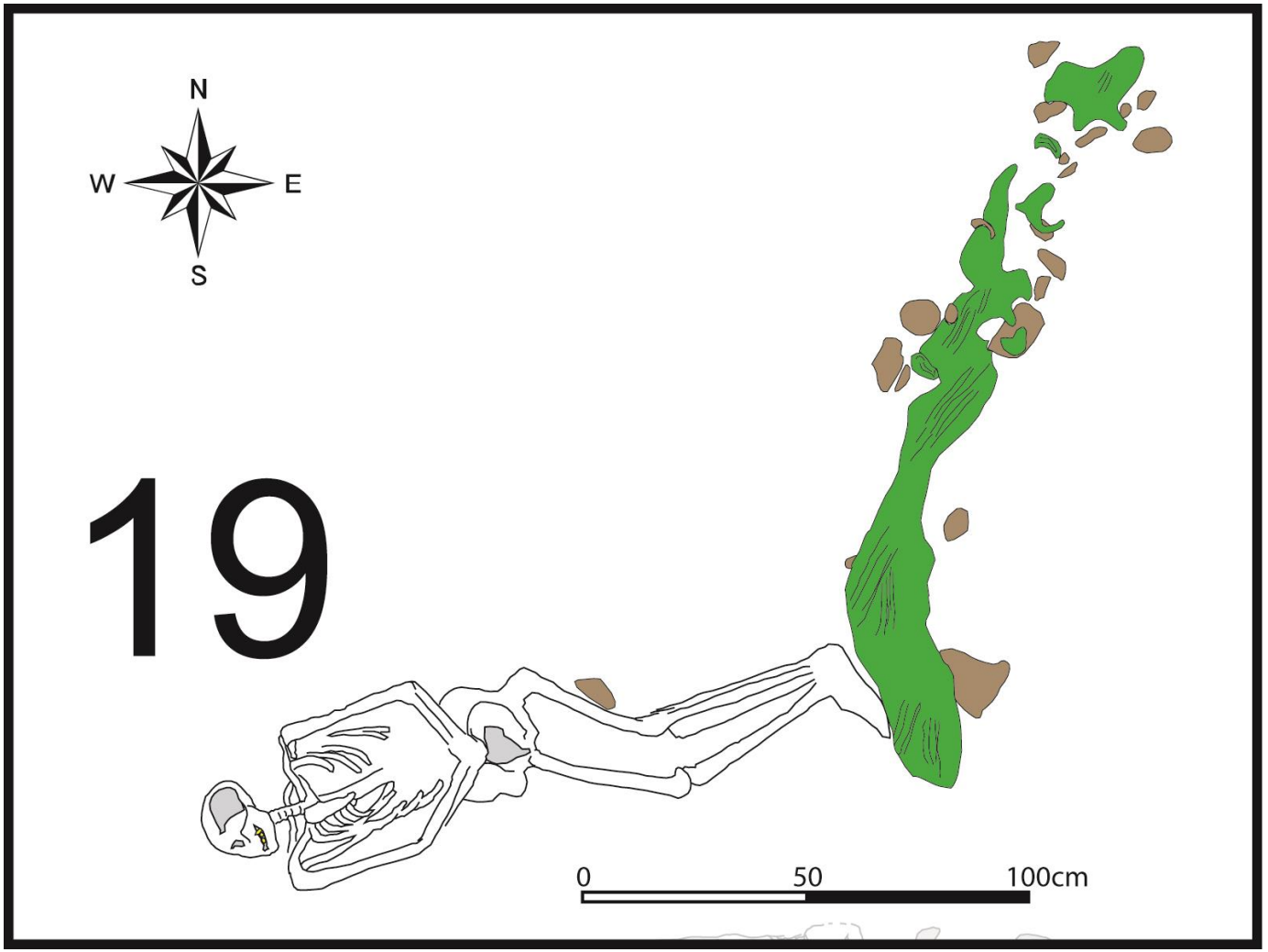

Plate A-20. Burial 19, single person burial: semi-flexed burial on back, knees collapsed right, feet together, hands cross over pelvis, head rotated right, skeleton aligned WSW-ENE (head to feet). Note: Feature 3 is a large wood stain located near Burial 19's feet, aligned N-S. It is not known if or how Feature 3 relates to Burial 19.

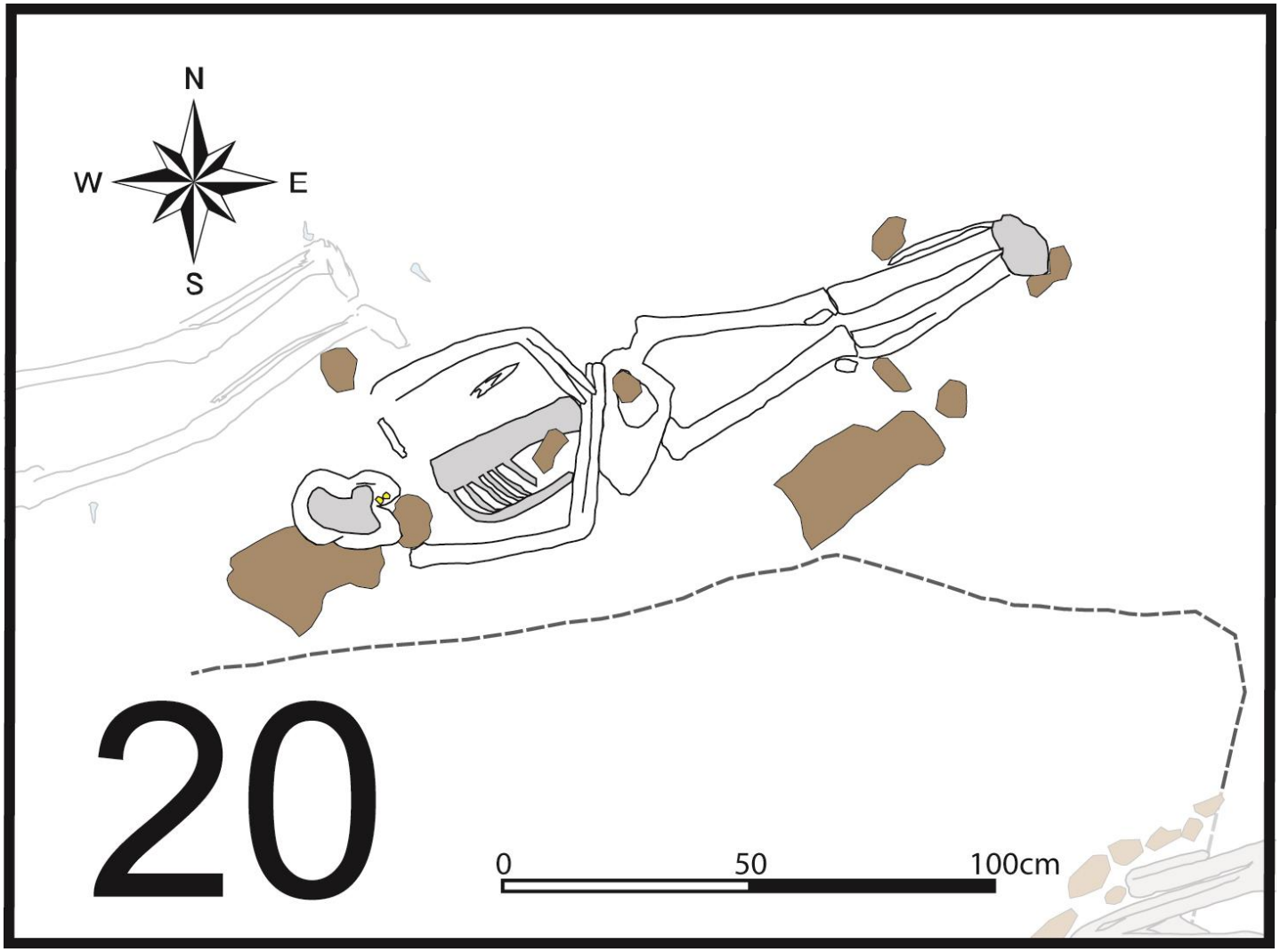

Plate A-21. Burial 20, single person burial: extended burial on back, feet together, wrists cross left over right with hands on pelvis, skeleton aligned WSW-ENE (head to feet).

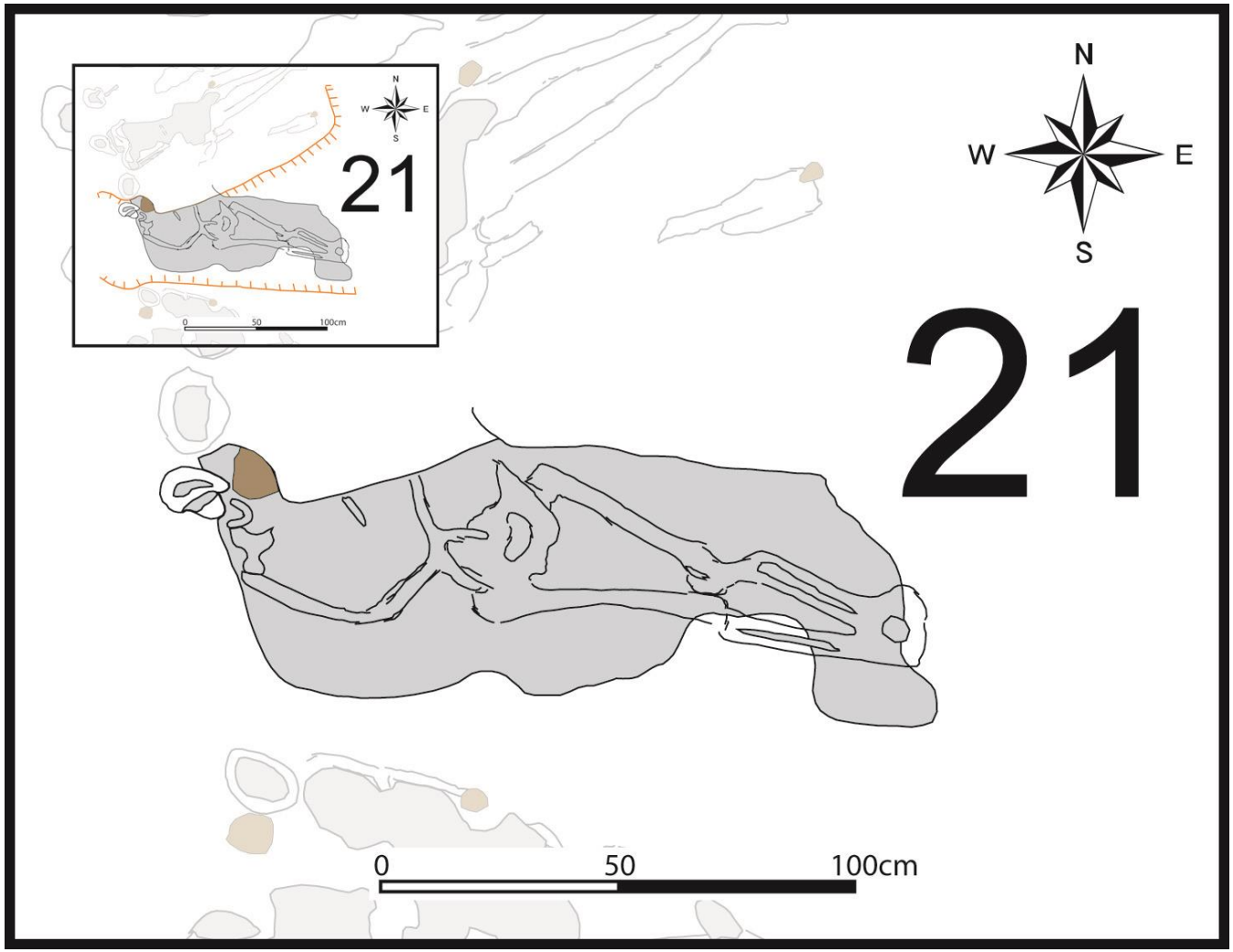

Plate A-22. Burial 21, single person burial: extended burial on back, feet together, wrists cross with hands on pelvis, skeleton aligned W-E (head to scrum) and feet oriented ESE. Inset depicts excavation boundaries and illustrates intrusion of Burial 17 into Burial 21. Burial 21 is buried deeper than adjacent Burials 13 and 17, and partially beneath individual 17A.

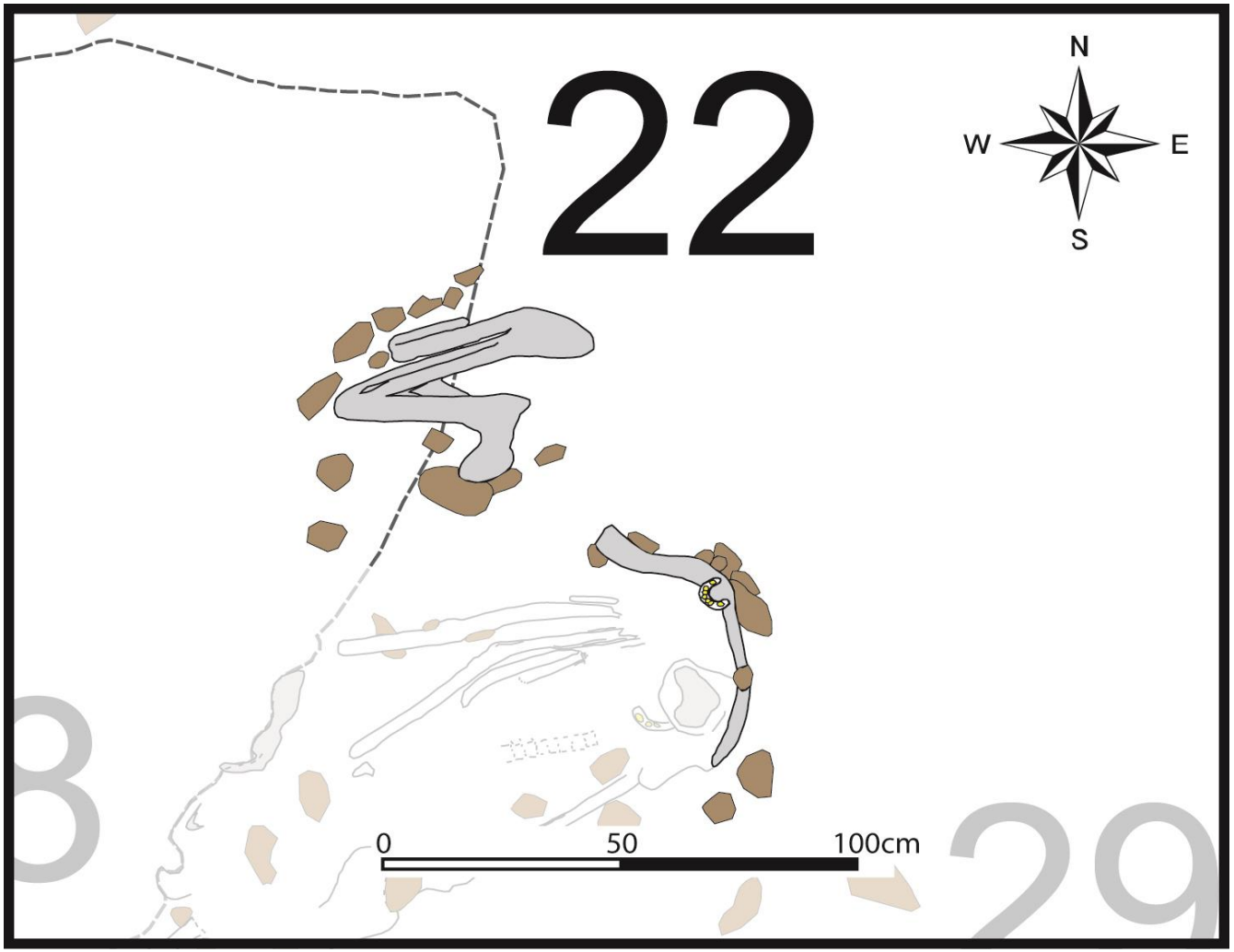

Plate A-23. Burial 22, single person burial: disturbed burial, disarticulated remains, knees flexed. Additional remains found at the NE extent of Burial 28 suggests how Burial 22 became disarticulated during interment of Burial 28. Intrusion appears to affect Burial 22's upper body. A mandible and (possible) long bone originally assigned to individual 28D in the field are likely the disturbed remains of Burial 22. There is no individual 28D.

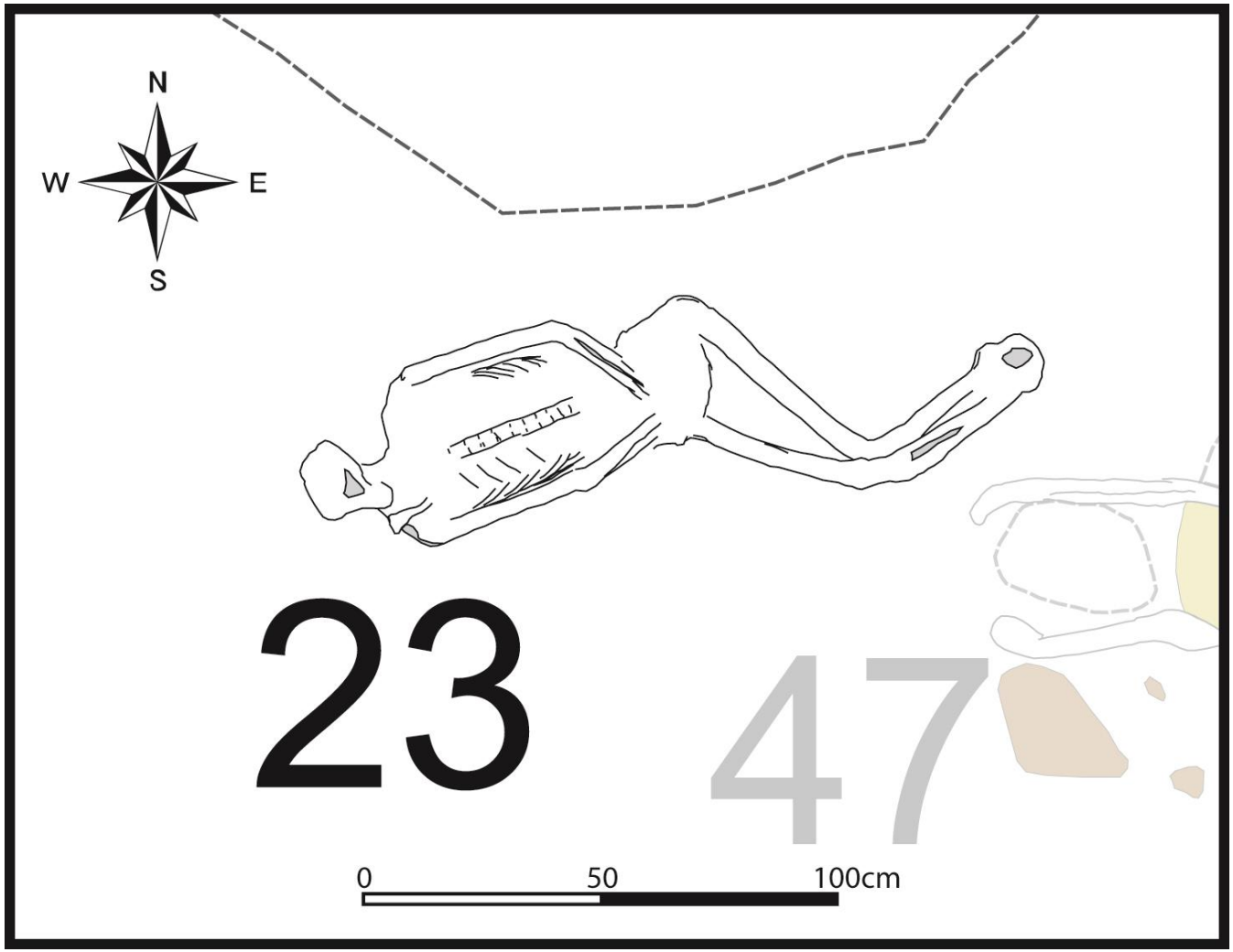

Plate A-24. Burial 23, single person burial: semi-flexed burial on back, knees collapsed to right, feet together, hands on pelvis, head rotated right, skeleton aligned WSW-ENE (head to sacrum) and feet oriented east.

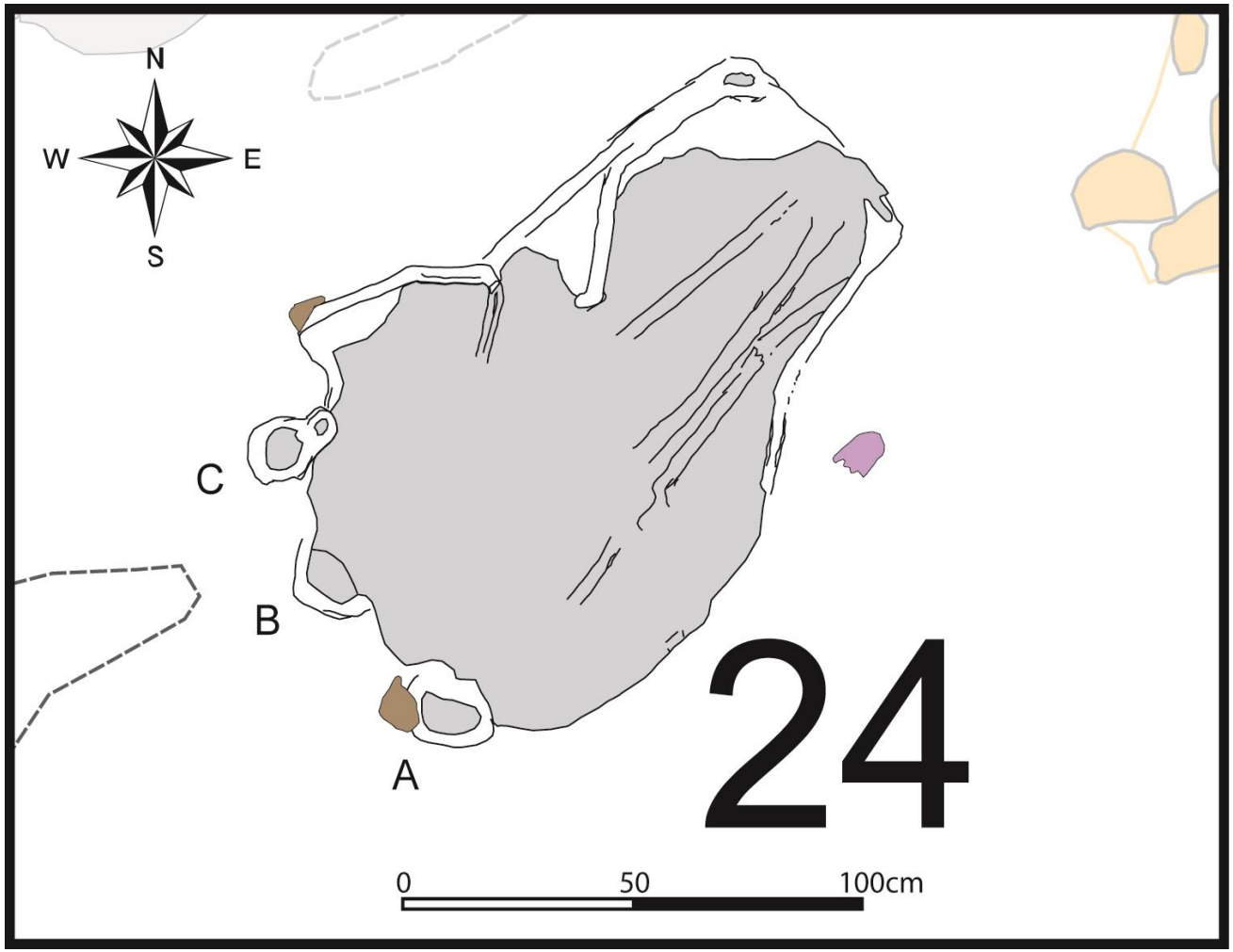

Plate A- 25. Burial 24, three person burial: (A) possible semi-flexed burial on back, legs extended, ankles crossed right over left, skeleton aligned SW-NE (head to sacrum) and feet oriented NNE, baleen fragment east of right leg; (B) extended burial on back, feet apart, skeleton aligned WSW-ENE (head to sacrum) and feet oriented NE; (C) semi-flexed burial on back, knees mixed (right collapsed left, left extended), feet together, hands on pelvis, skeleton aligned WSW-ENE (head to sacrum) and feet oriented NE.

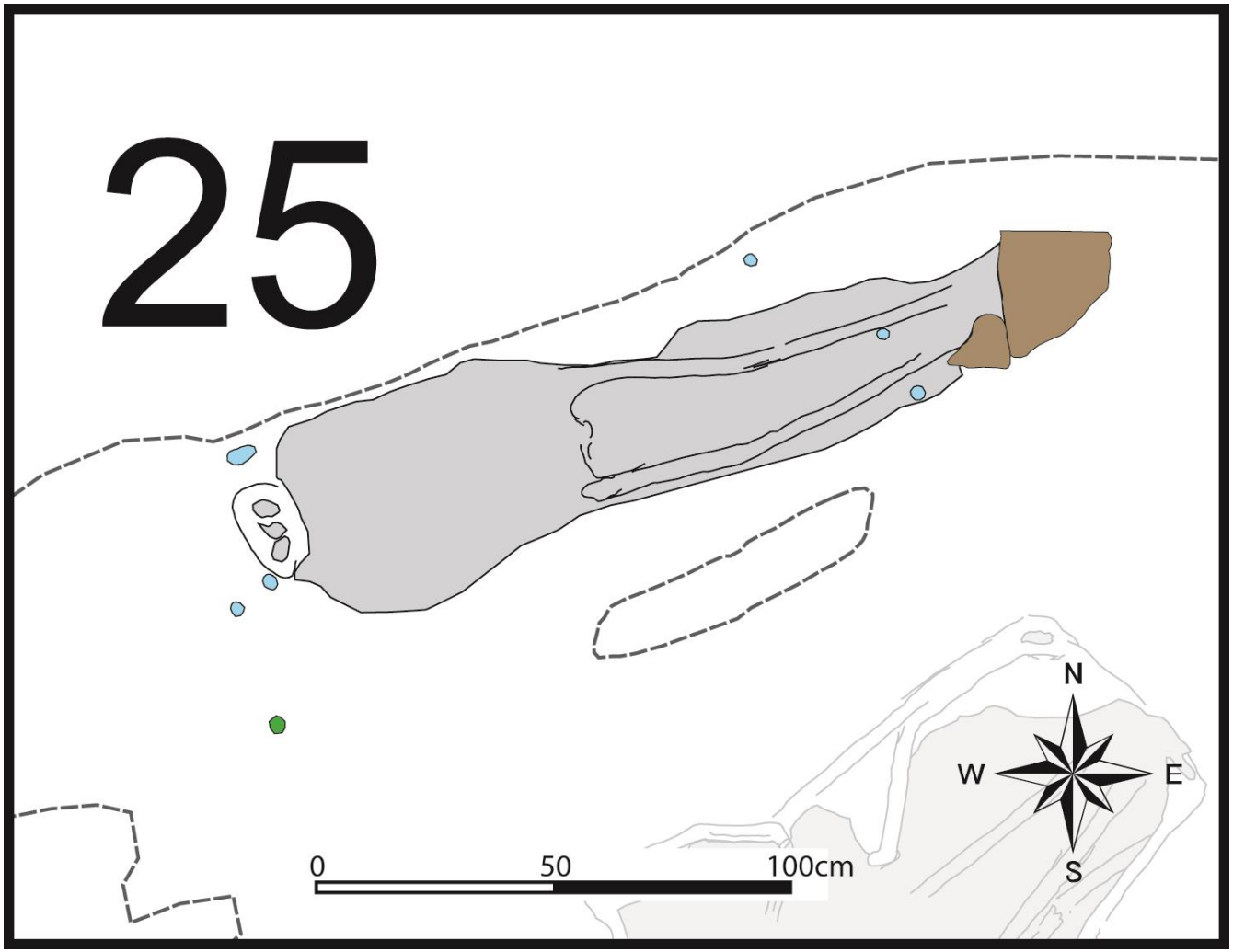

Plate A-26. Burial 25, single person burial: coffin burial, extended on back, skeleton aligned WSW-ENE (head to feet), artefacts include wood, two nails, and four combined nail with wood fragments which represent the coffin structure. Shallow burial suggests coffin lid was flush with ground surface with soil piled on top.

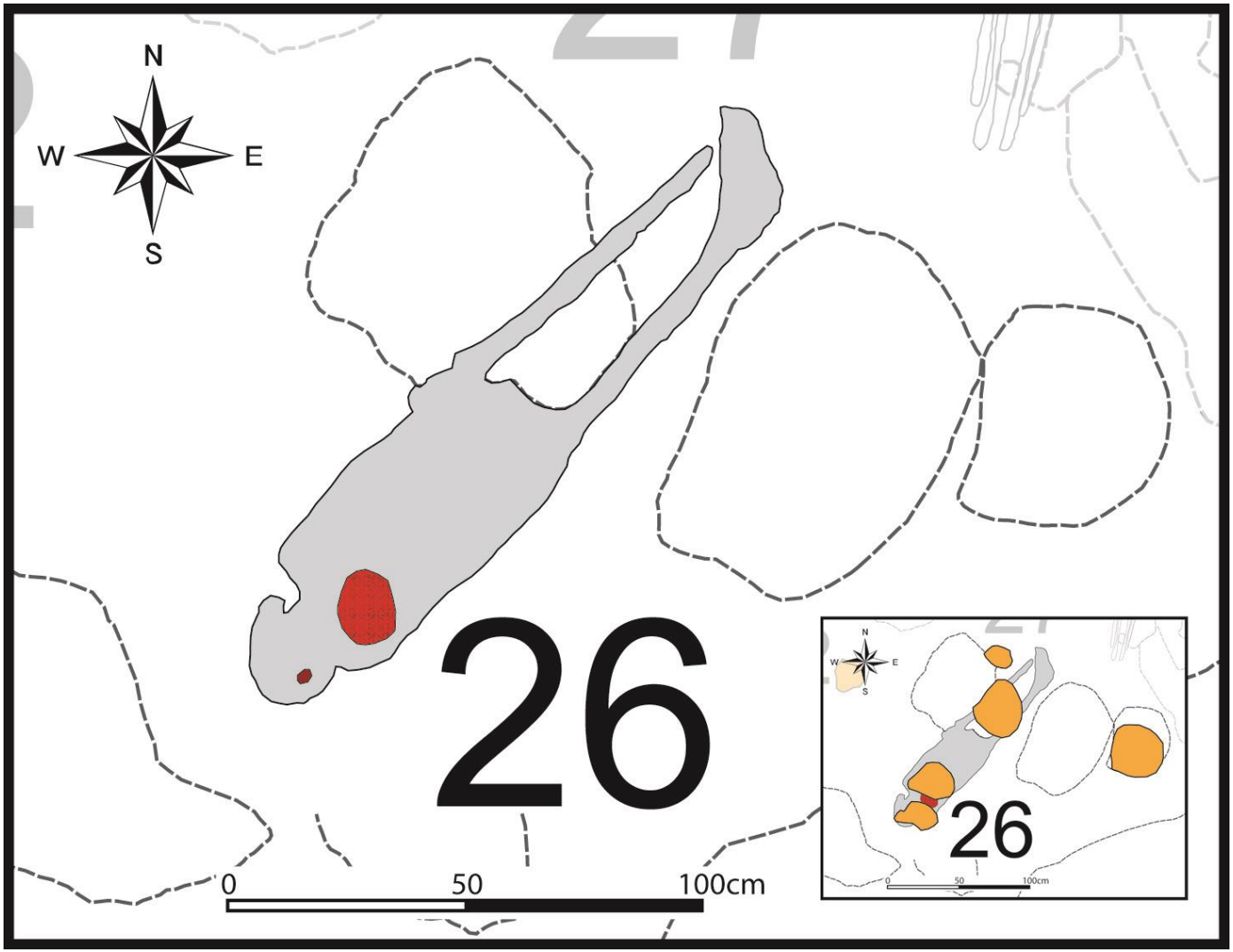

Plate A-27. Burial 26, single person burial: extended burial on back, knees parallel, aligned SW-NE (head to feet), roof tile on right shoulder, ceramic fragment on skull. Inset depicts grave marker rocks.

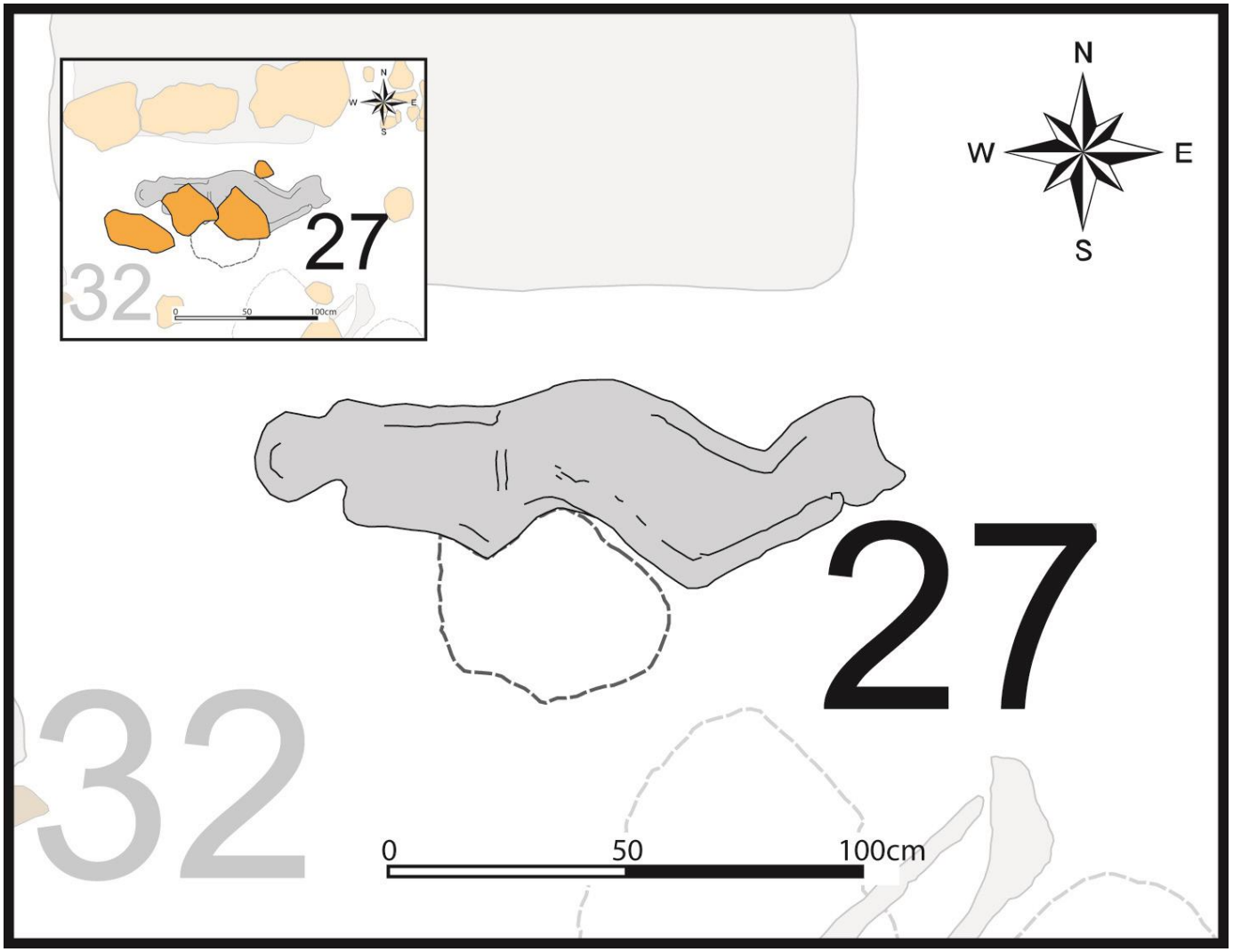

Plate A-28. Burial 27, single person burial: semi-flexed burial on back, knees collapsed right, feet apart, hands on pelvis, aligned W-E (head to feet), iron nail recovered (unmapped). Inset depicts grave marker rocks.

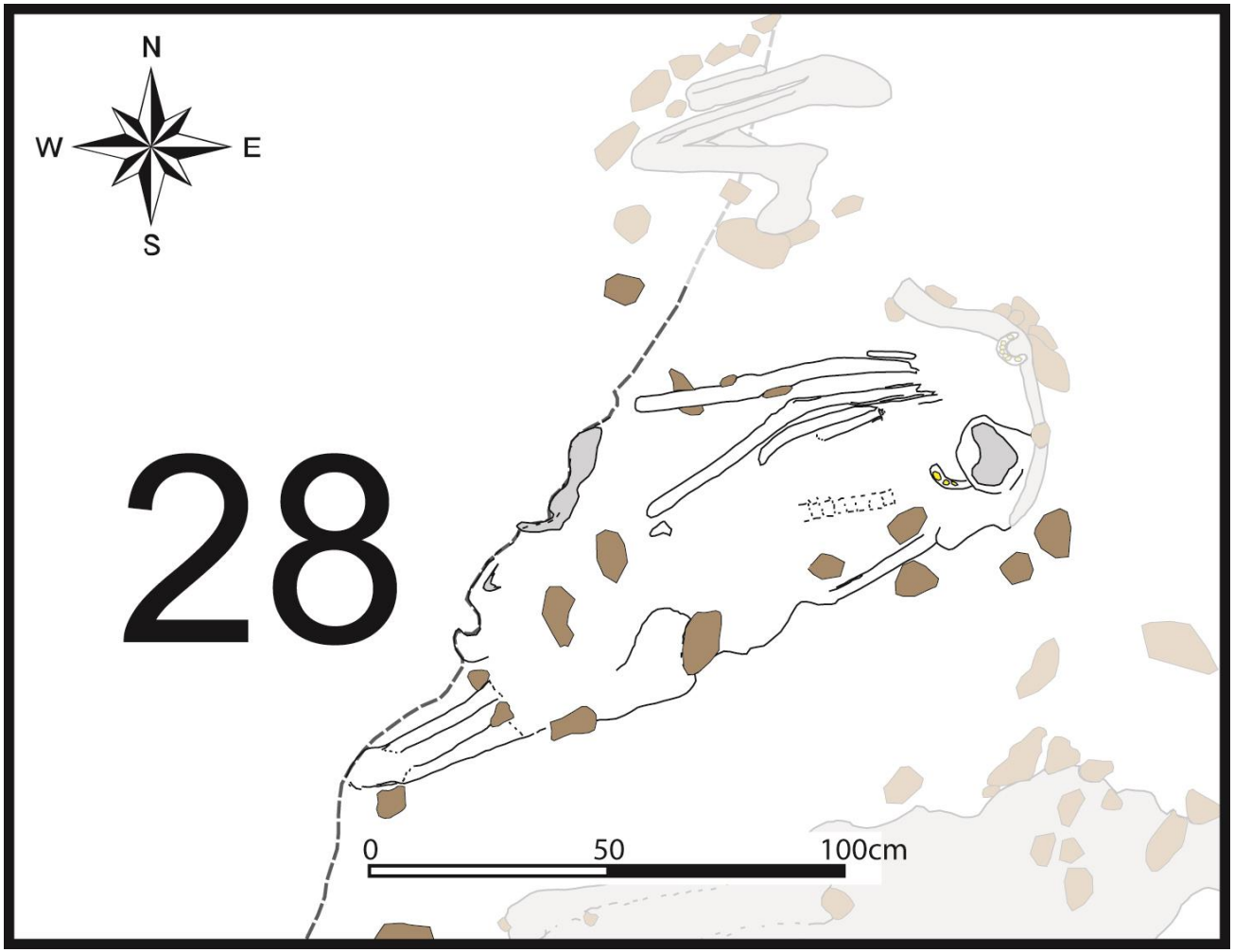

Plate A-29. Burial 28, three person burial: (A) poorly preserved individual, roughly aligned SW-ENE (head to feet?); (B) extended burial on back, feet together, roughly aligned SW-ENE (head to feet?); (C) extended burial on back, aligned ENE-WSW (head to feet); ("D", or faint elements at NE extent of burial) mandible and possible long bone assigned to 28D in the field actually belong to disarticulated Burial 22, Burial 28 intruded on Burial 22 in the chest region and disturbed skeletal elements.

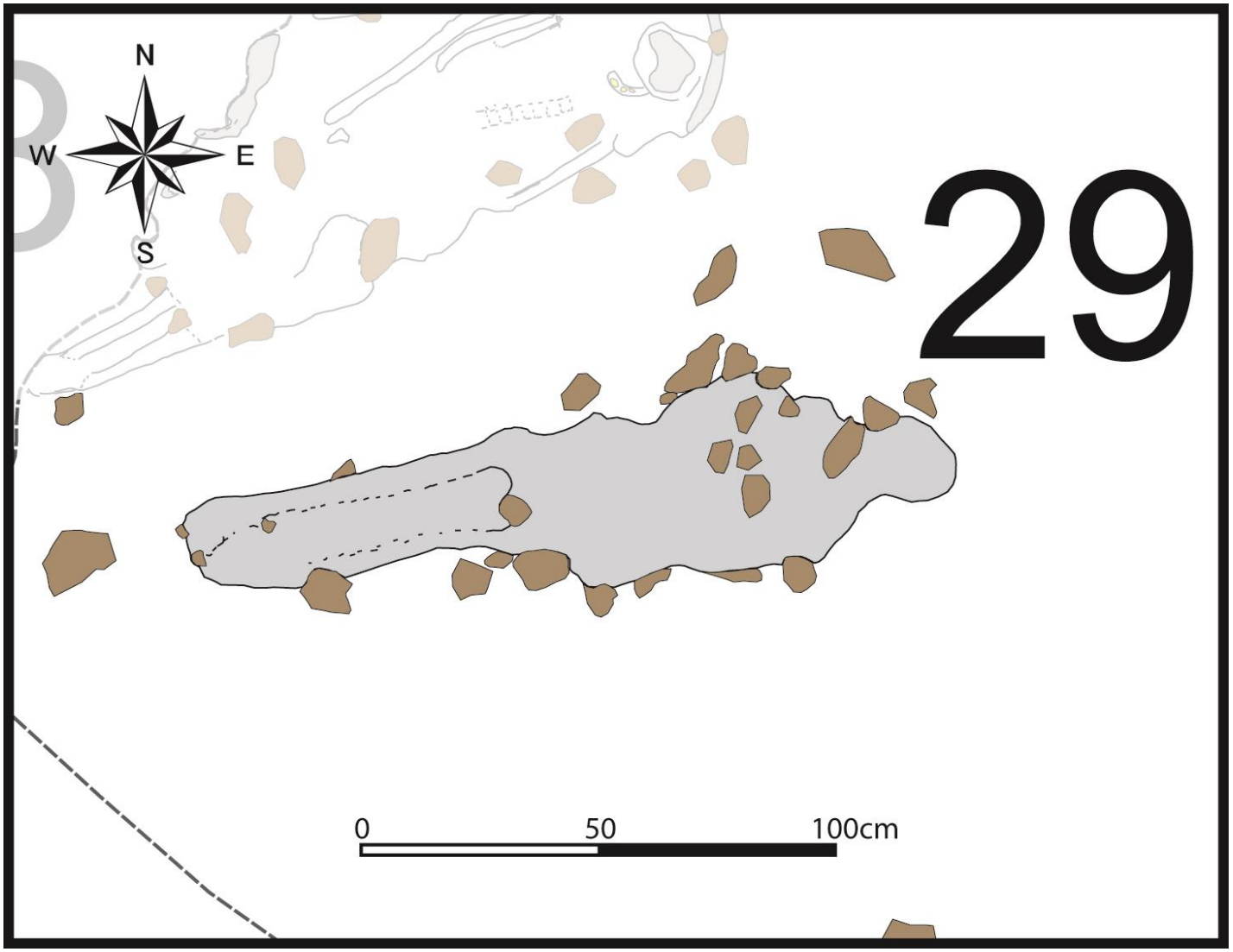

Plate A-30. Burial 29, single burial: extended burial on back, knees parallel, aligned E-W (head to feet).

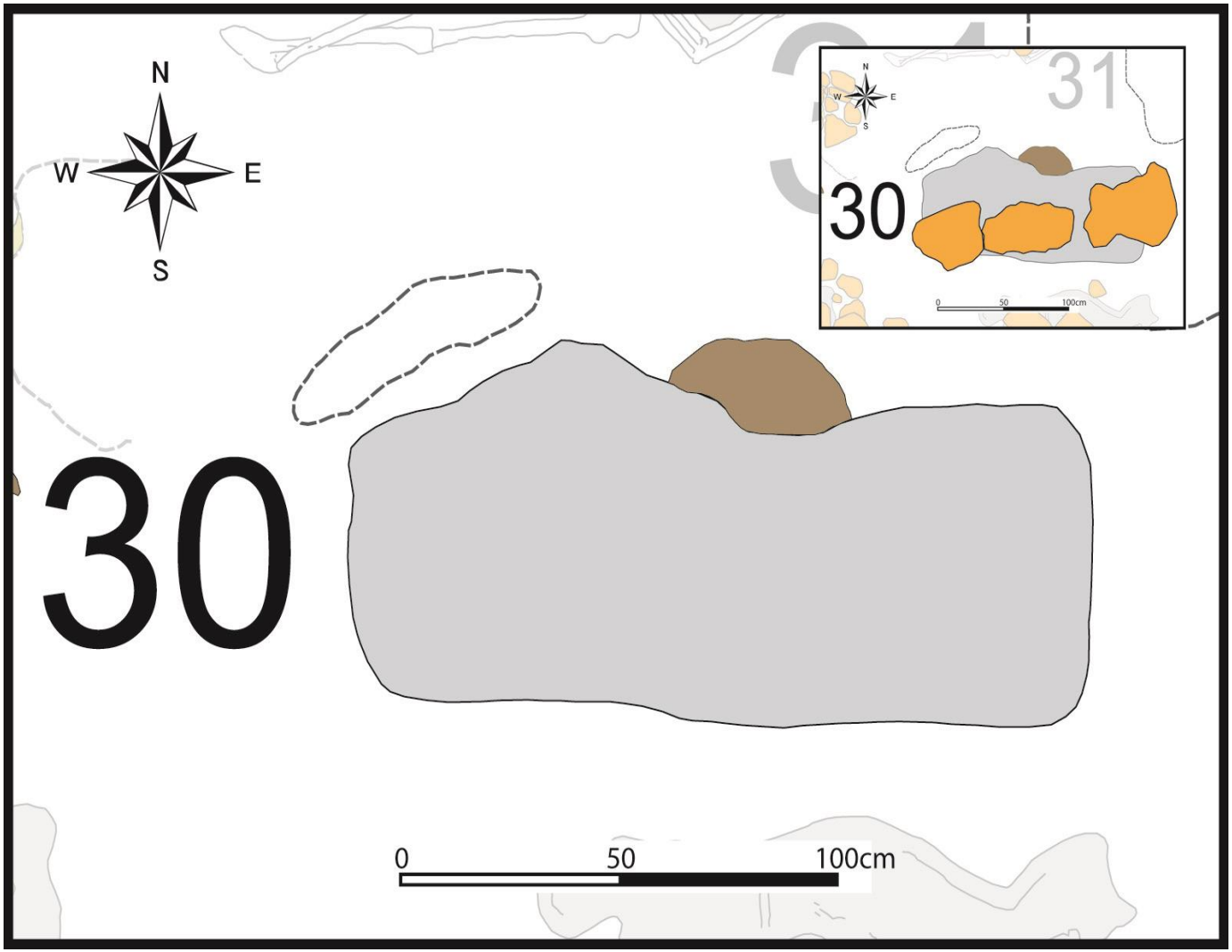

Plate A-31. Burial 30, single person burial: represented by an organic outline, aligned W-E (outline). Organic stain suggests extended burial position and dimensions that could accommodate more than one individual, no skeletal remains recovered. Inset depicts grave marker rocks.

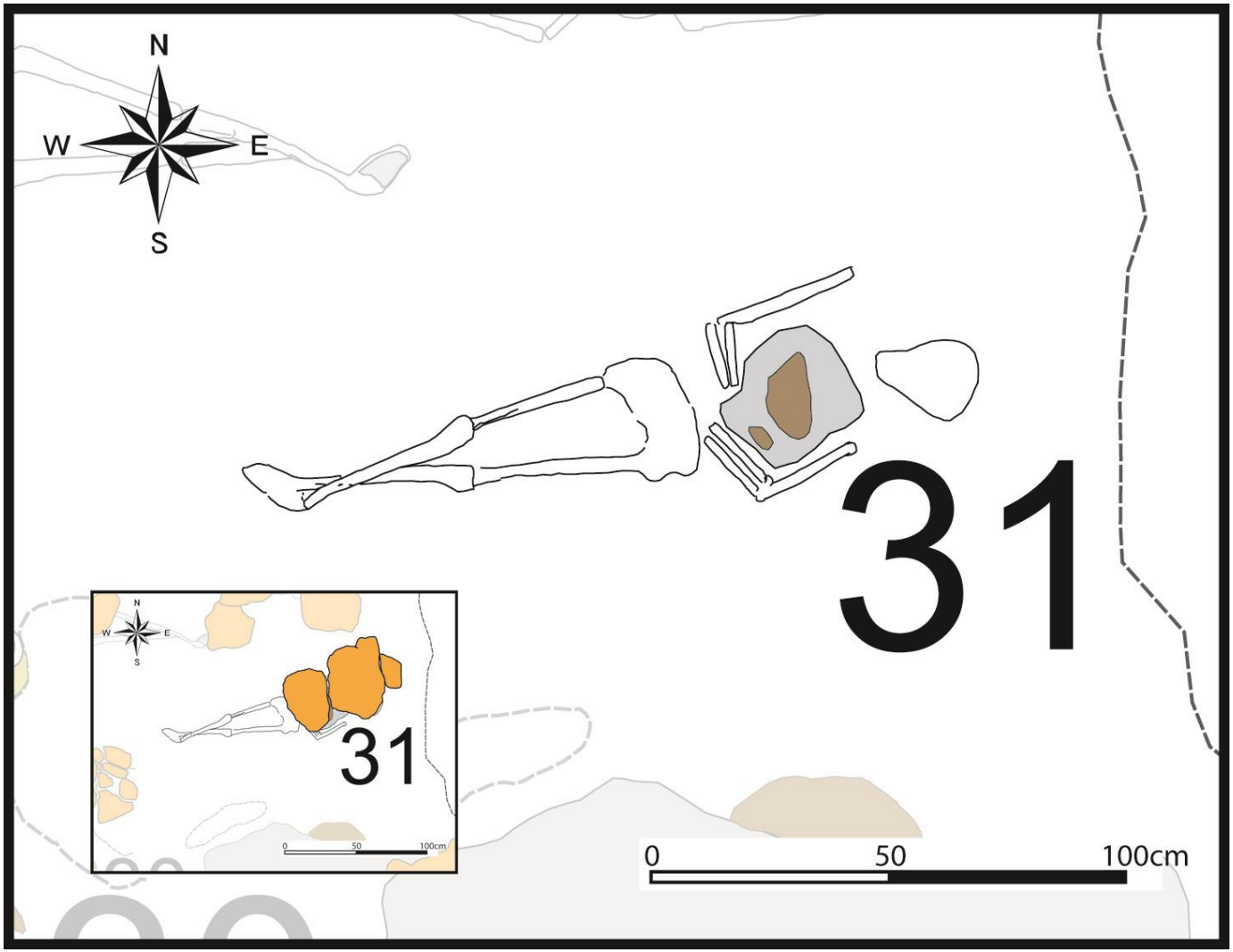

Plate A-32. Burial 31, single person burial: extended burial on back, ankles crossed right over left, hands on waist, aligned E-W (head to feet), "indiscernible organic" stain within chest area, artefacts include iron nail (unmapped). Inset depicts grave marker rocks.

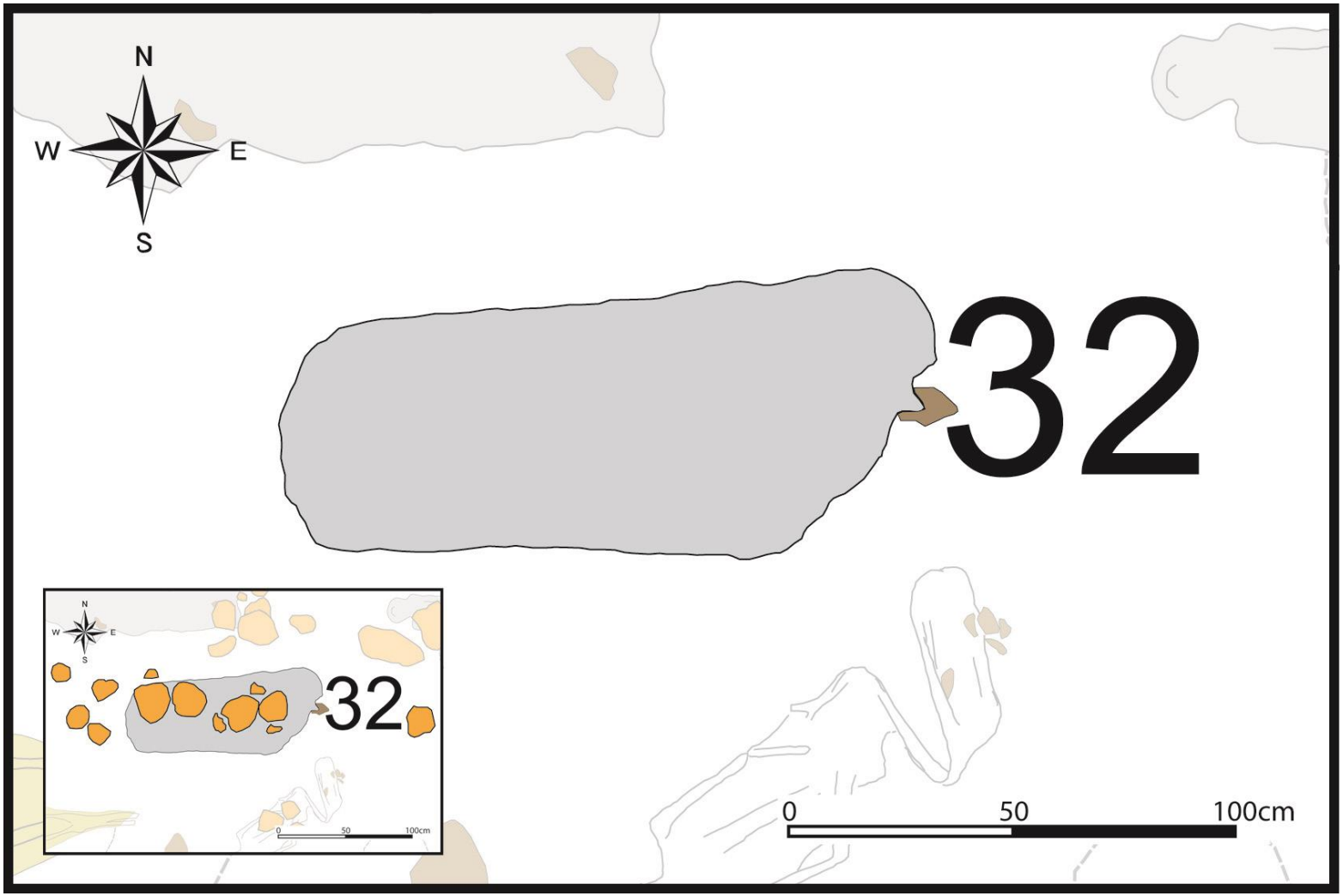

Plate A-33. Burial 32, single person burial: represented by an organic outline, aligned W-E (outline). Organic stain suggests extended burial position and dimensions that could accommodate more than one individual, or possible coffin burial, no skeletal remains recovered, artefacts include baleen fragment (unmapped). Inset depicts grave marker rocks.

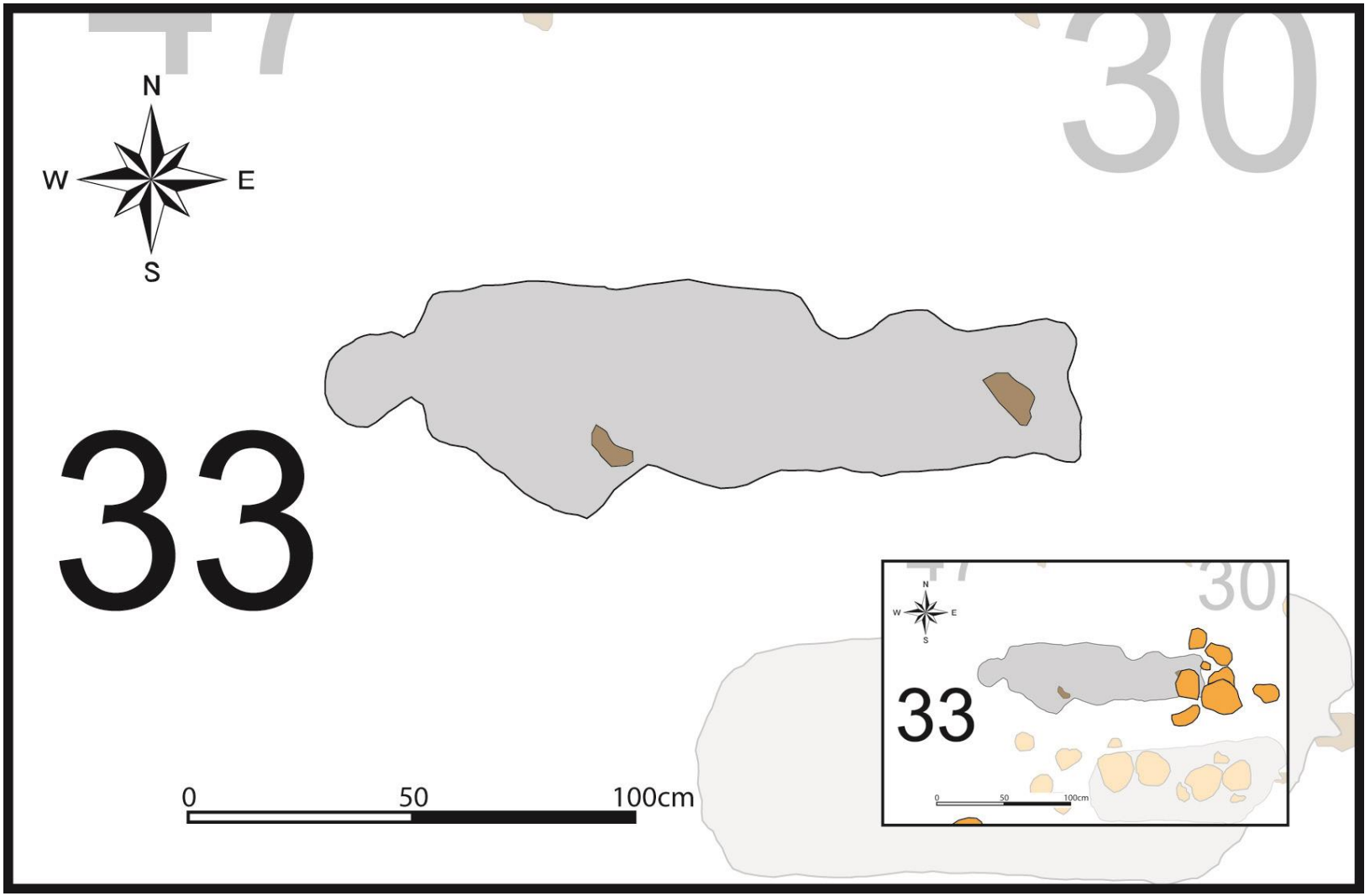

Plate A-34. Burial 33, single person burial: represented by an organic outline, aligned W-E (head to feet). Organic stain suggests extended burial position, no skeletal remains recovered, artefacts include wood and baleen fragments (unmapped). Inset depicts grave marker rocks.

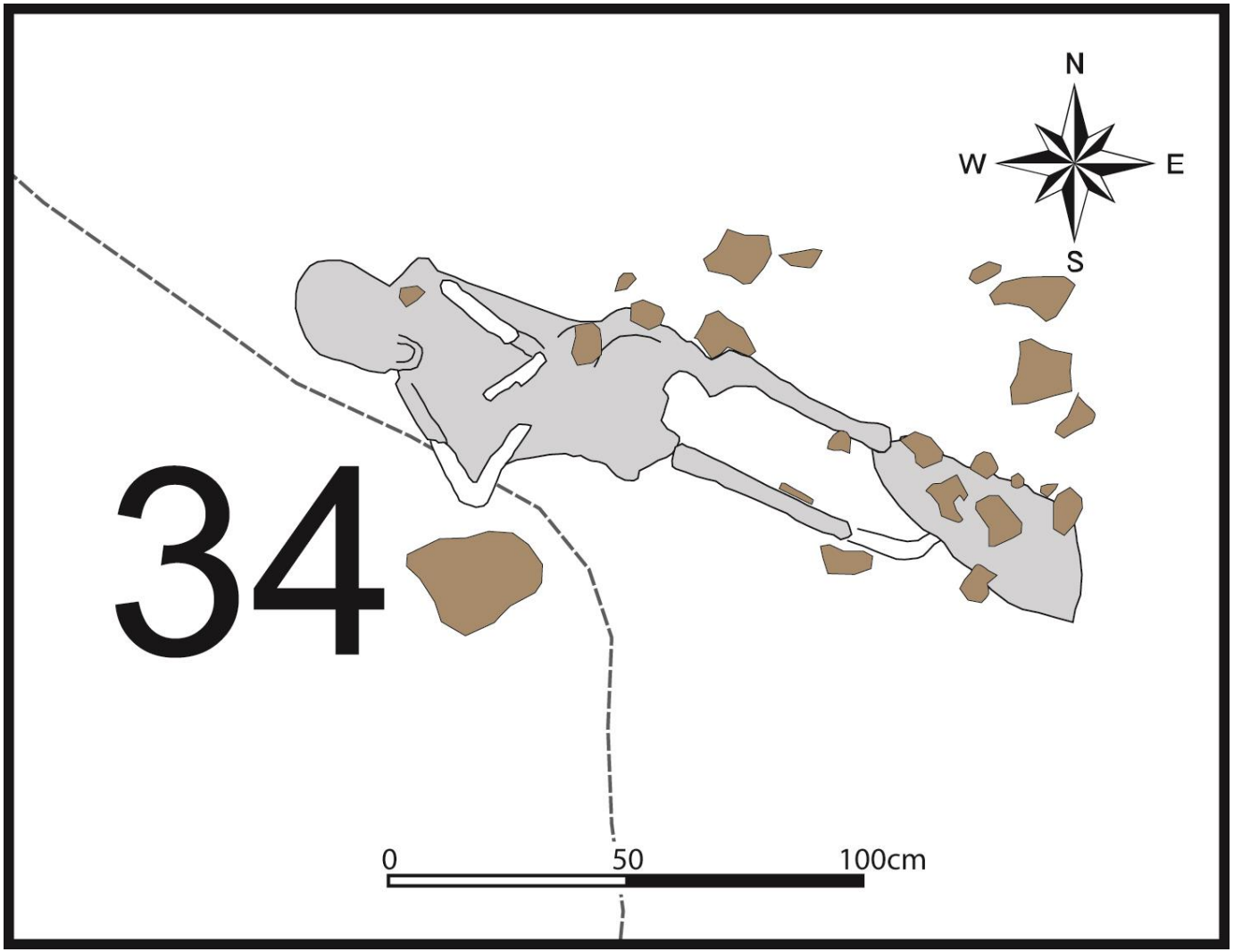

Plate A-35. Burial 34, single person burial: extended burial on back, torso slightly tilted to right, knees mixed (right semi-flexed and collapsed right, left extended), hands on chest, aligned WNW-ESE (head to knees).

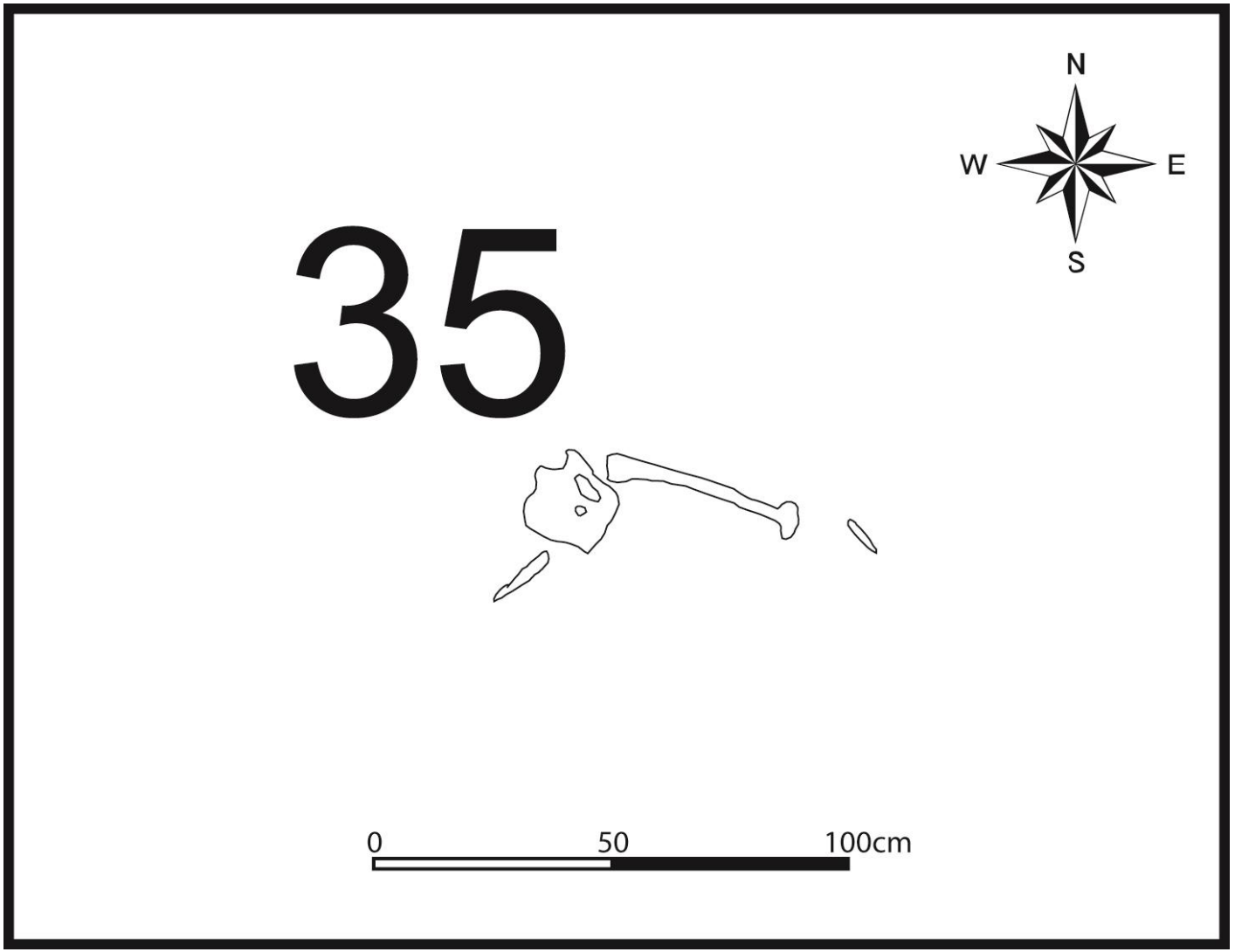

Plate A-36. Burial 35, single person burial: disturbed and fragmentary burial, suggested alignment of WNW-ESE (femur).

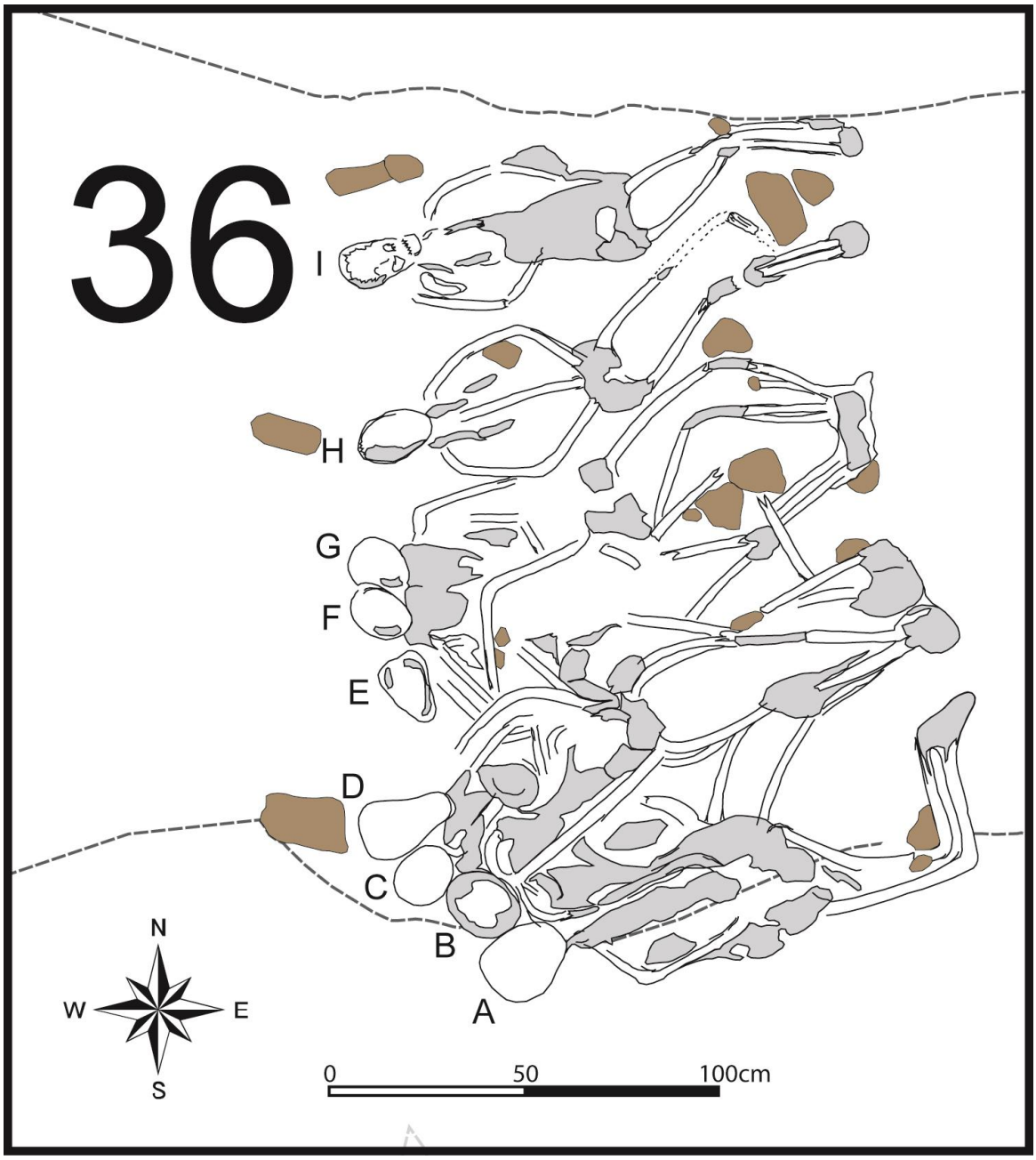
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Plate A-37. Burial 36, nine person burial: (A) semi-flexed burial on right side, knees collapsed right, feet together, hands on pelvis, aligned WSW-ENE (head to sacrum) and feet oriented NE; (B) semi-flexed burial on probable left side, knees collapsed left, aligned WSW-ENE (head to sacrum) and feet oriented NE; (C) poorly preserved remains, possibly aligned SW-NE (head to sacrum?); (D) poorly preserved remains overlapping with 36C, possibly extended with feet together, possibly aligned WSW-ENE (head to sacrum?); (E) poorly preserved remains, overlapping with 36F, possible hands on chest, head haphazard, possibly aligned WSW-ENE (head to sacrum?); (F) poorly preserved remains, overlapping with 36E, possible hands on chest, possibly aligned W-E (head to sacrum?); (G) semi-flexed burial on back, knees collapsed left, feet together, aligned WSW-ENE (head to feet); (H) semi-flexed burial on back, knees collapsed left, ankles cross right over left; hands on pelvis, aligned WSW-ENE (head to sacrum); (I) semi-flexed burial on back, knees collapsed left, feet together, hands on pelvis, head straightforward, aligned W-E (head to sacrum) and feet oriented ENE. Comingled remains of overlapping individuals B-G make it difficult to determine positions and alignment with certainty.

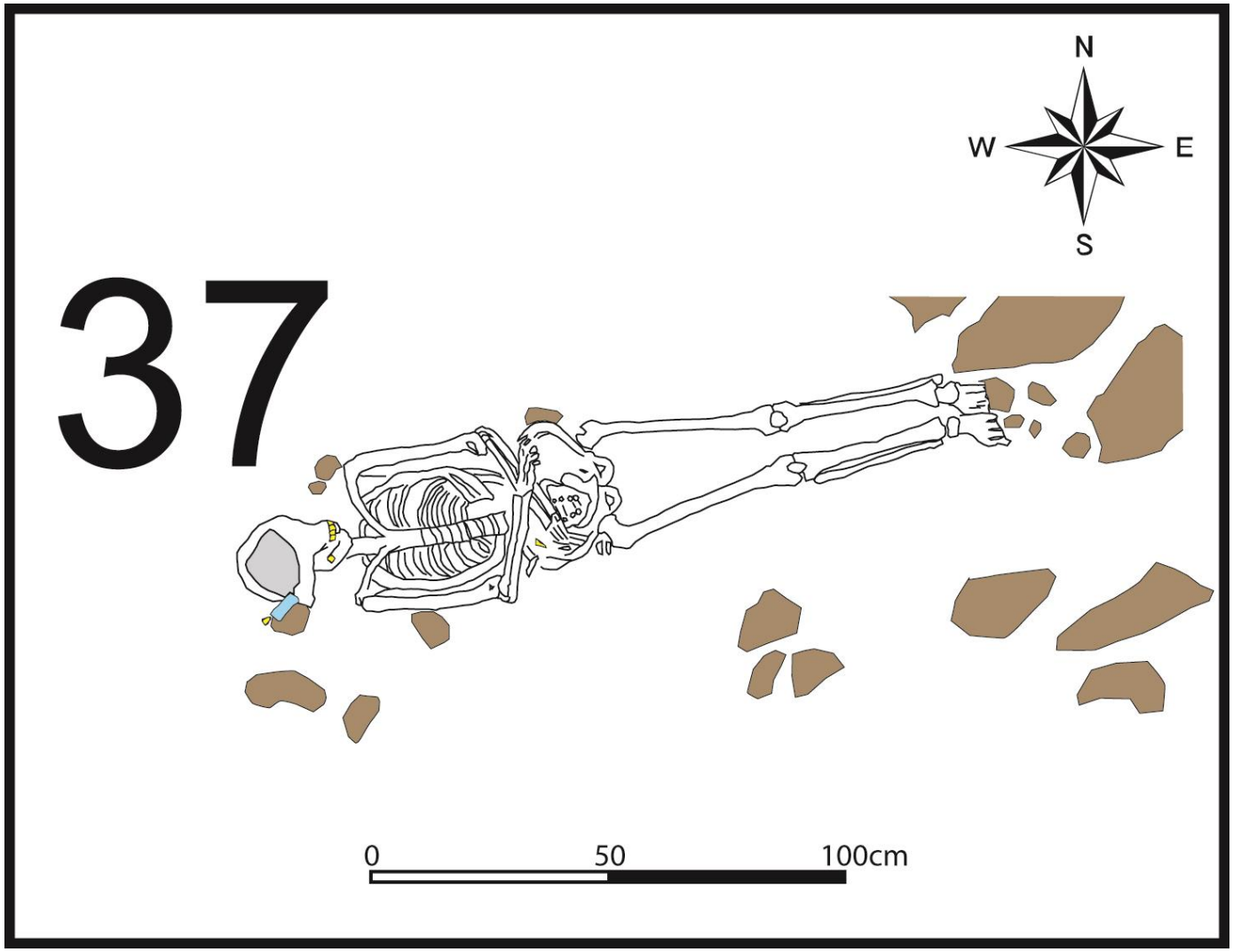

Plate A-38. Burial 37, single person burial: extended burial on back, wrists cross right over left with hands on pelvis, feet together, head rotated left, aligned WSW-ENE (head to feet), iron fragment along right side of skull.

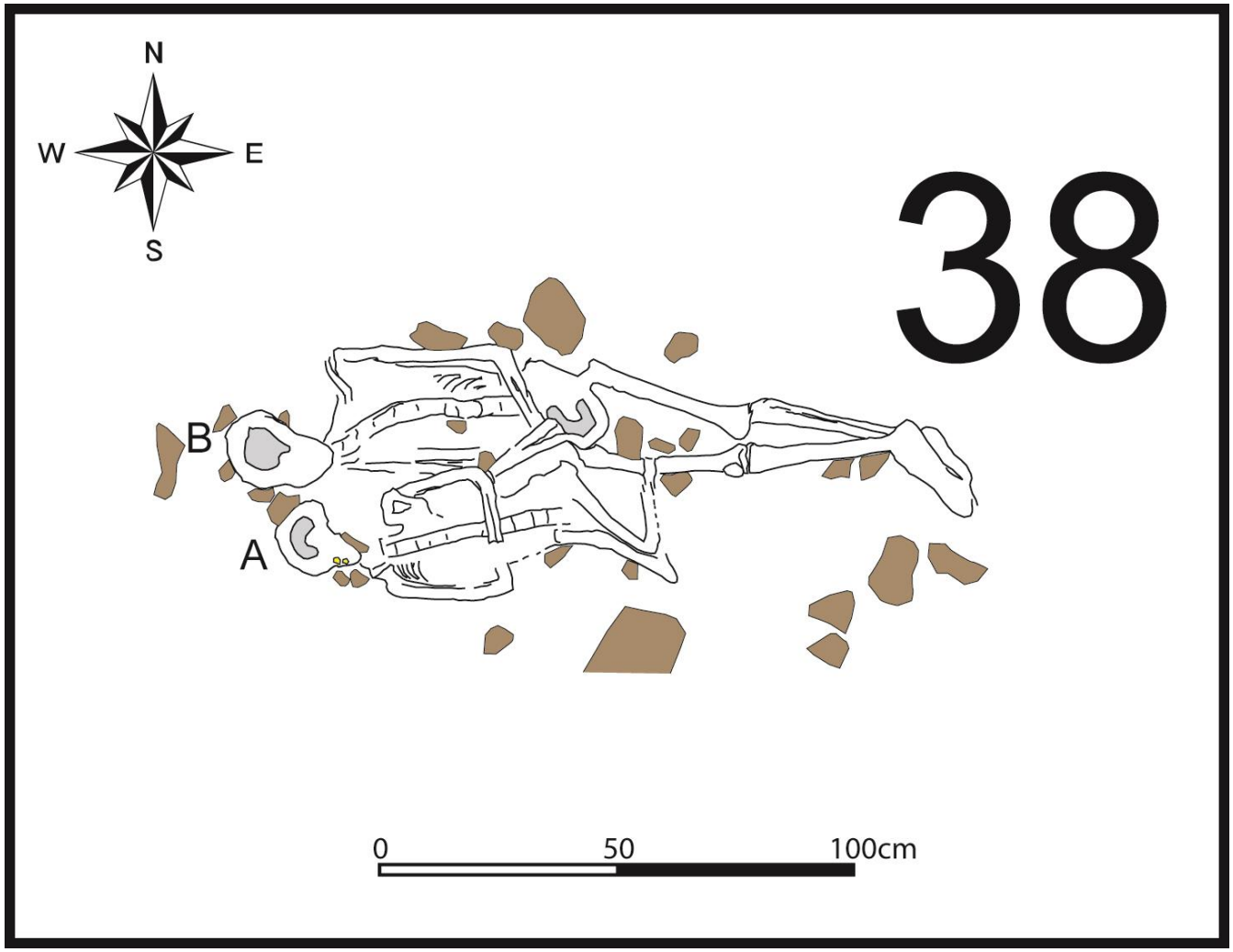

Plate A-39. Burial 38, two person burial: (A) semi-flexed burial on back, knees flexed and collapsed right, feet together left over right, arms cross over chest, head rotated right, aligned W-E (head to sacrum) with feet oriented ENE; (B) extended burial on back, ankles crossed right over left, wrists cross right over left with hands on pelvis, aligned W-E (head to sacrum). Individuals tilted slightly to right sides in order to fit into grave.

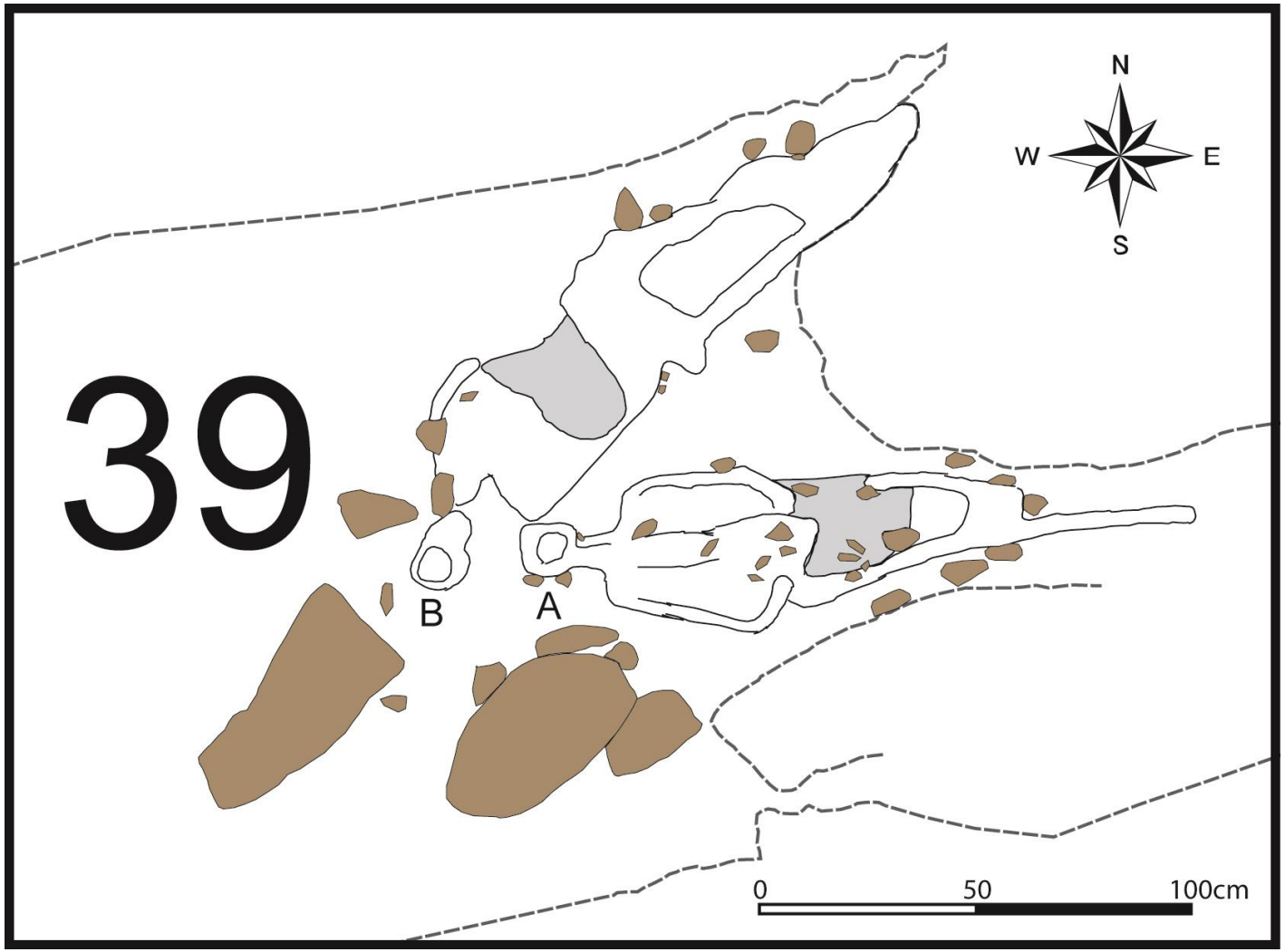

Plate A-40. Burial 39, two person burial: (A) extended burial on back, hands on pelvis, aligned W-E (head to feet); (B) extended burial on back, feet together, aligned SW-NE (head to feet). Underlying and adjacent bedrock outcrops account for the 45° difference in alignment between A and B.

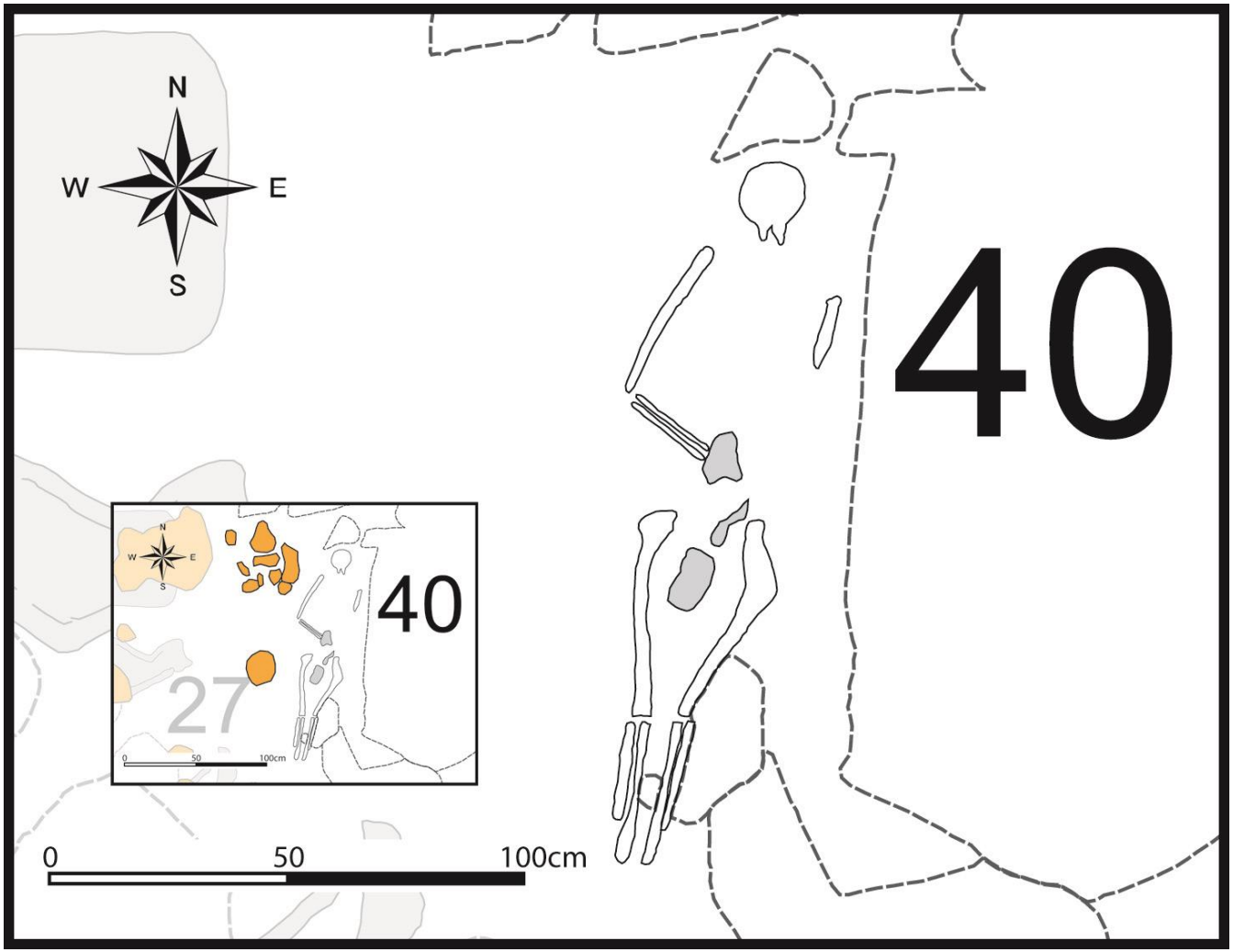

Plate A-41. Burial 40, single person burial: extended burial on back, feet together, hands on pelvis, aligned NNE-SSW (head to feet), artefacts include Basque nails and ceramic fragments (unmapped). Burial wedged into bedrock outcrop. Inset depicts grave marker rocks positioned east of skeletal remains; maps do not indicate any recording errors.

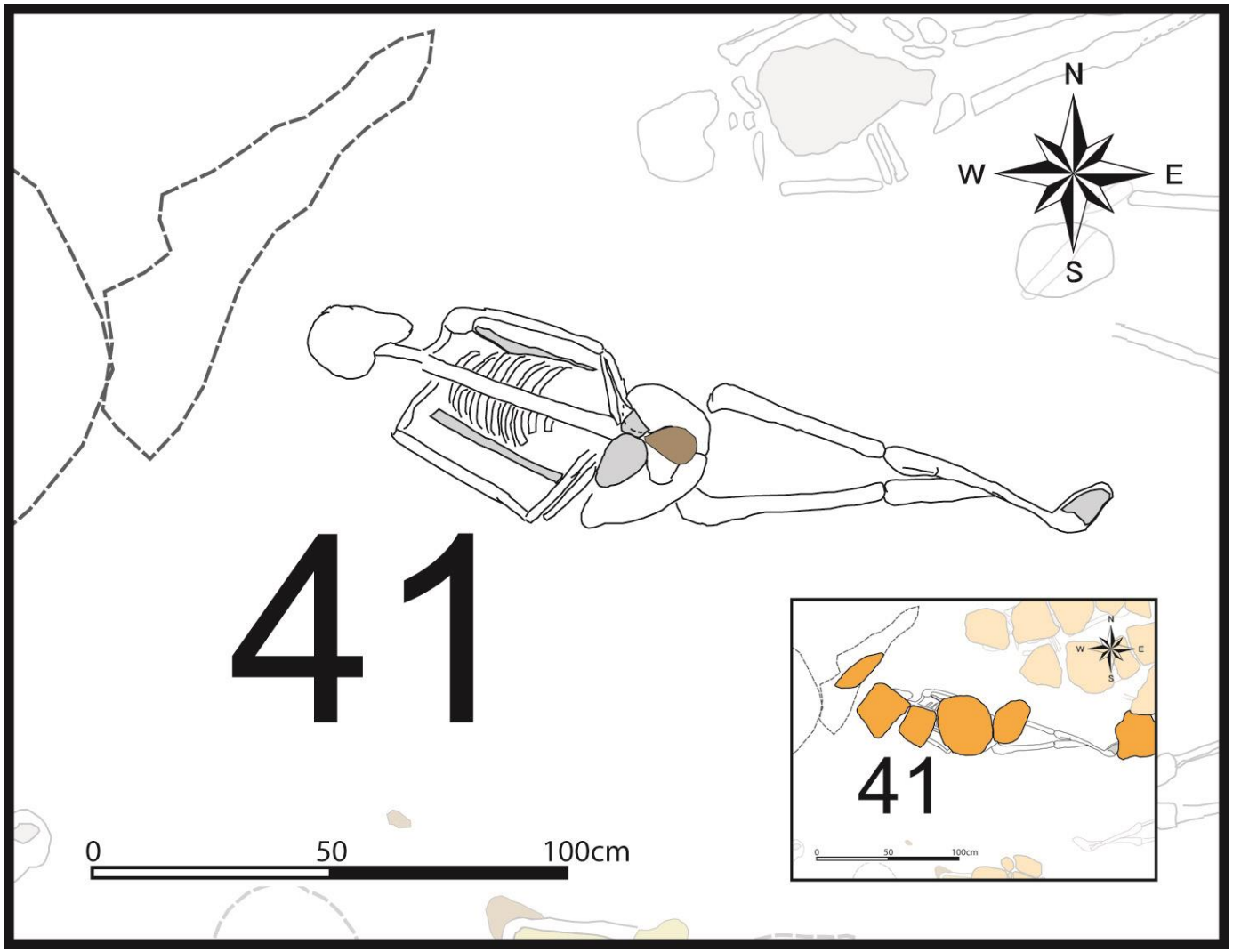

Plate A-42. Burial 41, single person burial: extended burial on back, legs crossed left over right, hands on pelvis, head rotated left, aligned WNW-ESE (head to sacrum) with feet oriented east, artefacts include ceramic and charcoal fragments (unmapped). Inset depicts grave marker rocks.

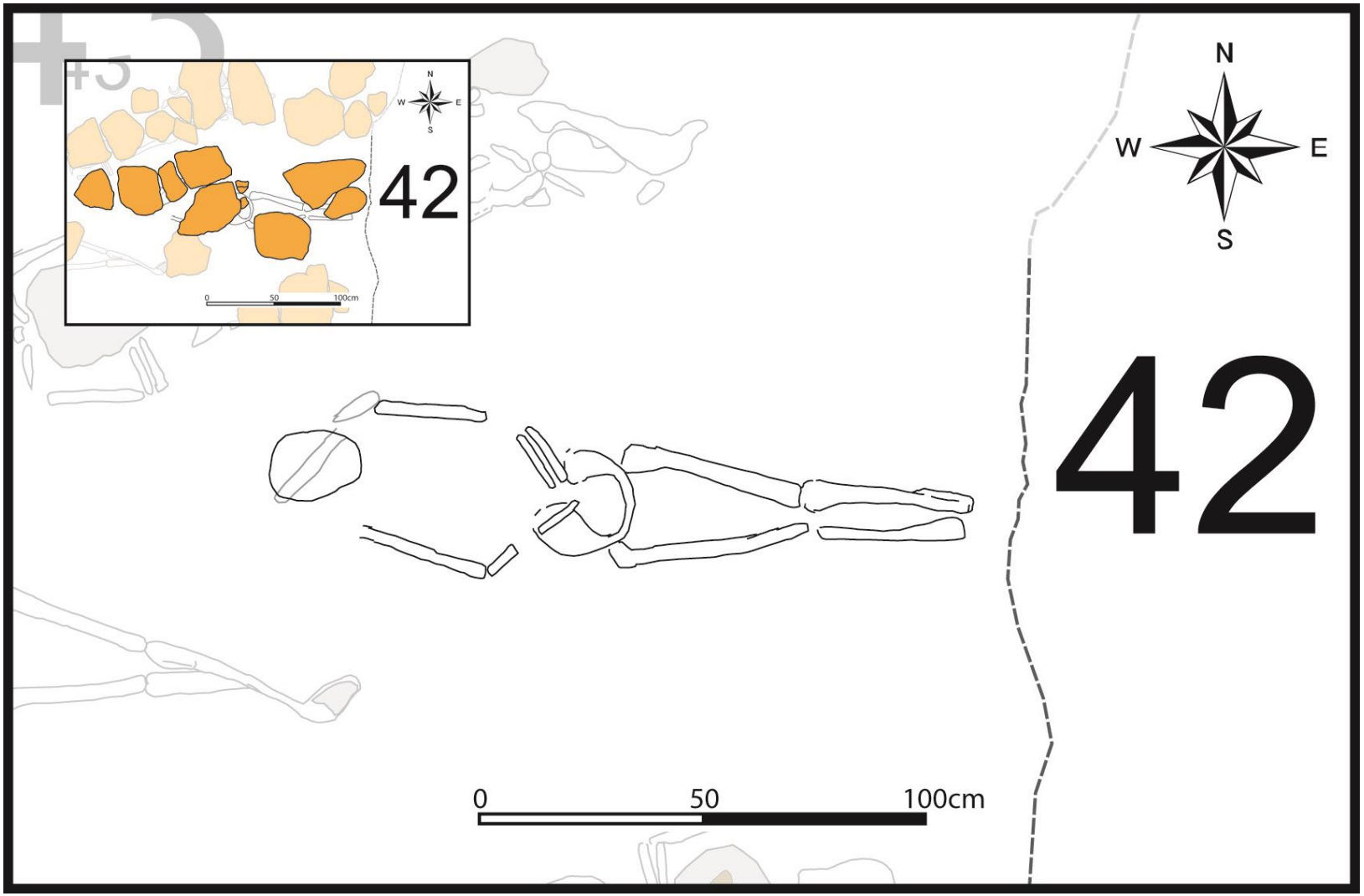

Plate A-43. Burial 42, single person burial: extended burial on back, feet together, hands on pelvis, aligned W-E (head to feet). Additional long bone located over skull and left shoulder (possibly belonging to individual 43B). Inset depicts grave marker rocks.

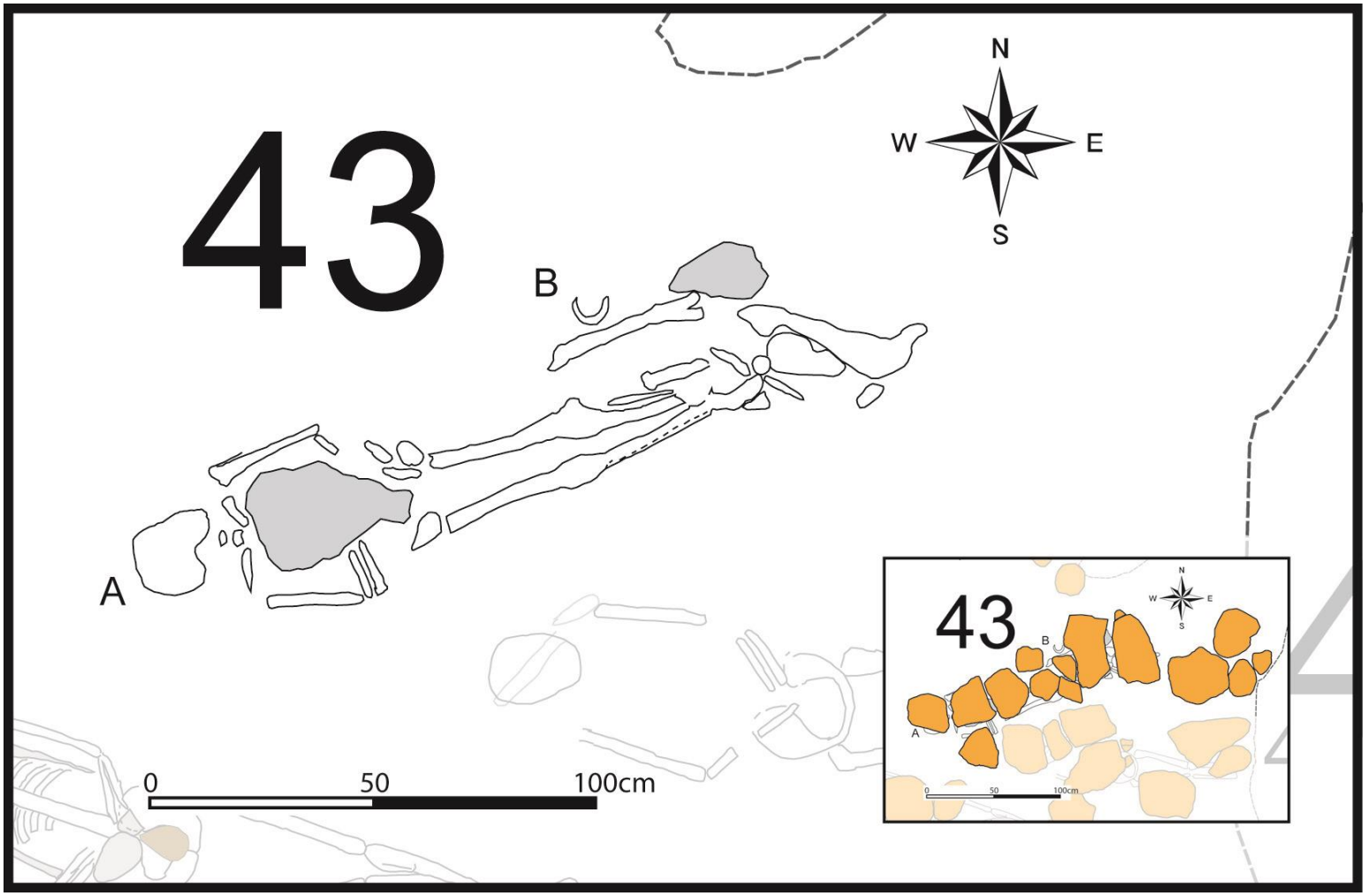

Plate A-44. Burial 43, two person burial: (A) extended burial on back, ankles crossed right over left, hands mixed (right on waist, left on pelvis), head rotated left, aligned WSW-ENE (head to feet); (B) possible disturbed burial, disarticulated, possible femur aligned W-E. Burial 43 possibly represents two single burials where 43A intruded on and disturbed an existing burial, 43B. Inset depicts grave marker rocks. Grave marker stones could be interpreted to continue east of 43B's disarticulated remains.

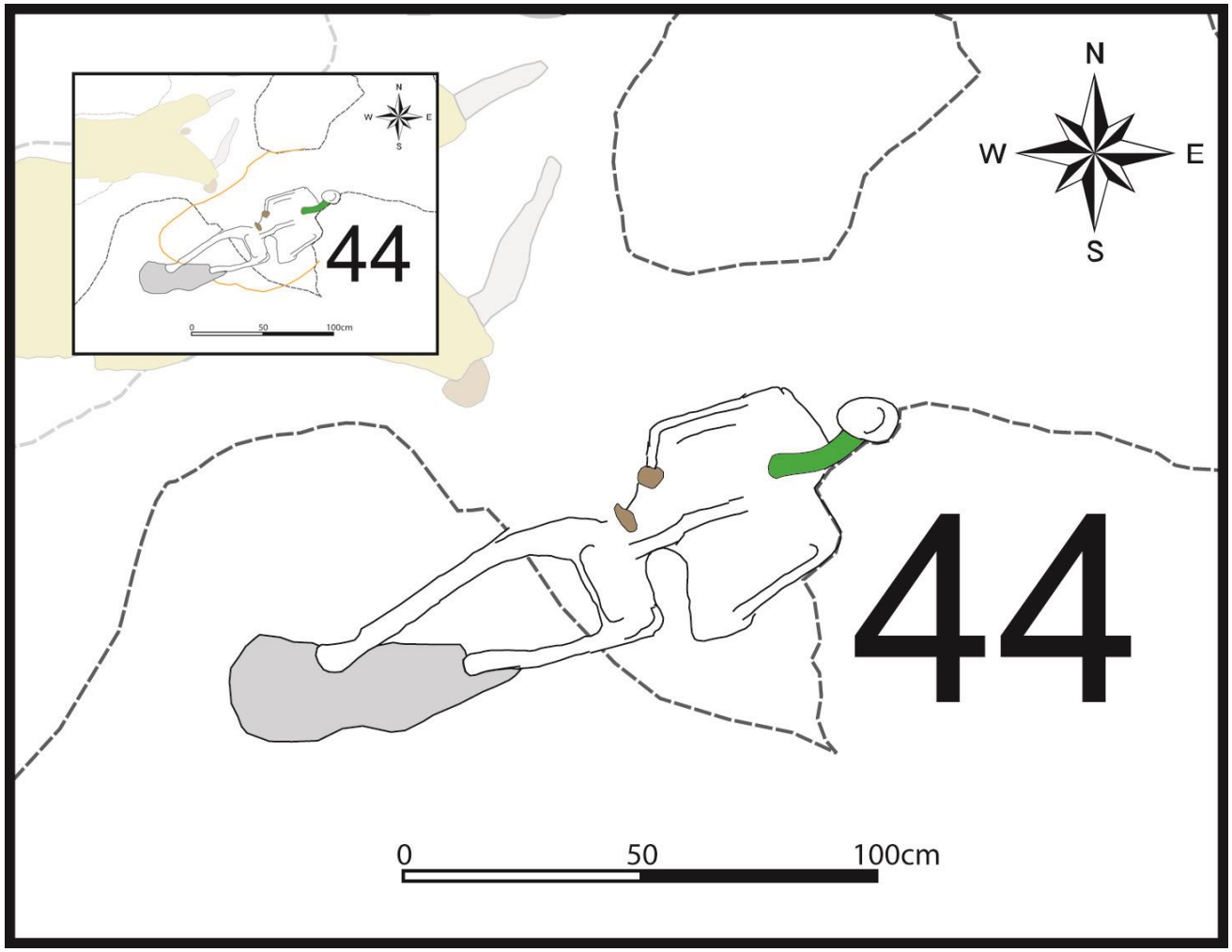

Plate A-45. Burial 44, single person burial: extended burial on back, hands on waist, aligned ENE-WSW (head to feet). Wood located over neck and upper chest. Additional artefacts mentioned in notes but not mapped include roof tile and iron nail fragments, and fire cracked rock found in layers above the grave fill; located within the grave fill were two nails, coarse earthenware fragments, grey ballast flint, wood chips, and charcoal fragments. Lower left leg noted as missing but no indication if this is was due to a preservation problem. Inset depicts partial grave pit outline observed above bone level.

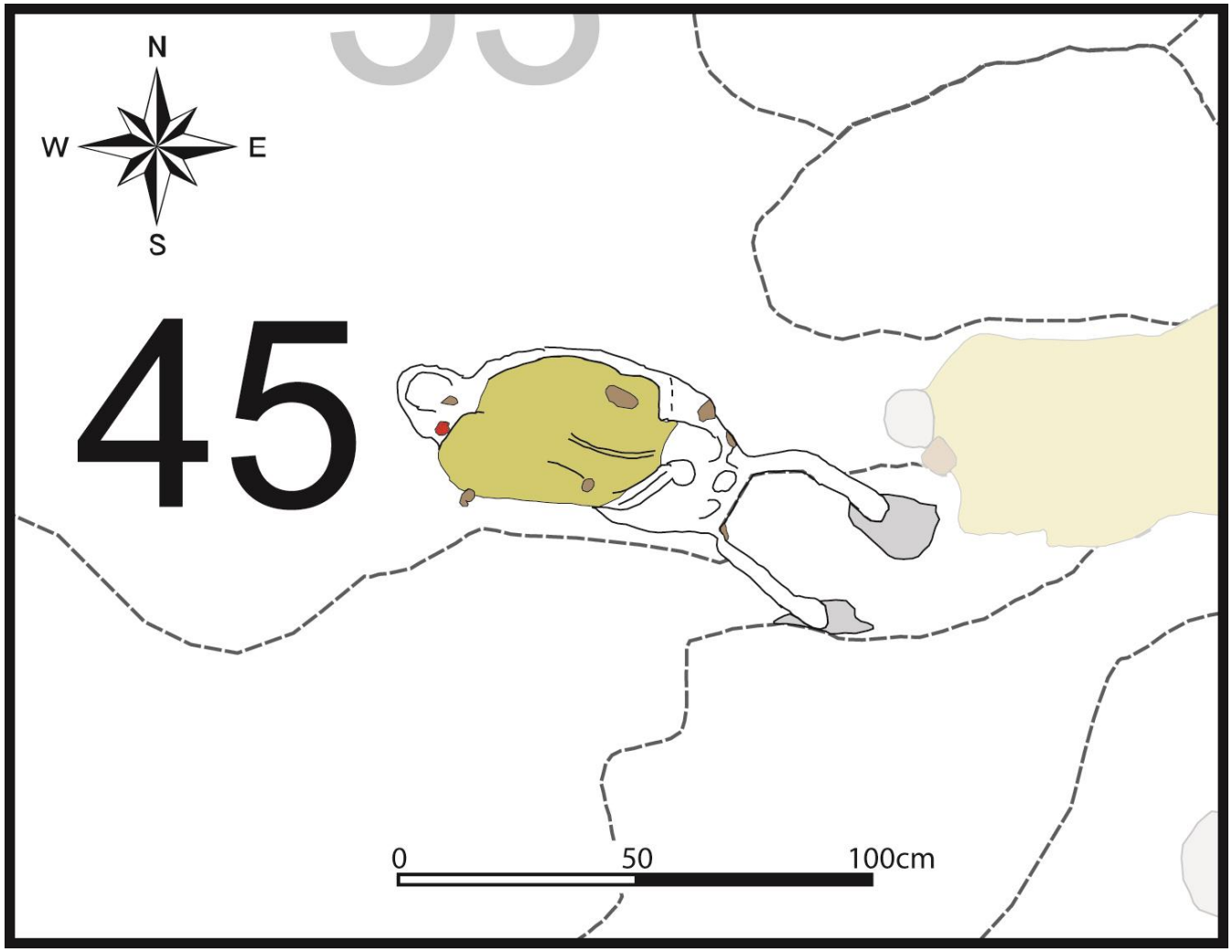

Plate A-46. Burial 45, single person burial: extended burial on back, knees apart (femora parallel), lower legs not preserved, hands on pelvis, aligned WNW-ESE (head to knees), textile located on torso and upper limbs, roof tile fragment on right neck/shoulder. Preservation tends to be poor in burials resting directly on bedrock, may account for missing lower limbs here.

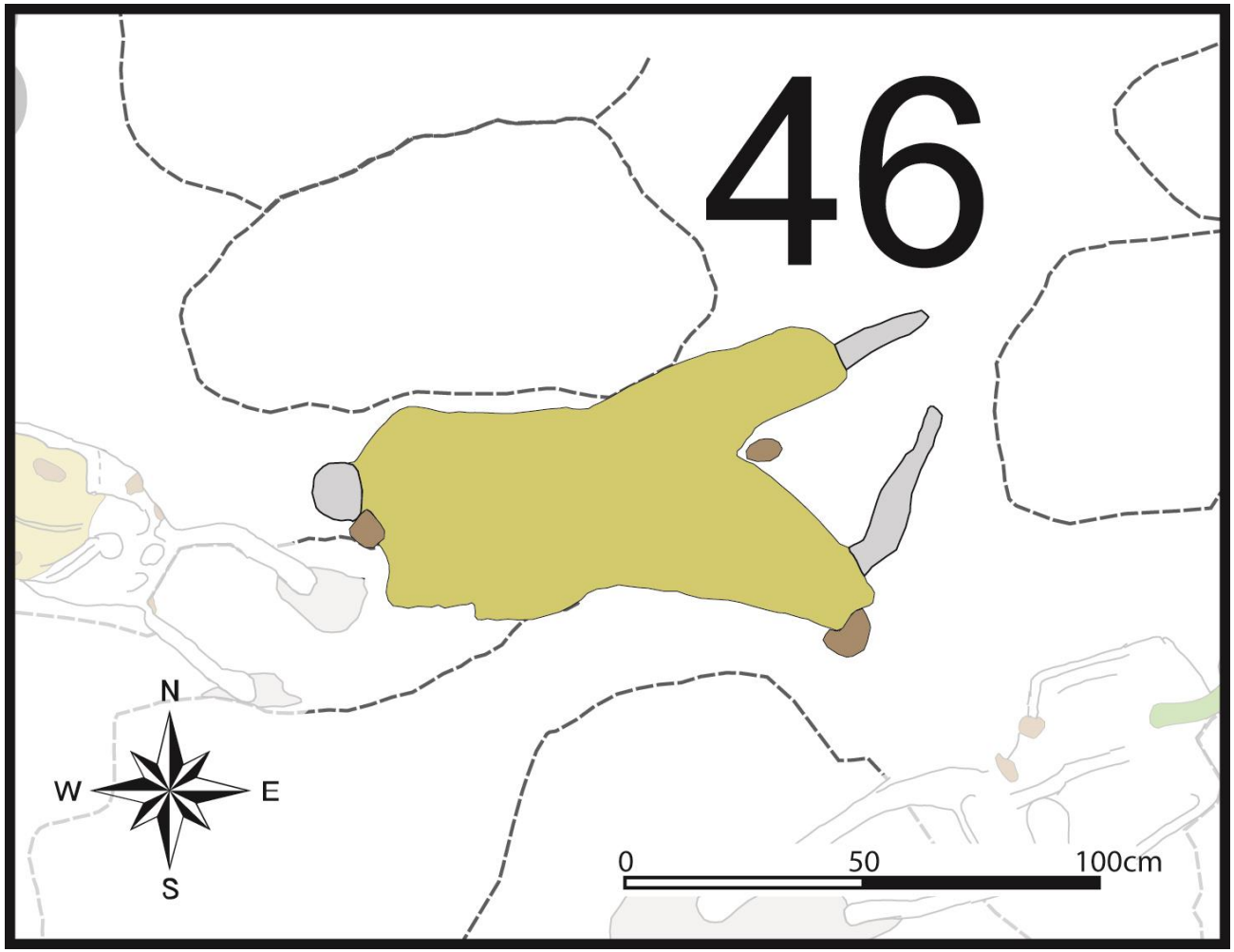

Plate A-47. Burial 46, single person burial: semi-flexed (or haphazard) burial on back, knees mixed (right semi-flexed and collapsed right, left extended laterally), feet apart, aligned W-E (head to sacrum) with feet oriented ENE, textile from neck to mid tibiae region (shirt and pants). Unmapped artefacts include a lead disc on left thigh under textile, iron nail, wood fragments, and baleen.

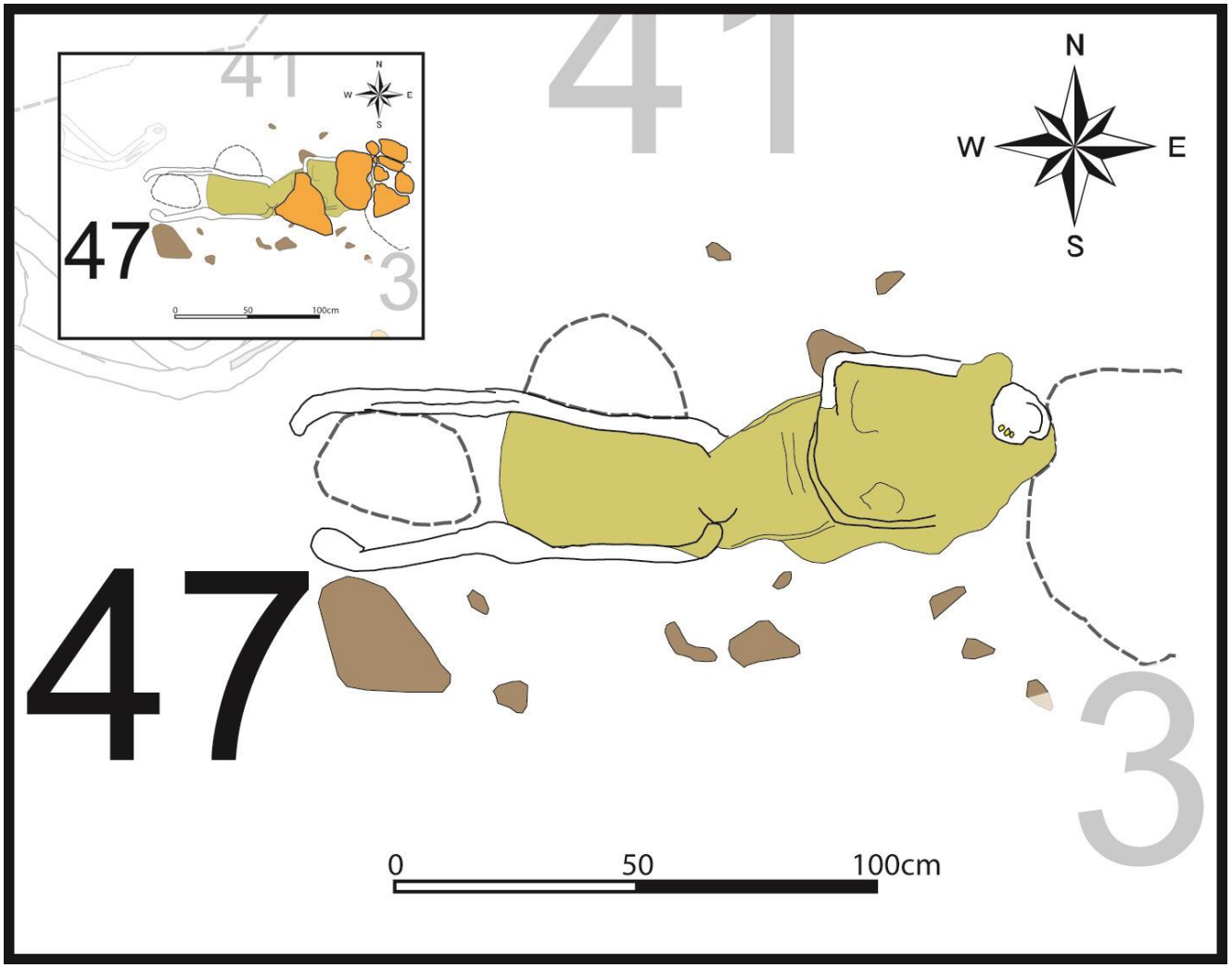

Plate A-48. Burial 47, single person burial: extended burial on back, feet apart, arms cross over waist with hands on waist/pelvis, aligned ENE-WSW (head to sacrum) with feet oriented west, textile shown from head to knees with possible belt, and unmapped wood chips. Inset depicts grave marker rocks.

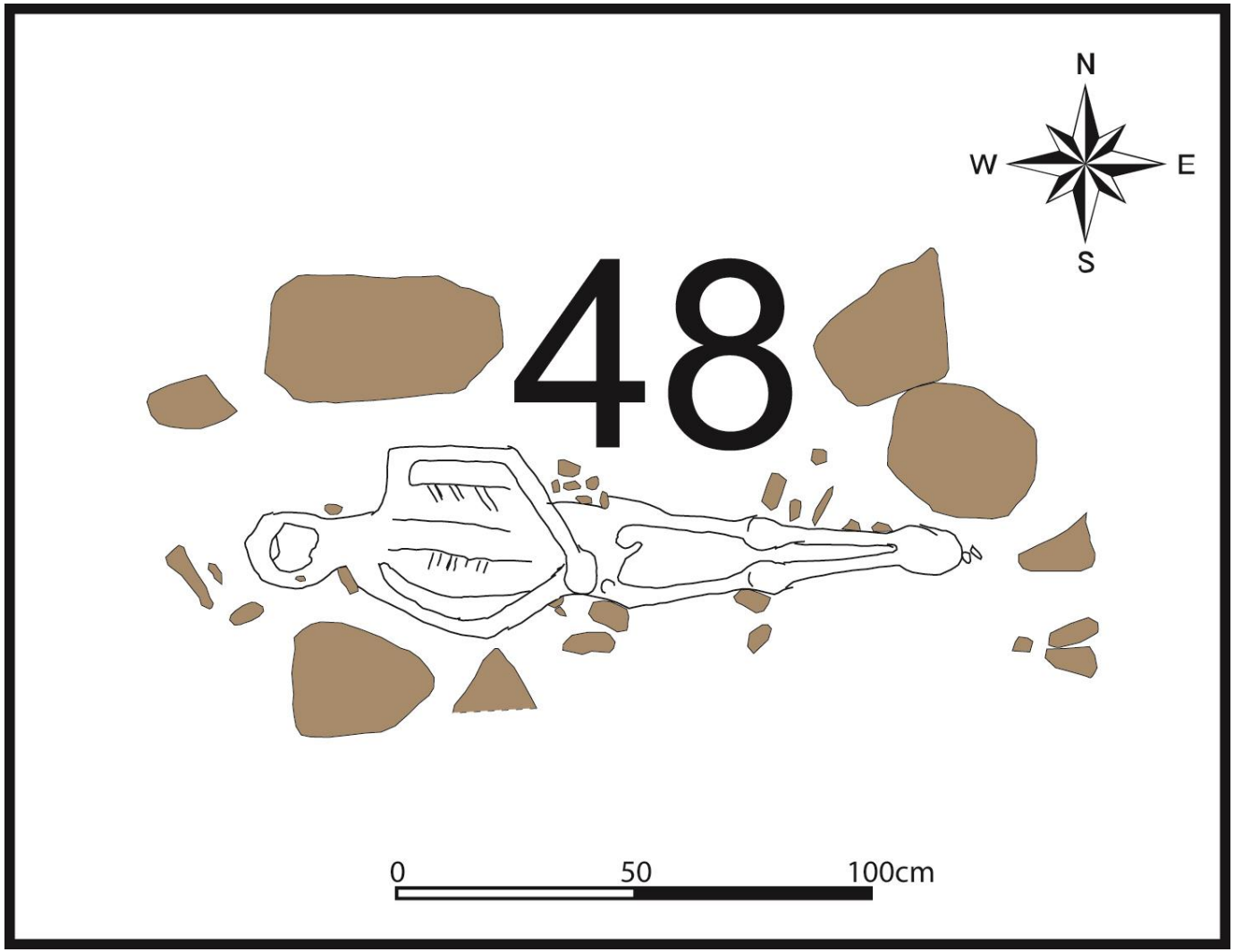

Plate A-49. Burial 48, single burial: extended burial on back, feet together, hands on pelvis left over right, aligned W-E (head to feet).

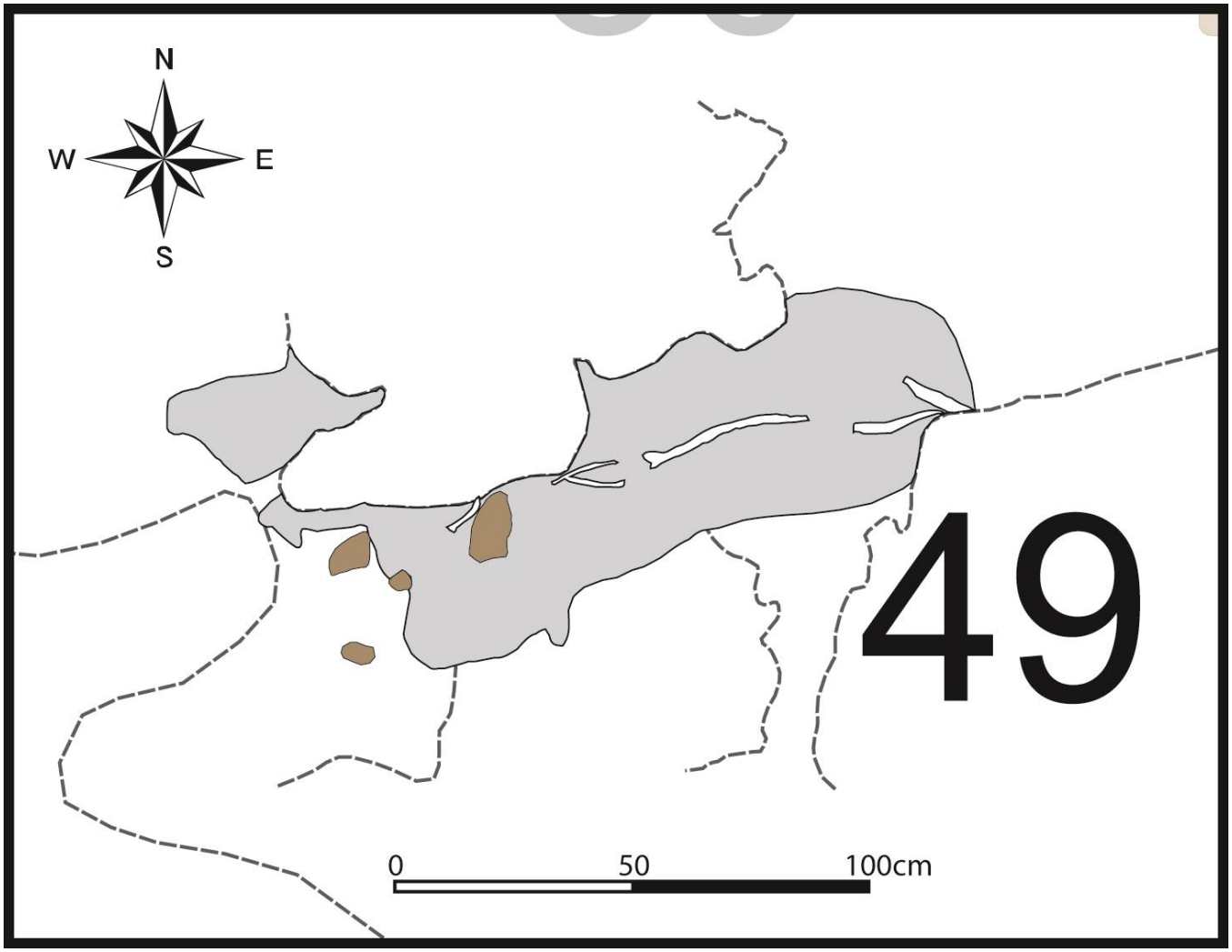

Plate A-50. Burial 49, single person burial: disarticulated elements tentatively identified as “ribs?” and “leg bones" in the field, organic stain suggests WSW-ENE alignment (organic stain with possible leg bones oriented ENE).

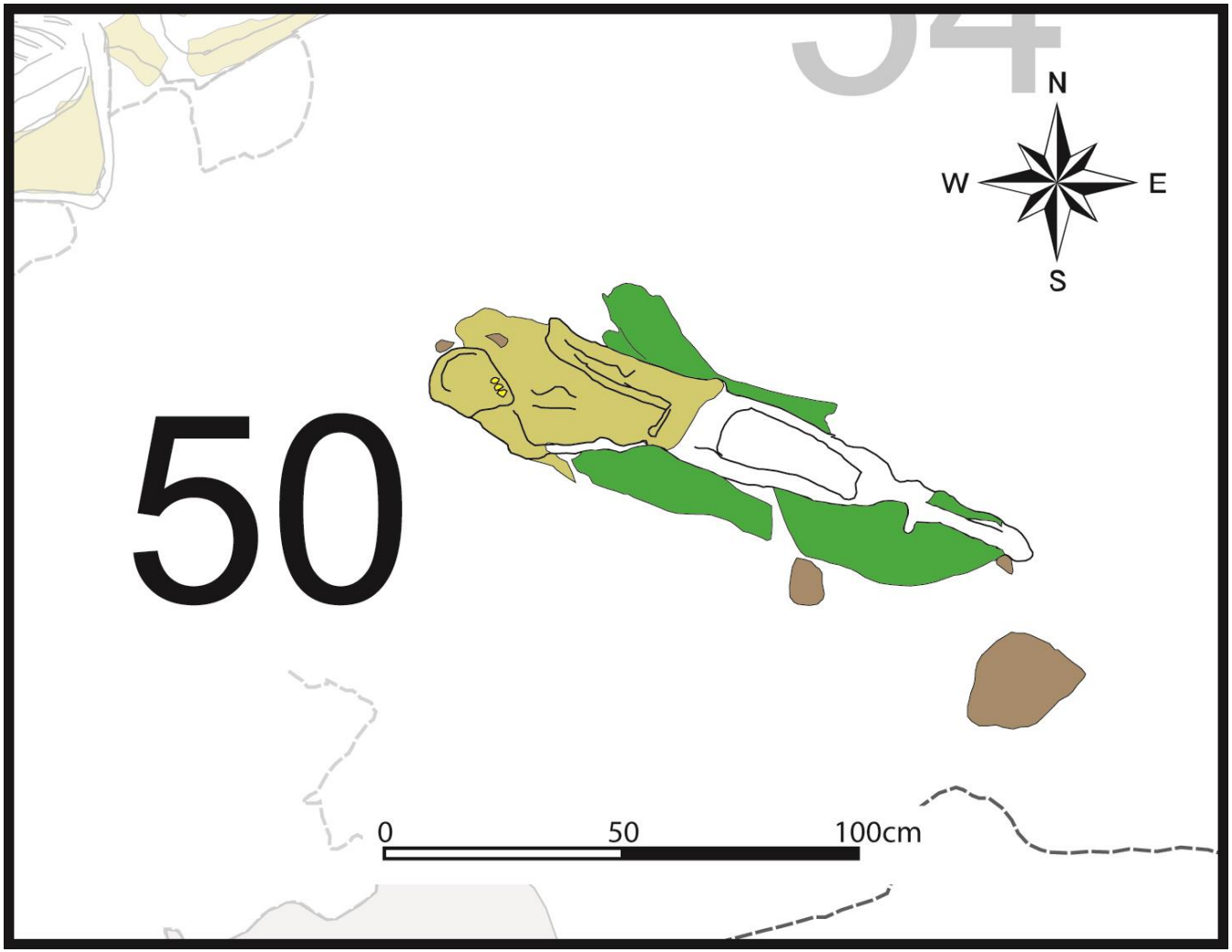

Plate A-51. Burial 50, single person burial: buried directly on barrel parts, extended burial, feet together, hands on waist/pelvis, head rotated right, aligned WNW-ESE (head to feet), textile over head to waist, barrel staves under torso to mid-thigh, and round barrel lid, or base, under legs and feet. Unmapped artefacts located in grave fill include baleen, seal bone, and wood chips.

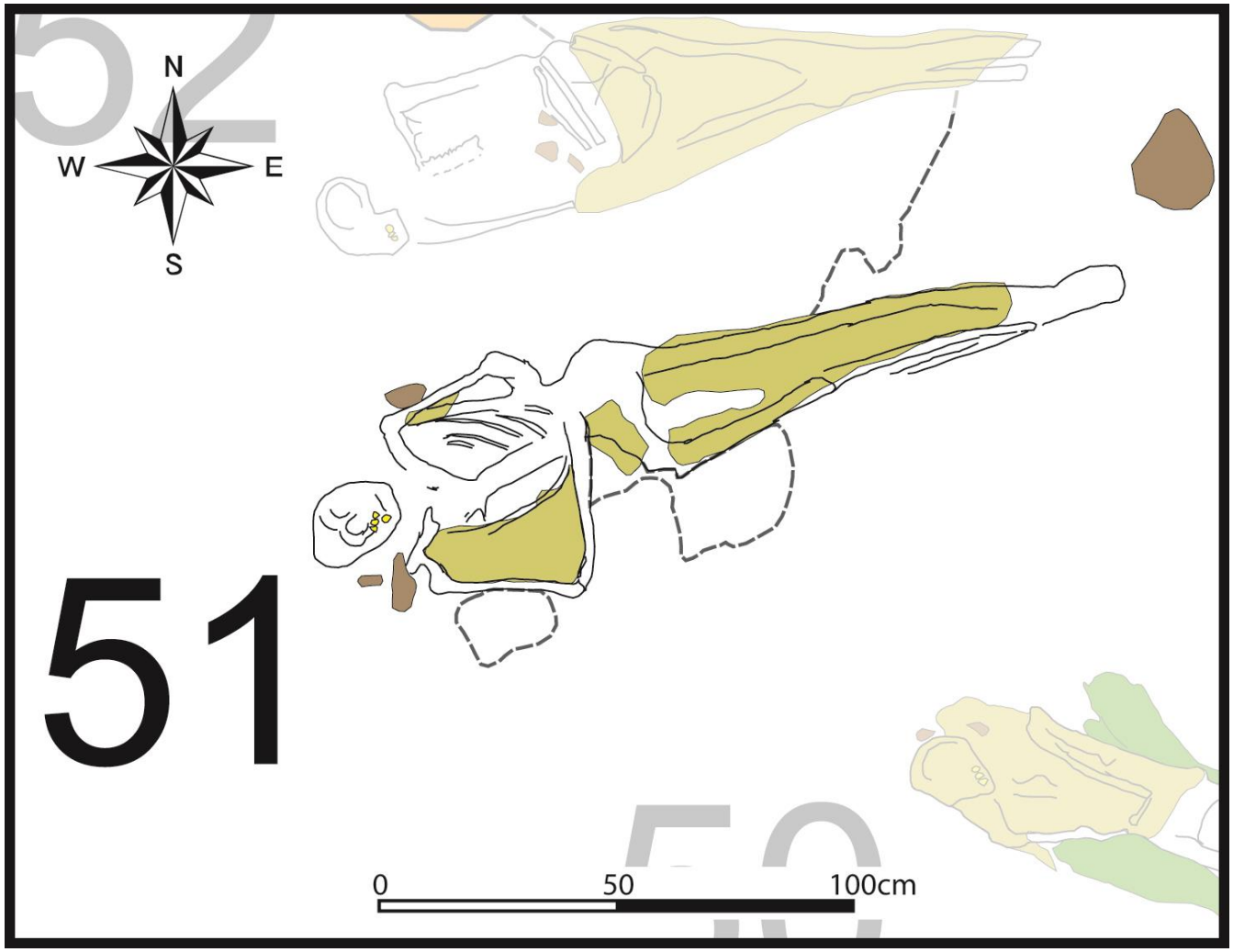

Plate A-52. Burial 51, single person burial: extended burial on back, feet together, arms cross with hands on pelvis/waist, aligned WSW-ENE (head to feet), textile located predominantly over right side of torso, pelvis, and both legs, unmapped artefacts include bark or possible leather fragments, and baleen fragments found in pelvic region.

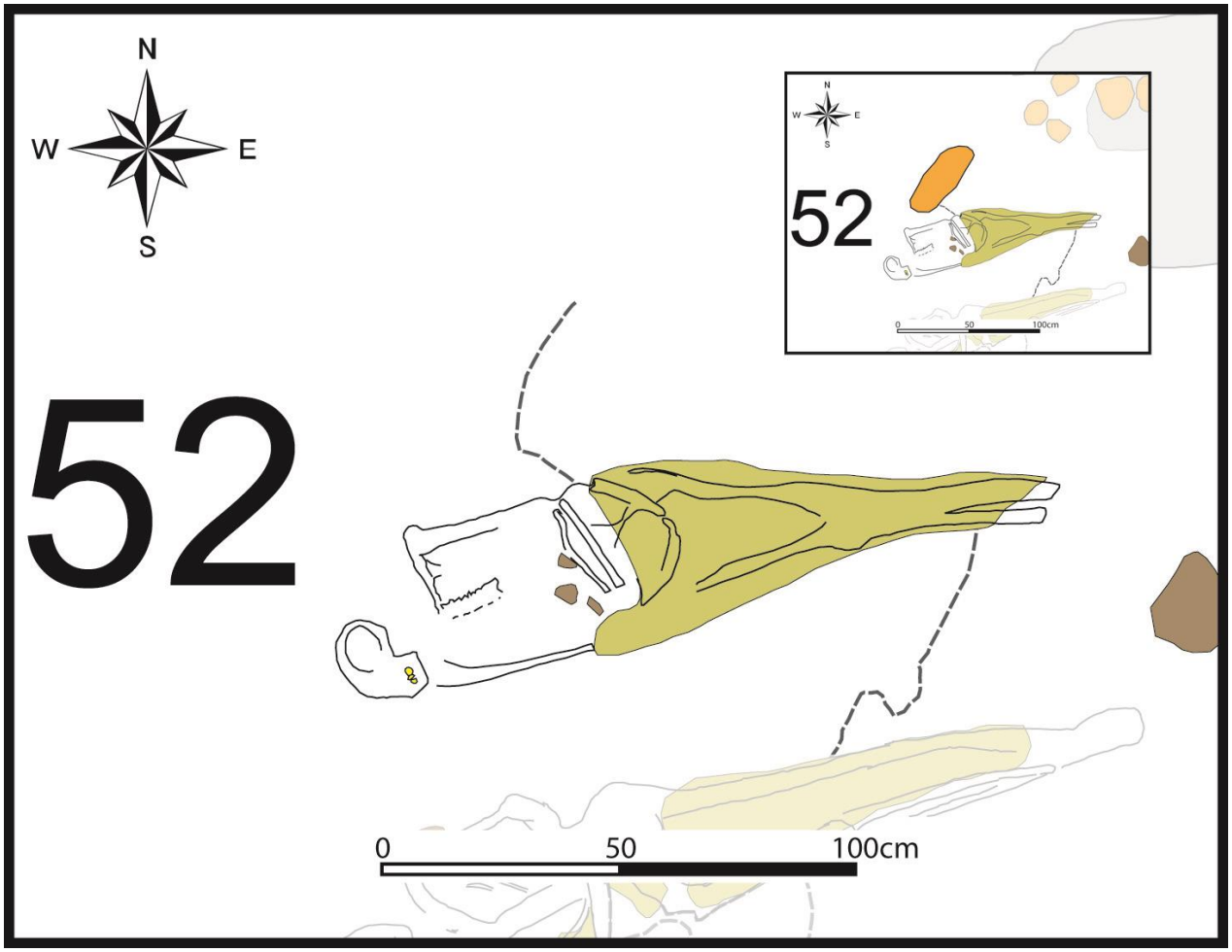

Plate A-53. Burial 52, single person burial: extended burial on back, feet together, hands mixed (right extended, left on right pelvis), head rotated right, aligned WSW-ENE (head to sacrum) and feet oriented east, textile from waist to ankles (suggests long pants), additional fragments on right shoulder and right arm. Unmapped artefacts include wood and nails; a possible wooden cross grave marker [vertically oriented wood located at 35 cm DBS, switching horizontally at 44 cm DBS with a second nail, combined with rocks these could possibly indicate a grave marker (cross) just west of skeleton (Jefferson 1985:6)]. Inset depicts grave marker rock just north of skeletal remains.

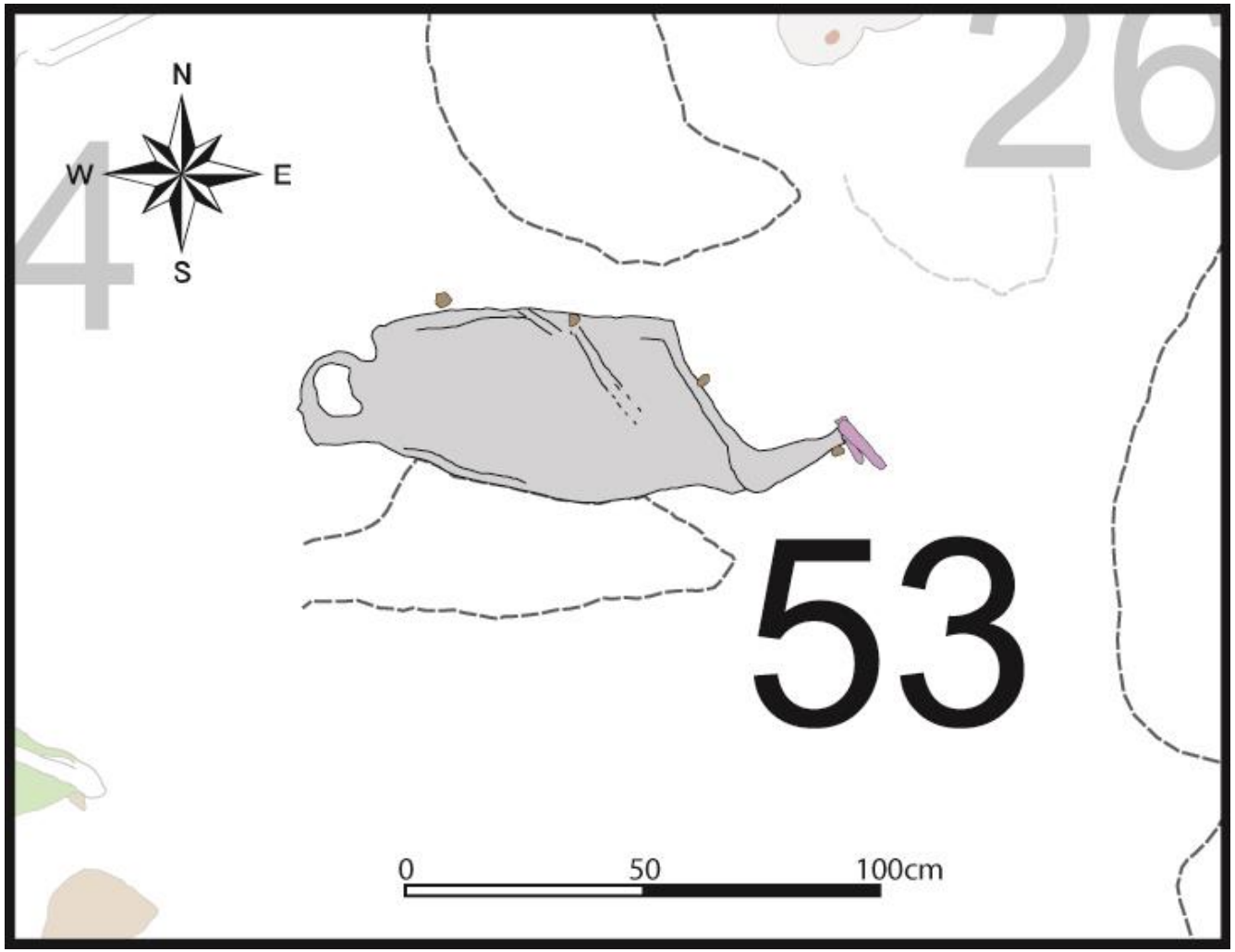

Plate A-54. Burial 53, single person burial: semi-flexed burial on back, knees collapsed right, hands cross on waist/pelvis, head rotated right, aligned W-E (head to feet). Baleen located over lower legs, and large piece of wood located on top of skull (wood mapped but map not located). Unmapped artefacts within grave fill include wood chips and bark fragments; artefacts located in soil above grave fill include a nail, iron fragment, and ceramic sherd.

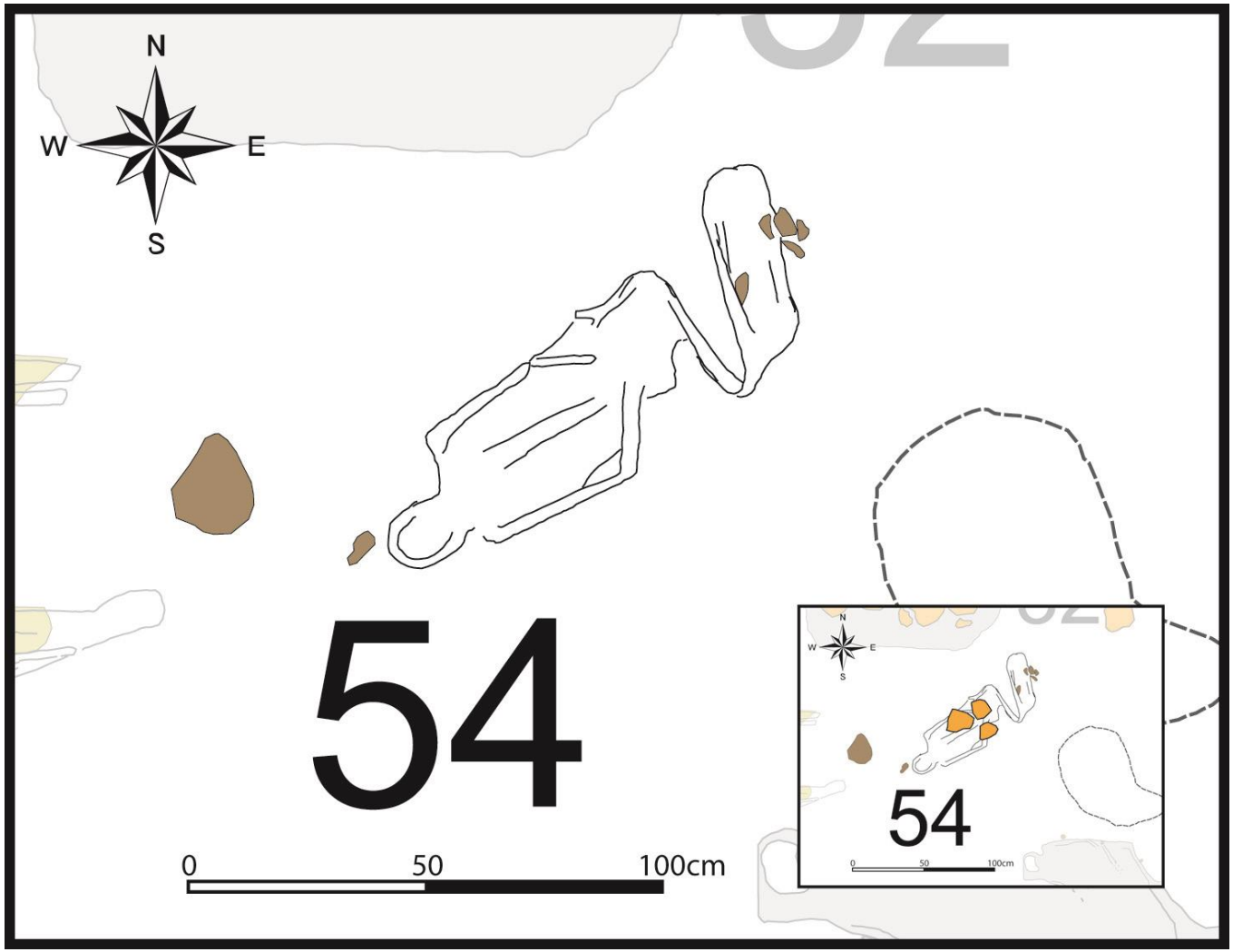

Plate A-55. Burial 54, single person burial: semi-flexed burial on back, knees flexed and collapsed right, feet together, hands over pelvis, aligned SW-NE (head to sacrum) and feet oriented NNE, unmapped wood chips found in sod above skeleton. Inset depicts grave marker rocks.

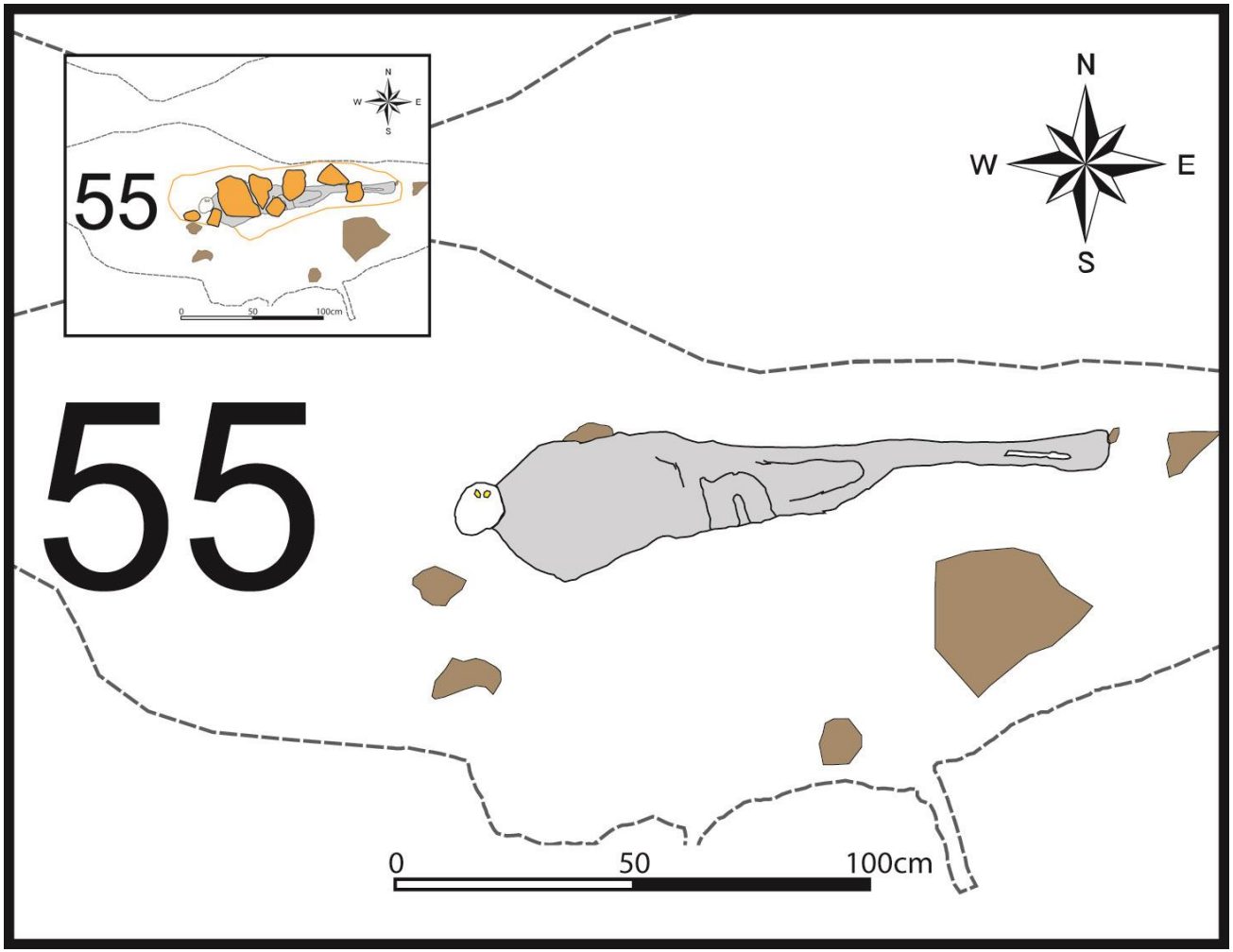

Plate A-56. Burial 55, single person burial: represented primarily by an organic stain, extended burial on back, knees mixed (right semi-flexed and collapsed left, left extended), feet together, hands probably on pelvis, aligned W-E (head to feet). Patch of hard black substance over right pelvis; unmapped artefacts include goldish-coloured material found between upper legs (textile?), and two pieces of earthenware with brown glaze found below sod. Inset depicts grave marker rocks and grave pit outline observed above bone level.

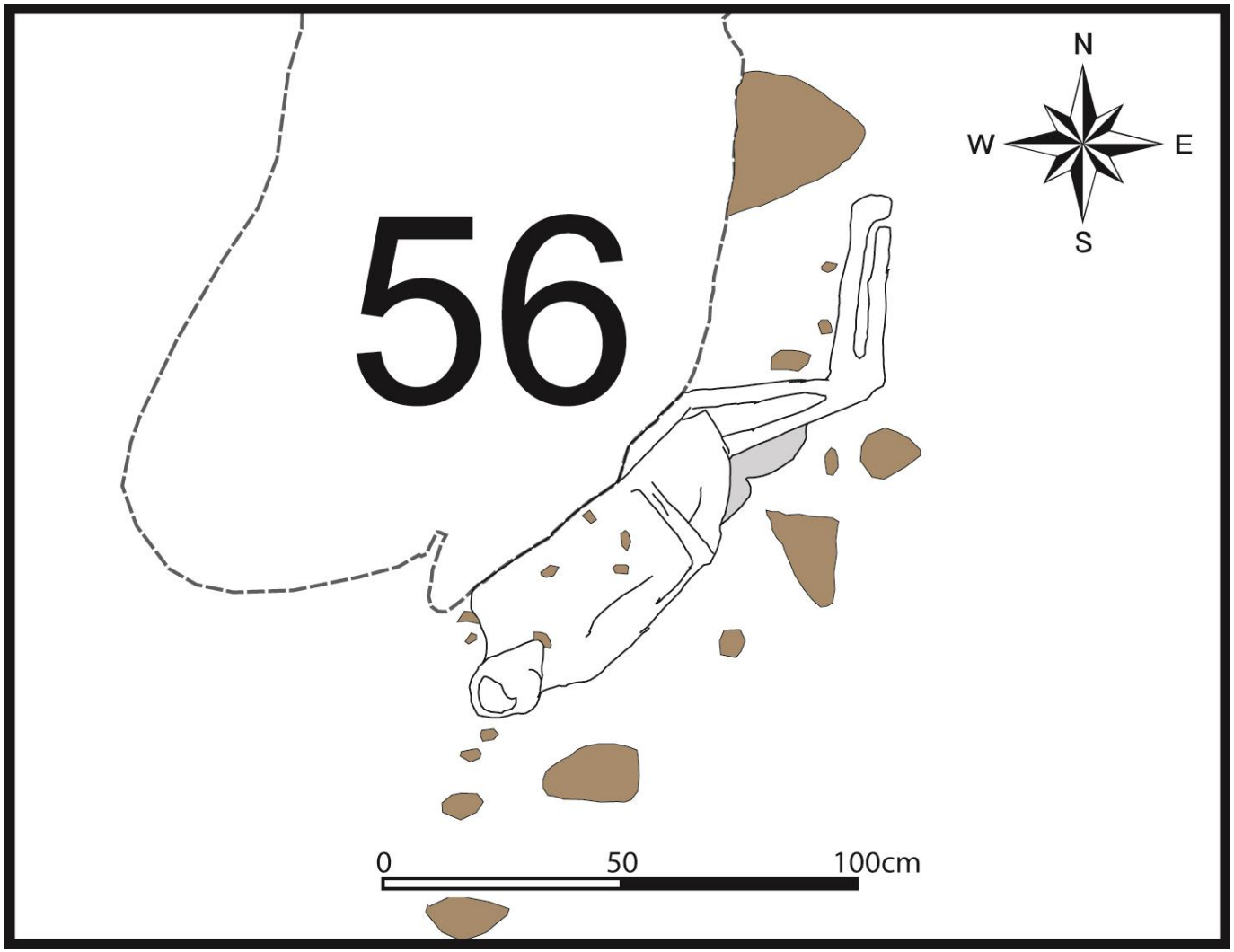

Plate A-57. Burial 56, single burial: semi-flexed burial on back (tilted to right side because torso resting on bedrock outcrop), knees collapsed right, feet together, right hand on left pelvis, aligned SW-NE (head to feet), unmapped nail, roof tile, and porcelain fragments located in buried sod above grave.

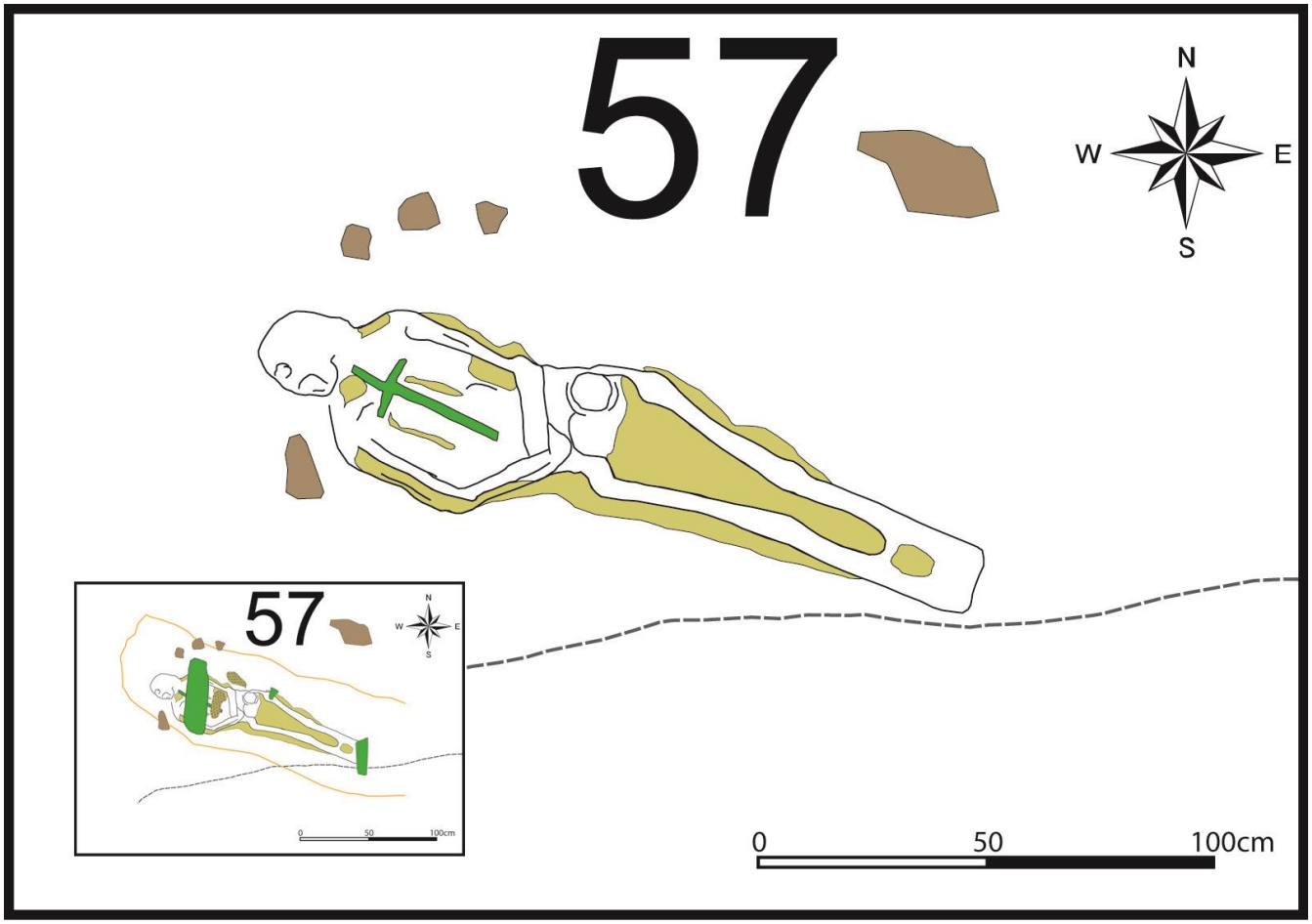

Plate A-58. Burial 57, single person burial: extended burial on back, feet together, wrists crossed right over left with hands on pelvis, head rotated right, aligned WNW-ESE (head to feet). Textile located beneath skeleton from neck to feet, and outside of arms and legs by a few cm, with (braided) textile cords running parallel down either side of chest (possible ties to a cloak or cape); a wooden cross placed directly on the chest is an intentional grave offering. Inset depicts additional artefacts located above skeletal remains and cross, including fragments of wood over left hip and feet, a larger wooden board positioned over wooden cross and chest, leather fragments over abdomen and outside of left elbow, as well as, the partial grave pit outline observed above bone level.

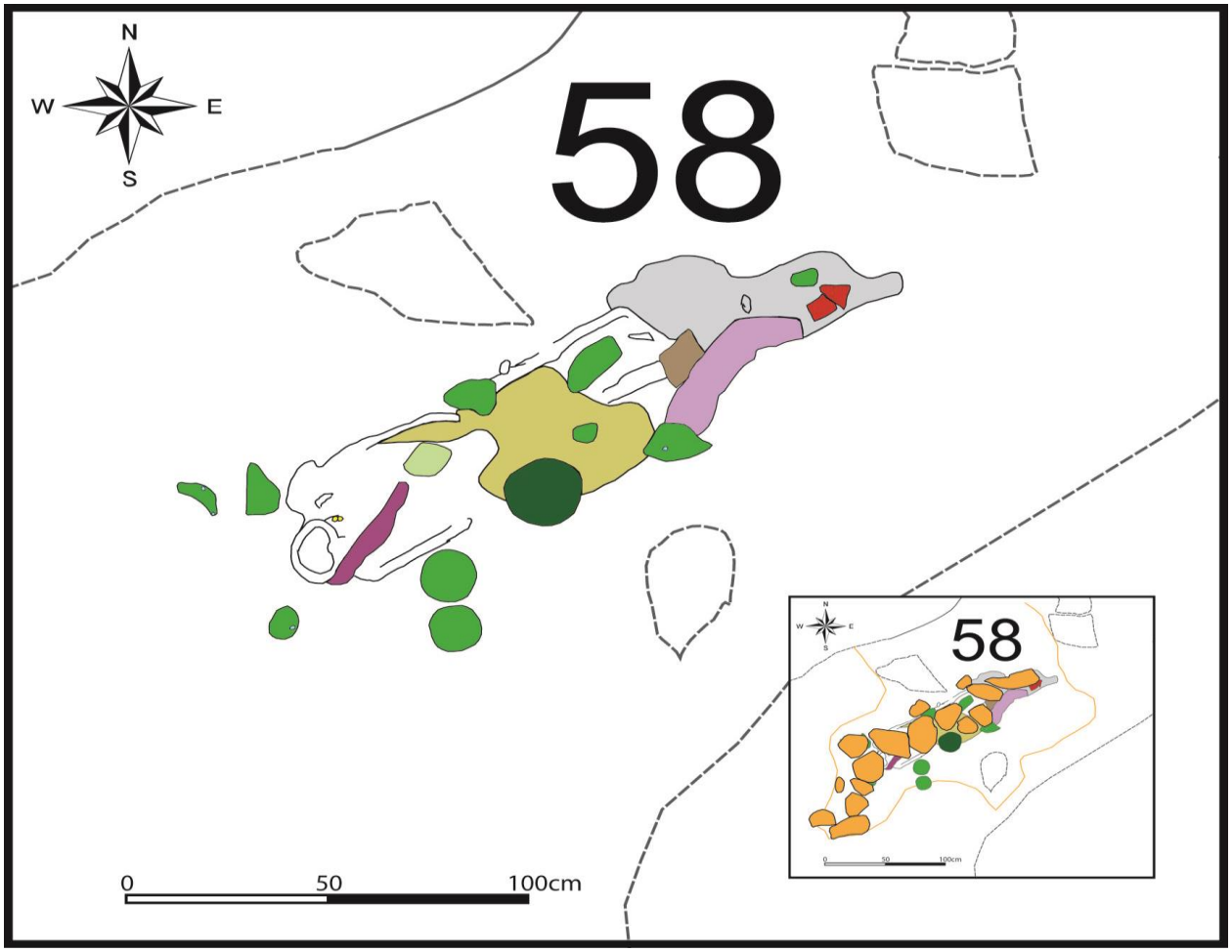

Plate A-59. Burial 58, single person burial: coffin burial, extended on back, right knee extended, left hand on pelvis, aligned WSW-ENE (head to feet). Wood fragments, and iron nails (5) represent coffin remains, including circular piece of charred wood located 10 cm above skeleton. Textile covers portion of left torso, pelvis and upper thighs, and a mass of unidentified organics (textile? wood? baleen?) over left abdomen. Grave fill artefacts include two roof tile fragments on lower right leg, whalebone over right shoulder and chest, large baleen fragment partially located in buried sod and overlapping right leg at grave level. Inset depicts grave marker rocks and grave pit outline observed during excavation.

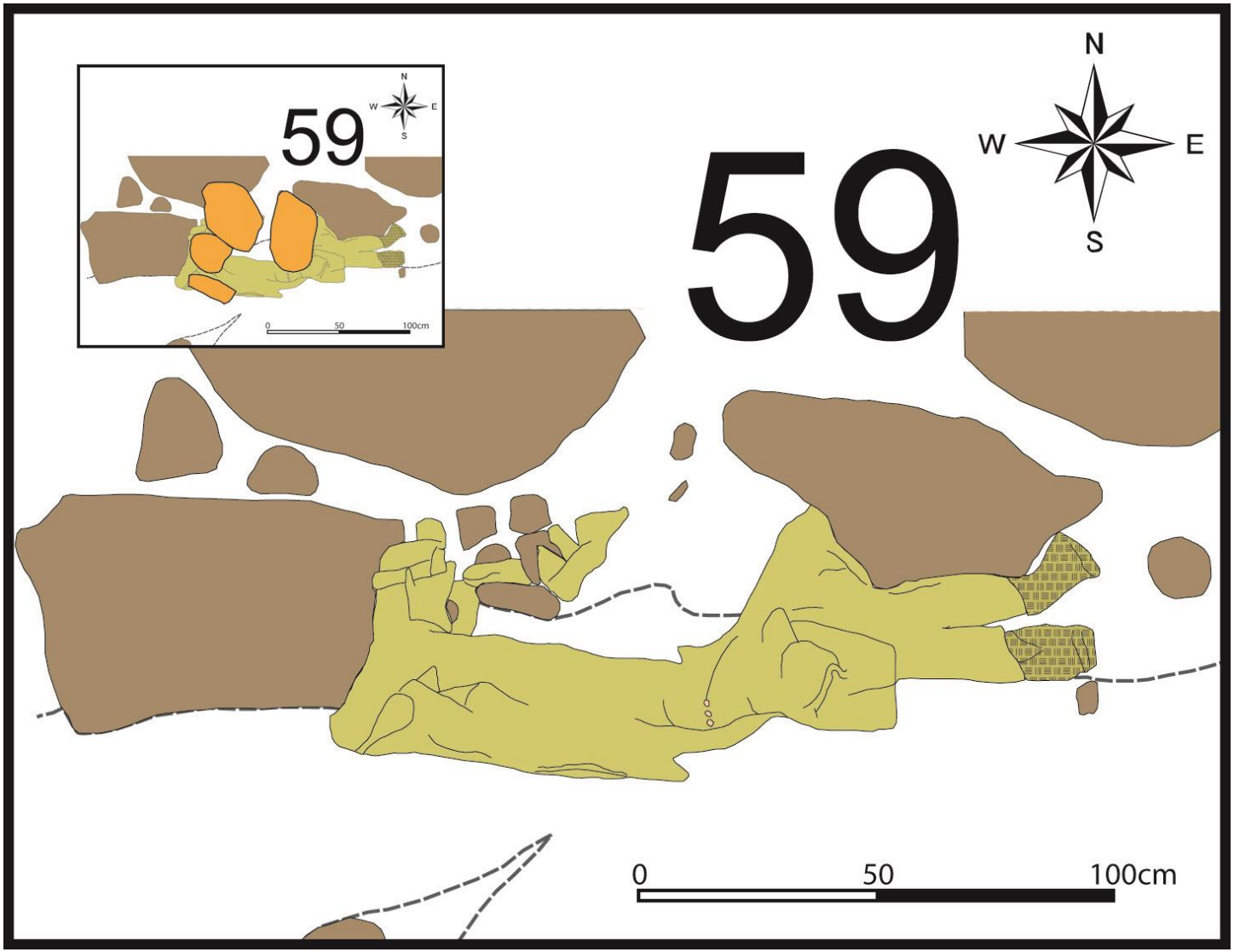
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Plate A-60. Burial 59, single person burial: represented by hair, finger nails and toe nails; textile suggests semi-flexed burial on back but tilted to left side, knees extended and knees together, right arm extended with hand on pelvis, head described as lateral to right shoulder (but map suggests left shoulder but unlabelled), aligned W-E (head to sacrum) and feet oriented ENE. Feature originally suspected to be a well; human remains resting in natural crevice or gully between bedrock outcrops (northern half) and along sloping bedrock (southern half). Costume represents burial position but constant water seeping from west side of burial has altered preservation and position of textile. Textile costume includes shirt, jacket, leggings or socks, leather shoes, and a knit cap; unmapped artefacts include an organic "yellow slime", small bone fragments, and an iron lance/dagger all located beneath textile costume. Unmapped grave fill artefacts include wood chips, baleen fragment found by foot, and a large piece of wood found parallel to and north of body. Inset depicts grave marker rocks.

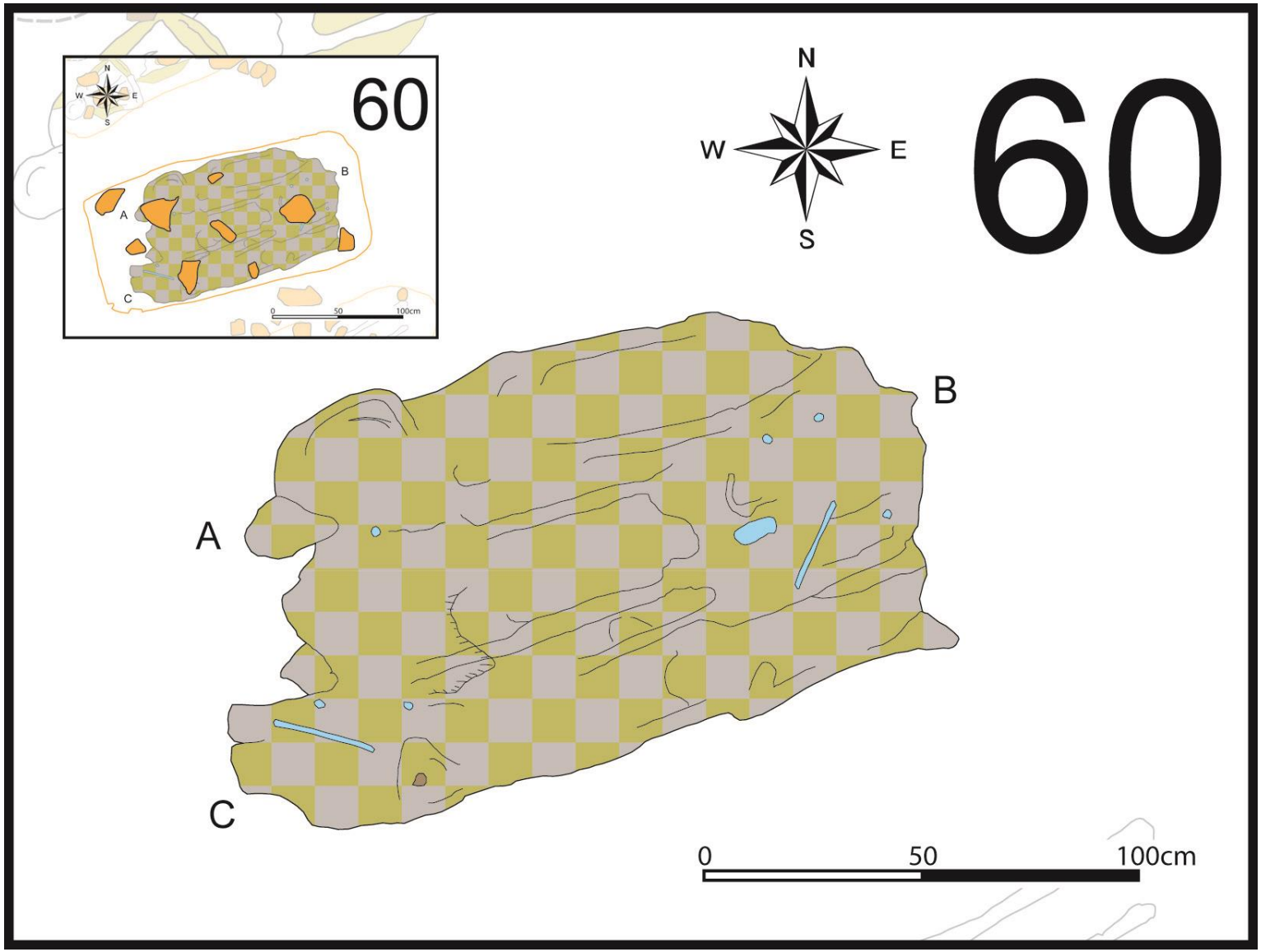
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Plate A-61. Burial 60, three person burial: fragmented and degraded bone with textile involvement; (A) extended burial on back, knees mixed (right extended, left semi-flexed), ankles cross, hands on chest/waist, aligned WSW-ENE (head to feet), textile (breeches, shirt or jacket, and one leather shoe), piece of iron, possible small nails; (B) extended burial on back, knees mixed (right semi-flexed, left extended), feet together, aligned ENE-WSW, textile (shirt, a second torso layer, breeches, possible stockings), several pieces of iron over chest and upper arms; (C) extended burial on back, feet apart, aligned W/WSW-ENE (head to feet), textile shoes, iron key and knife blade over chest. Unmapped grave fill artefacts include roof tile fragment and possible iron nails. Large piece(s) of textile involve all three individuals; one piece appears to go over the chest of B and feet of A and C; lower legs of B covered with textile which appears to extend over A's right shoulder and over C's upper body. It was impossible to determine the extent of textile over C's upper body as the area was described as "mushed". Inset depicts grave marker rocks and grave pit outline observed during excavation.

Post-field analyses by CCI conservators further identified the metal artefacts: a leather pouch holding an iron key; a textile pouch containing an iron key, three iron nails and two copper alloy lace ends; as well as the following loose artefacts, four iron knives, an iron key, two possible iron blade fragments, a tinned iron ring thought to be a garment closure, and two unidentified iron objects (Williams 1992:2-13).

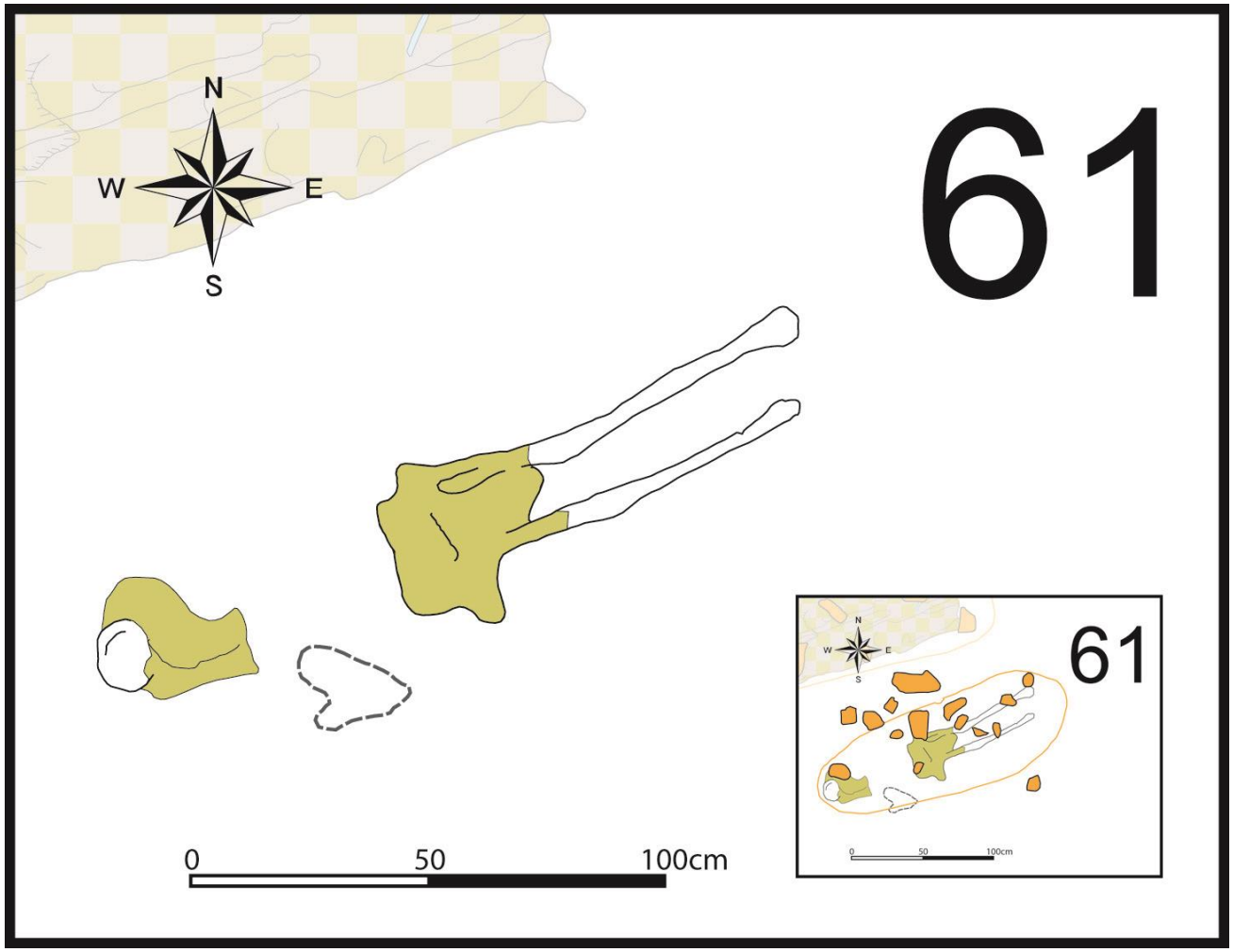

Plate A-62. Burial 61, single person burial: possible disturbed burial, extended burial on back, knees parallel, feet apart, aligned WSW-ENE (head to feet). Textile located over skull, shoulders, upper torso, pelvis, and upper thighs. Unmapped endblade near left foot suspected to be from grave fill. Jefferson (1986:123) suggests the burial was disturbed ("dug into") over the torso and arm areas, shown on the map as an area void of organics or textile. Inset depicts grave marker rocks and grave pit outline observed during excavation.

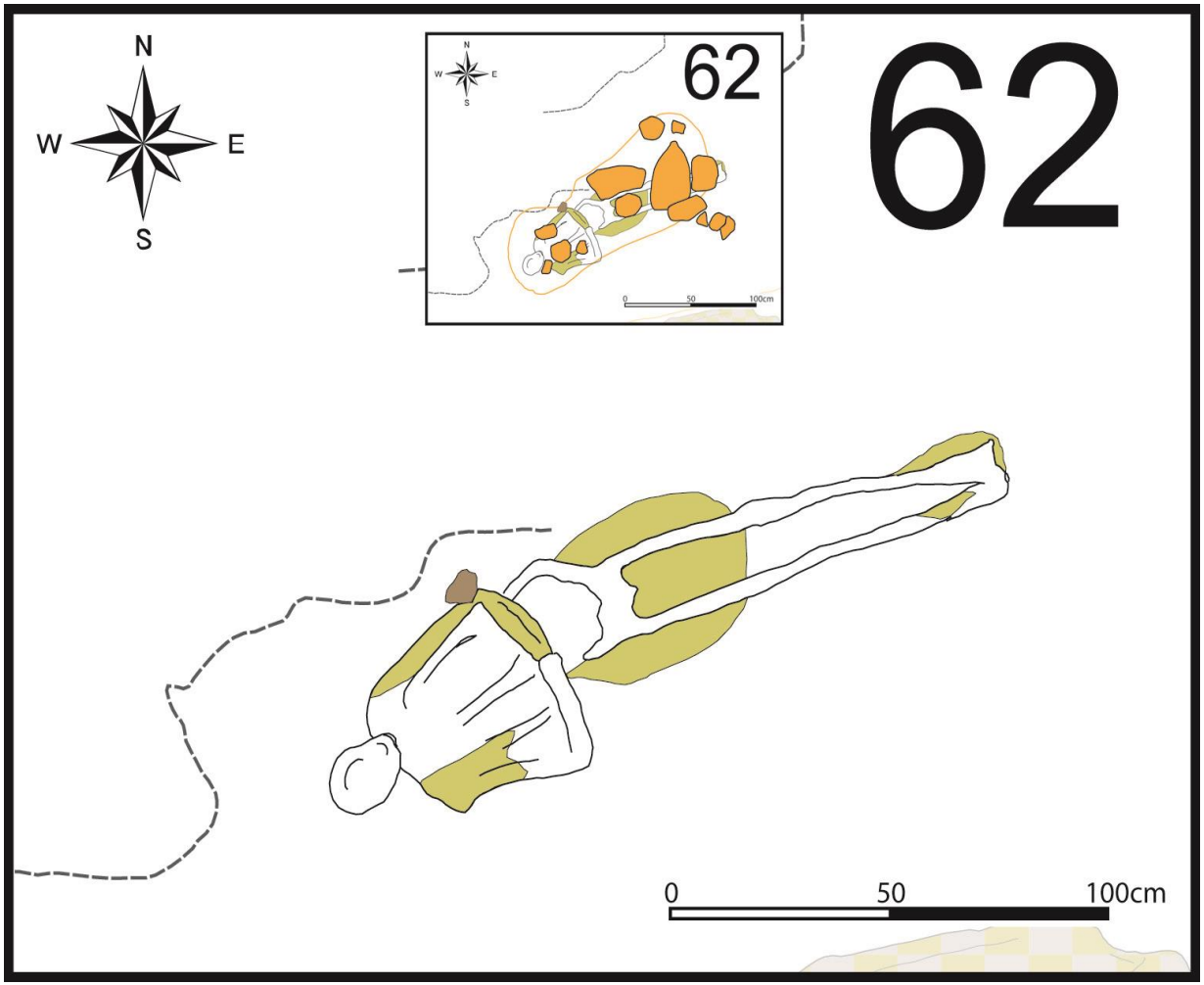

Plate A-63. Burial 62, single person burial: extended burial on back, feet together, hands cross right over left on waist/pelvis, aligned SW-NE (head to sacrum) and feet ENE due to bedrock outcrop. Textile over left arm and right shoulder, under pelvis and thighs, over right ankle and under left foot. Unmapped grave fill artefacts include a possible seal or polar bear bone within grave fill; and whalebone and piece of lead shot above grave fill near grave marker rocks. Inset depicts grave marker rocks and grave pit outline observed during excavation.

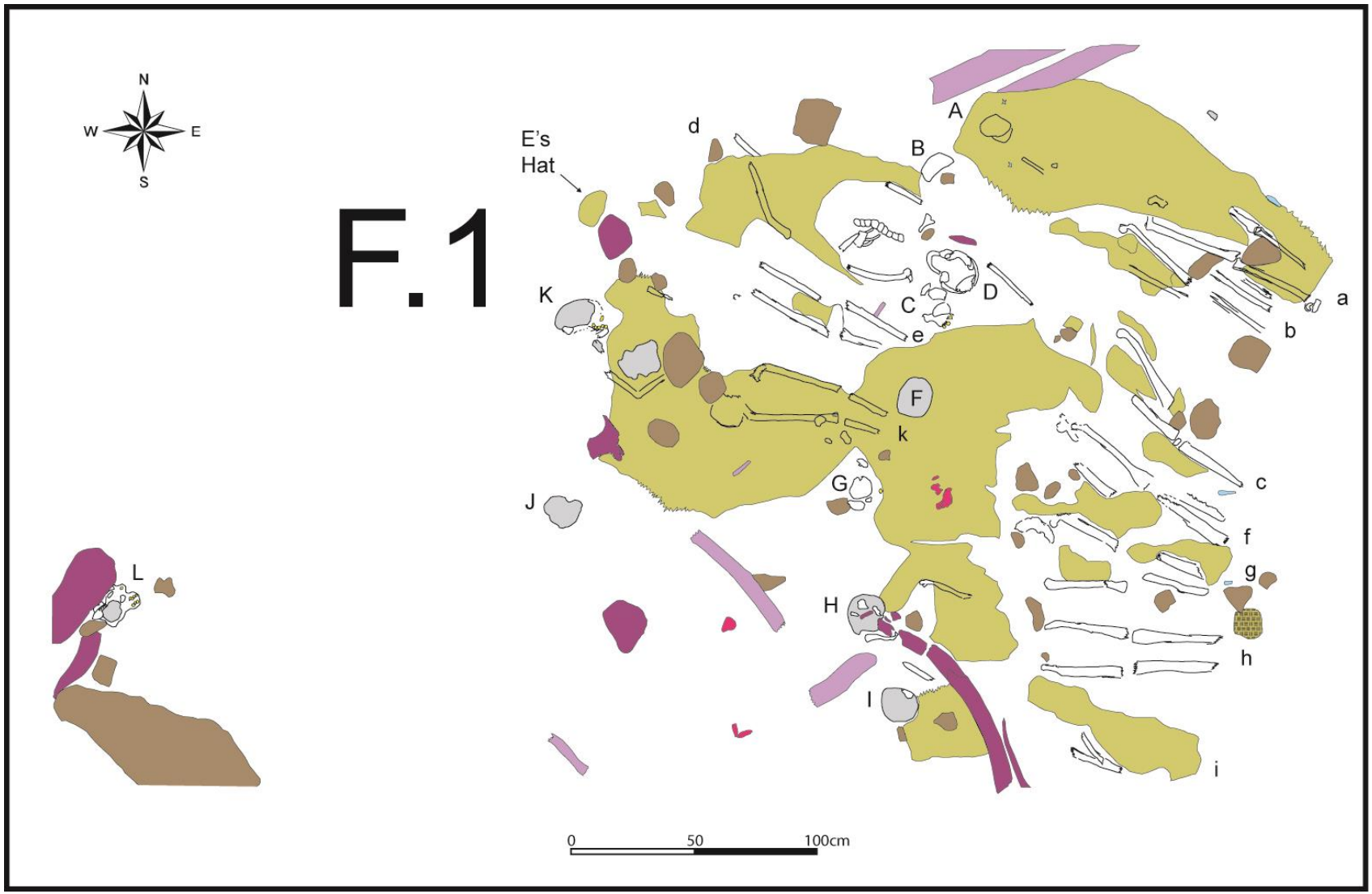
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Plate A-64. Feature 1, multiple person burial (12 person minimum): (A) extended burial on back, aligned WNW-ESE (head to ankles), textile covering and surrounding all except portions of the right thigh, left knee, and both feet; iron nail along edge of textile outside left knee, fishhook located north of skull, metal buckle near A's right shoulder (adjacent to B's left shoulder); unmapped artefacts include a small iron eyelet recovered from textile; (B) suggested semi-flexed burial on right side, knees extended, head rotated right, aligned WNE-ESE (head to tibiae), textile involvement around portions of torso, pelvis and thighs; (C) suggested semi-flexed burial on right side(?), knees together, right knee extended, aligned WNW-ESE (head to sacrum) and right ankle oriented SE, textile covers portions incompletely from neck to mid-tibiae, iron nail near distal right tibia, and insect casings recovered from textiles; (D) semi-flexed burial on back, suggests knees flexed and collapsed right, left hand on chest, aligned ESE-WNW (head to sacrum) and knees oriented NW, textile from mid-humeri to knees and possibly as far as feet, if knees flexed as thought; (E) extended burial resting on back or right side, knees extended, suggested feet together, hat placement suggests body aligned WNW-ESE ("hat" to tibiae), textile includes fragments over left shoulder and between thighs, and a hat; (F) semi-flexed burial, possibly on right side or back, aligned WNW-ESE (head to tibiae), textile primarily around head and chest with additional patches around right leg and both knees; (G) extended burial on back, ankles suspected together, aligned WNW-ESE (head to tibiae), textile involvement around torso, arms, left hip, left leg, and between thighs, and iron nail located between feet; (H) extended burial on back, aligned W-E (head to feet), textile across torso, left shoulder and skull, leather (shoe?) between H's left foot and G's right foot; (I) suggested semi-flexed burial, legs cross left over right, suggested alignment is WNW-ESE (head to legs), textile over upper torso and shoulders, left hip, and along the outside of left leg; (J) represented by skull and tooth fragments only, possible association of textile located NE of skull and may suggest orientation of infracranial skeleton; (K) extended burial on back, right hand on chest, aligned WNW-ESE (head to feet), textile involvement over skeleton except right shoulder and skull; (L) represented by skull and tooth fragments only, located west of other individuals and may represent disturbance. Faunal remains found across burial feature, including whalebone, seal bone, and baleen.

Note: Upper case letters ("A") identify individuals on or near their skull, lower case letters ("a") identify individuals on or near their feet.

Appendix B: Osteometric Catalogue

Burial 1
Occupancy: 11 (min.)

Individuals: A, C, E, F
Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: indeterminate (? non-juvenile)

Individuals: B, D, G, H, I, J, K
Preservation: poor
Recovery success: none; recorded-reburied
Sex: indeterminate
Age: indeterminate

Burial 2
Occupancy: 2

Individuals: A, B
Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: (A) non-juvenile; (B) undetermined

Burial 3
Occupancy: 1

Preservation: good
Recovery success: complete
Sex: male
Age: old adult (45-65 years)
Stature: 157.6 cm +/- 3.27 (femur)

Burial 4
Occupancy: 4

Individuals: A, B, C, D
Preservation: good
Recovery success: complete
Sex: (A, B, C) male; (D) ? male
Age: (A) young adult (20-25 years); (B) middle to old adult (25-45 + years); (C) young to middle adult (24-45 years); (D) middle to old adult (30-50 years)
Stature: (A) 167.6 cm +/- 3.27 (femur); (B) 164.2 cm +/- 4.05 (humerus); (C) 172.3 cm +/- 3.27 (femur); (D) 166.7 cm +/- 3.27 (femur)

Burial 5
Occupancy: 2

Individuals: A, B
Preservation: good
Recovery success: complete
Sex: (A, B) ? male
Age: (A) young to middle adult (19-35 years); (B) young to middle adult (19-40 years)
Stature: (A) 168.1 cm +/- 4.05 (humerus); (B) indeterminate

Burial 6
Occupancy: 6

Individuals: A, B, C, D, E, F
Preservation: good
Recovery success: complete
Sex: (A, C, D, F) ? male; (B) male; (E) indeterminate
Age: (A, B) young to middle adult (>25 years); (C) middle to old adult (>30 years); (D) young adult (17-30 years); (E) young adult (>17 years); (F) ? young adult

Burial 7
Occupancy: 1

Preservation: good
Recovery success: complete
Sex: male
Age: middle adult (31-45 years)
Stature: 160.4 cm +/- 3.27 (femur)

Burial 8
Occupancy: 2

Individuals: A, B
Preservation: fair
Recovery success: complete
Sex: (A, B) ? male
Age: (A) young adult (19-30 years); (B) middle to old adult (25-50 years)

Burial 9
Occupancy: 4

Individuals: A, B, C, D

Preservation: good
Recovery success: complete
Sex: (A, B) ? male; (C, D) indeterminate
Age: (A) young to middle adult (25-45 years); (B) non-subadult; (C, D) young to middle adult (20-45)

Burial 10
Occupancy: 4

Individuals: A
Preservation: poor
Recovery success: none; recorded-reburied

Sex: indeterminate
Age: indeterminate

Individuals: B, C, D
Preservation: poor
Recovery success: complete (fragmentary)
Age: indeterminate
Sex: indeterminate

Burial 11
Occupancy: 2

Individuals: A, B
Preservation: good
Recovery success: complete
Sex: (A) male; (B) ? male
Age: (A) old adult (40-60 + years); (B) middle to old adult (35-50 + years)
Stature: (A) 157.0 cm +/- 3.27 (femur); (B) indeterminate

Burial 12
Occupancy: 2

Individuals: A, B
Preservation: poor
Recovery success: complete
Sex: indeterminate
Age: (A) young adult (16-30 years); (B) young to middle adult (25-40 years)

Burial 13
Occupancy: 4

Individuals: A, B, C, D

Preservation: poor
Recovery success: incomplete; sampled-reburied

Sex: indeterminate
Age: (A, C, D) indeterminate; (B) non-subadult

Burial 14
Occupancy: 1

Preservation: good
Recovery success: complete
Sex: indeterminate
Age: young adult (18-24 years), tooth crowding could be misleading

Burial 15
Occupancy: 1

Recovery success: complete
Sex: indeterminate
Age: young to middle adult (19-40 years)
Sex: indeterminate

Burial 16
Occupancy: 1

Recovery success: complete
Sex: indeterminate
Age: ? non-subadult
Sex: indeterminate

Burial 17
Occupancy: 4

Individuals: A, B, C
Preservation: poor
Recovery success: none; recorded-reburied
Age: indeterminate
Sex: indeterminate

Individuals: D
Preservation: poor
Recovery success: incomplete; sampled-reburied
Age: indeterminate
Sex: indeterminate

Burial 18
Occupancy: 7

Individuals: A, B, C, D, F, G
Preservation: poor
Recovery success: incomplete; sampled-reburied
Age: (A, G) indeterminate; (B, C, D, F) ? non-juvenile
Sex: indeterminate

Individuals: E
Preservation: poor
Recovery success: none; recorded-reburied
Age: indeterminate
Sex: indeterminate

Burial 19
Occupancy: 1

Recovery success: complete
Sex: indeterminate
Age: young adult (17-25 years)

Burial 20
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: non-subadult

Burial 21
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: indeterminate

Burial 22
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: indeterminate

Burial 23
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: indeterminate

Burial 24
Occupancy: 3

Individuals: A, B, C
Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: indeterminate

Burial 25
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: indeterminate

Burial 26
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: indeterminate

Burial 27
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: indeterminate

Burial 28
Occupancy: 3 (plus)

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: (A, B) indeterminate; (C) male (occipital and mandibular frags)
Age: (A, B) indeterminate; (C) non-juvenile

Burial 29
Occupancy: 1

Preservation: poor
Recovery success: none; recorded-reburied
Sex: indeterminate
Age: indeterminate

Burial 30
Occupancy: 1

Preservation: poor
Recovery success: none; recorded-reburied
Sex: indeterminate
Age: indeterminate

Burial 31
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: non-juvenile

Burial 32
Occupancy: 1

Preservation: poor
Recovery success: none; recorded-reburied
Sex: indeterminate
Age: indeterminate

Burial 33
Occupancy: 1

Preservation: poor
Recovery success: none; recorded-reburied
Sex: indeterminate
Age: indeterminate

Burial 34
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: indeterminate

Burial 35
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: non-juvenile

Burial 36
Occupancy: 8

Individuals: A, B, C, D, E, F, G, H
Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: (A, C) middle adult (25-45 years); (B, D, E, F, G, H, I) non-juvenile

Burial 37
Occupancy: 1

Preservation: fair-good
Recovery success: complete
Sex: male
Age: middle adult (25-45 years)

Burial 38
Occupancy: 2

Individuals: A, B
Preservation: poor; post-depositional surface erosion, cracking, and warpage
Recovery success: incomplete, sampled-reburied
Sex: indeterminate
Age: (A) ? juvenile (assigned age of approx. 12 years in the field but questioned because of erupted LRM3 –is this because of commingled teeth between A and B); (B) ? young adult (19-30 years). Teeth became commingled in the field which complicates proper age assessment.

Burial 39
Occupancy: 2

Individuals: A, B
Preservation: poor
Recovery success: none; recorded-reburied
Sex: indeterminate
Age: indeterminate

Burial 40
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: ? non-juvenile

Burial 41
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: indeterminate

Burial 42
Occupancy: 1
MNI: 2

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: indeterminate (non-juvenile)

Burial 43
Occupancy: 2

Individuals: A, B
Preservation: poor
Recovery success: (A) incomplete, sampled-reburied; (B) ? none, recorded-reburied
Sex: (A) indeterminate; (B) indeterminate
Age: (A) ? young adult (17-25 years), *likely lower third molar; (B) indeterminate

Burial 44
Occupancy: 1

Preservation: poor
Recovery success: none; recorded-reburied
Sex: indeterminate
Age: indeterminate

Burial 45
Occupancy: 1

Preservation: poor
Recovery success: none; recorded-reburied
Sex: indeterminate
Age: indeterminate

Burial 46
Occupancy: 1

Preservation: poor
Recovery success: none; recorded-reburied
Sex: indeterminate
Age: indeterminate

Burial 47
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: indeterminate

Burial 48
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: ? non-juvenile (> 18 years, based epiphyseal fusion)

Burial 49
Occupancy: 1

Preservation: poor
Recovery success: none; recorded-reburied
Sex: indeterminate
Age: indeterminate

Burial 50
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: ? “child”

Burial 51
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: young to middle adult (19-40 years)

Burial 52
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: indeterminate

Burial 53
Occupancy: 1

Preservation: poor
Recovery success: none; recorded-reburied
Sex: indeterminate
Age: indeterminate

Burial 54
Occupancy: 1

Preservation: poor
Recovery success: none; recorded-reburied
Sex: indeterminate
Age: indeterminate

Burial 55
Occupancy: 1

Preservation: poor
Recovery success: none; recorded-reburied
Sex: indeterminate
Age: indeterminate

Burial 56
Occupancy: 1

Preservation: poor
Recovery success: none; recorded-reburied
Sex: indeterminate
Age: indeterminate

Burial 57
Occupancy: 1

Preservation: poor
Recovery success: complete; block-lift
Sex: indeterminate
Age: indeterminate

Burial 58
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: indeterminate

Burial 59
Occupancy: 1

Preservation: poor
Recovery success: complete, fragmentary
Sex: indeterminate
Age: indeterminate

Burial 60
Occupancy: 3

Individuals: A, B, C
Preservation: poor
Recovery success: complete, fragmentary
Sex: indeterminate
Age: (A-C) ? non-juvenile

Burial 61
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: indeterminate

Burial 62
Occupancy: 1

Preservation: poor
Recovery success: incomplete; sampled-reburied
Sex: indeterminate
Age: ? young adult (18-25 years); LLM3 appears incompletely erupted

Burial Feature 1
Occupancy: 12 (approx.)

Individuals: A, B, C, D, E, F, G, H, I, J, K, L
Preservation: poor
Recovery success: complete
Sex: (A, B, H) ? male; (C, D, E, F, G, I, J, K, L) indeterminate
Age: (A, B, C, H) non-juvenile; (D, E, F, G, I, J, K, L) indeterminate