



Excavations at the churchyard in Igaliku, the Norse bishop see at Garðar, July 2019

KNK 4201

JANUARY 15 2020

Work Package 3.1: Human Experiences: health, well-being and trade-offs

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Activating Arctic Heritage



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1. Introduction

Archaeological investigations at Garðar cemetery in Igaliku were performed from 4 - 21 July 2019. The research was a collaboration between researchers from the National Museum of Denmark, the Greenland National Museum's Arctic Vikings Field School and the Department of Forensic Medicine, University of Copenhagen.

This work contributed to the on-going research project: **Human Experiences: health, well-being and trade-offs**, a work package under the umbrella of the Carlsberg-funded project **Activating Arctic Heritage** (PLs Bjarne Grønnow & Christian Koch Madsen). AAH is an interdisciplinary research project that builds on new opportunities resulting from Greenland's two recent UNESCO appointments of Kujataa (2017) and Aasivissuit-Nipisat (2018). The project explores this historic moment of transition in Greenland, where attention to Greenland's cultural heritage is quickly shifting from the local to global scale. The project includes three (3) main research themes:

Theme 1: *Innovative theory development: Dialogues on cultural heritage and society*

Theme 2: *New scientific methods for exploring UNESCO World Cultural Heritage in Greenland*

Theme 3: *Exploring the cultural history of UNESCO areas*

Work package **Human Experiences: health, well-being and trade-offs** is part of Theme 3. The senior research group comprises Jette Arneborg, Niels Lynnerup and Dorthe Dangvard Pedersen. The objective of the work package is to expand our knowledge about the Norse Greenlanders ca. AD 1000-1450 and to improve our understanding of the interplay between humans and their environments, with a focus on the individual health and well-being of the Norse Greenlanders. This includes examining how inequality and certain trade-offs affected the quality of life for different social groups within Norse Greenland. The main focus of this bio-archaeological research is accomplished through the examination of individual skeletons, skeletal remains and the orientation and burial topography of cemeteries in the Eastern Settlement.

Fieldwork at Garðar cemetery was assisted by students participating in the 2019 Greenland Arctic Vikings Field School (AVFS). The program was a partnership between the Greenland National Museum and Archives and Institute for Field Research (IFR). The Arctic Viking program hosted twelve students in 2019 (8 international and 4 Greenlandic students). AVFS 2019 was run as part of an on-going effort by the Greenland National Museum to train students in basic archaeological field methods and for students to gain insights into the cultural history of Greenland. During the program, considerable emphasis was also placed on educating the students on the growing threats to archaeology in South Greenland due to climate change and tourism. The excavations at Garðar cathedral were a high point for the students, as the undisturbed portions of the medieval cemetery produced several individual burials with moderately preserved human skeletal remains.

2. Participants



Figure 1. Participants in the excavations in Igaliku 2019. From the Danish National Museum: Jette Arneborg, who is responsible for the AAH research project *Human Experiences: health, well-being and trade-offs*. Stud.mag. Frederikke Reimar, National Museum of Denmark was archaeological assistant.

Instructors:

Name	Affiliation
Jette Arneborg, Senior Researcher	National Museum of Denmark
Christian Koch Madsen	Greenland National Museum
Hans Harmsen	Greenland National Museum
Michael Nielsen	Greenland National Museum
Ramona Harrison	University of Bergen, Norway
Konrad Smiarowski	University of Bergen, Norway
Elie Pinta	Université Paris 1 Panthéon-Sorbonne
Frederikke Reimar	National Museum of Denmark
Gunnar Grímson	Warm Arctic, LLC and University of Iceland

Students:

Name	Affiliation
Kaylee Baxter	University of Toronto, Canada
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James Wright	University of Toronto, Canada
Joshua Needham	University of Alberta, Canada
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Mirandi Bakken	Montana State University, USA
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Birte Olsen	Ilisimatusarfik, University of Greenland
Helena Laila Marie Brandt	Aarhus University, DK
Avaaraq Bendtsen	Aarhus University, DK
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3. Field diary

Jette Arneborg (JA), Hans Harmsen (HA), Frederikke Reimer (FR), Elie Pinta (EP).

Date	Activities
4.7.2019	Frederikke and Jette arrive at Igaliku after a problem-free travel from Copenhagen. Frederikke put up in the tent camp of the IFR field school – Jette put up in one of Malene Egedes camping pods. Weather: sun warmth and almost no wind.
5.7.2019	Trench opened in the NE corner of the church yard. Weather: sun warmth and almost no wind.
6.7.2019	Excavation. Weather: sun warmth and almost no wind – the weather forecast for the coming days: strong winds “Sydost”.
7.7.2019	Day off. Weather: drizzle during the night, morning warm winds – overcast - “sydost” are brewing. Jette: visiting the excavations at the “assembly site”.
8.7.2019	Excavations cancelled because of the “sydost”. Instead field school lectures at Igaliku’s communal house. Jette: on Norse Greenland churches, the excavations at Ø63 and on walrus. Christian: Thule culture Konrad og Ramona: zoo archaeology
9.7.2019	Excavations – the first skeletal parts uncovered in the southern part of the dig. Weather: after a little wind in the morning sunny and mild.
10.7.2019	Excavation. Grave A and grave B identified. A new grave C. Weather: after a cool morning sun and warmth.
11.7.2019	Excavation. In the northern part of excavation: still digging in modern fill. In the southern part of the dig continued excavation of the graves A, B and C. Weather: after a cool, misty morning sun, warmth and almost no wind.
12.7.2019	Most students on a field trip to Kujalleq – at the excavation: Hans, Helena, Malu, Avaaraq, Loyalty and Jette. Northern part of dig: modern fill with ashes apparently for cleaning a stove (from the house that once was sitting in the NE-corner of the church yard?). More skeletal parts in secondary positions. Continued excavations of the graves A, B and C. Weather: Sunny and warmth – almost no wind.
13.7.2019	Day off Weather: Sunny and warmth – almost no wind.
14.7.2019	Excavation. Levelling the foundation stones of the church. Weather: Sunny and warmth – almost no wind.
15.7.2019	Excavation. Test coring. Apparently, there is a layer of burials underneath the uncovered graves/skeletons. Weather: Sunny and warmth – almost no wind.
16.7.2019	Excavation and levelling.
17.7.2019	The unit measured – Photos by drone. Jette decides which skeletons to unearth and which to leave in the ground. Graves A (both skeletons), B, C, and F are to be unearthed; graves D, E, and G to stay.
18.7.2019	Jette travels to Narsarsuaq – continues to Copenhagen in the afternoon. Frederikke Reimer continues the diary from here. Locals of Igaliku invited to see the excavation in the afternoon. Weather: in the morning cloudy – during the day sunny and hot.
19.7.2019	Skeletons documented and unearthed by Frederikke Reimer and Konrad Smiarowski. North and east profiles of trench documented. Cut E covered with plastic. Backfilling. Weather: hot and sunny.
20.7.2019	Day off.
21.7.2019	Stray finds of human bones reburied in the NW corner of unit 2 (Elie’s unit) on the churchyard. Packing of skeletons for shipping to Copenhagen. Excavation site closed down and cleaned up. Weather: Foggy.
22.7.2019	Shipment of skeletons and equipment arranged in Narsarsuaq.

4. Background

Sub-surface investigations in 2019 were performed to recover undisturbed human remains and associated data related to the Norse settlement period between 14th and early 15th century. This was done with the purpose of comparing mortuary data from other churchyards in the Eastern Settlement ca. early 10th–12th centuries AD (eg. Tjodhildes churchyard, excavated in the early 1960s and the cemetery at Ø64 excavated in 2007-2008 and 2010).

The cemetery at Garðar has been excavated several times over the past century—both by professional archaeologists and amateur prospectors. Stone material from Garðar has also been

collected and used by local people for use in house construction. Portions of the cathedral area have also been used as private gardens.

Due to the fact that so much disturbance has occurred at Garðar, one of the main challenges prior to fieldwork was to identify the location of potentially undisturbed portions of the medieval cemetery.

4.1. Previous investigations in Igaliku and Garðar cemetery

Early investigations of Norse churches and cemeteries in Greenland focused primarily on the identification of the ruins (eg. graves with skeletons often indicated the presence of a church) and architecture. The first deliberate collection of human skeletal remains for bio-archaeological/physical anthropological studies was performed in 1926 by Poul Nørlund (see Nørlund 1930).

1723: Hans Egede did not reach Igaliku on his journey southwards from Nuuk in 1723, but the place was well-known and described to him by local Inuit Greenlanders.

1779: Aaron Arctander visited Igaliku in 1779 and described several ruin features. However, it is not possible to distinguish between the different buildings based on his descriptions.

1782: Anders Olsen and family settled in Igaliku in 1782 to raise cattle and much of their building material (i.e. stones) was taken from the Norse ruins.

1830: Pastors Mathiessen and Esmann and their assistant Kielsen visited Igaliku in 1830 after the discovery of a gravestone with runic characters (*Vigdis's grave stone*, repatriated and currently curated the Greenland National Museum and Archives). A hole was dug at Garðar, "...down to the first layer of soil," where the gravestone had originally been found. Here they supposedly found a skeleton. More sub-surface excavations were conducted in a 1.5 m radius of the remains and at least seven additional individuals were identified (Report in the National Museum of Denmark archives).

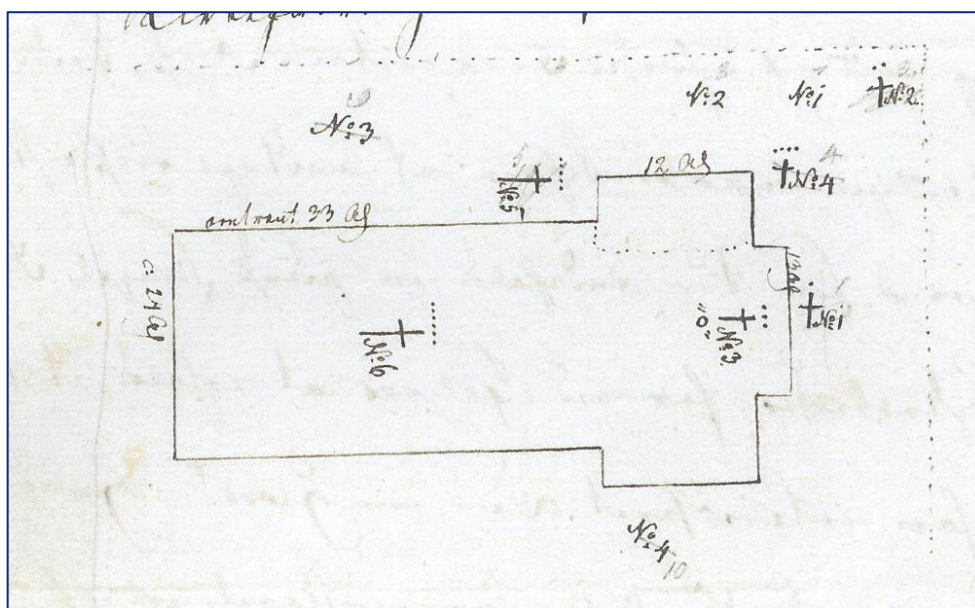


Figure 2. Vigdis's gravestone and the additional seven skeletons were found close to the wall on the north side of the church. Here marked with no. 5. on Pastor Esmann's sketch of the church from 1832.

1832: Pastor Esmann, with five men, spend four days excavating the church, from 5 - 8 August. On 10 August he sent his report, with a plan sketch of the cathedral, to the Royal Antiquarian Society in Copenhagen. According to Esmann's report:

- 5 August: the team excavated the cemetery close to the eastern side of the choir (no. 1 on the plan), and close to the cemetery wall north of the northern chapel (no 2 on the plan). They report skeletal remains and steatite sherds at a depth of ca. 1 m below the surface.
- 6 August: (a) team excavated inside the church where Esmann hypothesized the altar had stood (no. 3 on the plan): (b) hit a large stone and gave up the dig; (c) moved a little to the west (marked **ö** on the plan). At a depth of ca. 2 metres below the surface, found a stone lined grave with remains of an almost complete skeleton without a skull; (d) dug the northeast corner of the northern chapel. The team did not dig too far down and no artefacts or other materials identified (most likely no. 4 on the plan); (e) continued the excavations in the northern area of the north wall of the church where the *Vigdís stone* was found years before (no. 5 on the plan). No artefacts found; (f) team resumed exaction in the area under the supposed altar site.
- On 7 August continued the excavations under the supposed altar site. Found 4 or 5 narwhale crania at a depth of c. 1.4 m below the surface.
- On 8 August (a) excavation of the nave (no. 6 on the plan). Team found a small piece of church bell; (b) removed topsoil at four locations. No artefacts found (Report in the National Museum of Denmark archives).

1835: Pastor J.F. Jørgensen excavated for several days at Garðar church and cemetery. He reports only finding charcoal, a few pieces of steatite and small pieces of metal that he believed were part of the church bell (Report in the National Museum of Denmark archives).

1837: Pastor J. F. Jørgensen returns to Garðar from 5 - 11 June. For two days, 22 men were occupied with cleaning-up the church and the cemetery. Local Paul Egede saved them a good deal of work since he had already collected several flat flagstones from the cemetery for a wall he wanted to build around a new garden.

- On 9 June Jørgensen surveyed the entire southern and eastern part of the cemetery, digging deep holes and found nothing notable. Some workers cleared the church, however only found bones which the Greenlanders believed had belonged to their "...cattle, seals and white fish" (Report in the National Museum of Denmark archives).

1839: Pastor J. F. Jørgensen returns to Garðar. Excavated for eight days with 18 men, both inside the church and in the cemetery (on eastern and western sides of the church). Excavated deeper than previous times and found several burials in coffins and with textile fragments. However, preservation was poor, and nothing was brought back to Denmark. Jørgensen writes that the readers of his letter would be astonished when told that the team had to dig $2\frac{3}{4}$ to 3 *alen*, and sometimes 3 to 4 *alen* deep before they hit skeletons (1 *alen* equals approximately 63 cm) (Report in the National Museum of Denmark archives).

1926: Poul Nørlund and Aage Roussell

- On 23 July, Dr. Nørlund and Mr. Raklev, with 10 men, excavated inwards from the east side of the cemetery dike to a depth of approx. 0.5 m below the surface and immediately found human remains and fragments of clothing (Roussell diary, National Museum of Denmark archives).

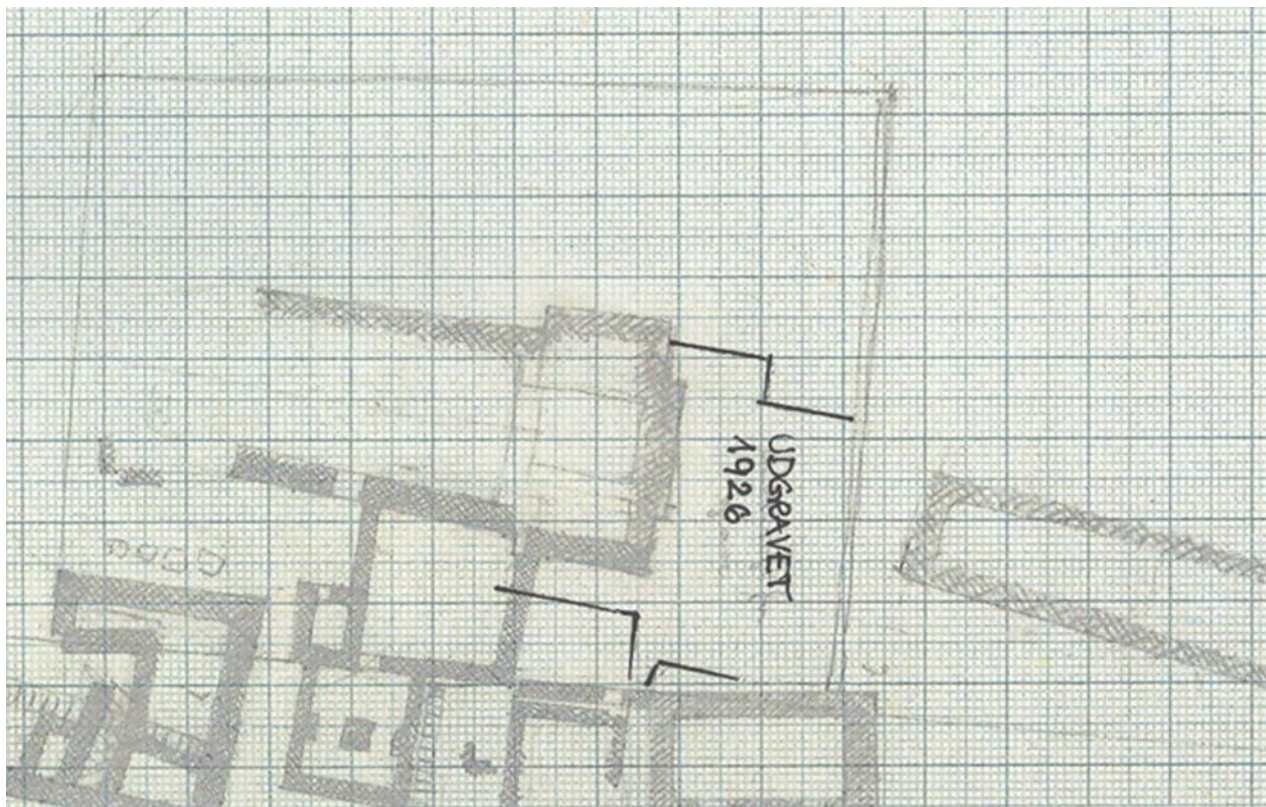


Figure 3. Nørlund's excavations 1926. Sketch by Aage Roussell 1926. National Museum of Denmark Archives.

Nørlund describes the original sub-stratum at Igaliku's terraced plain as a raised sea-floor with compact masses of shingle underlying a thin layer of humus, a few centimetres thick. This appears to be what he encountered in the west end of the cemetery. However, the original ground surface sloped at a gradient towards the shore. Nørlund suggested that up to about 70 cm of fill had been brought to the eastern part of the cemetery by the Norse to level the area and make grave digging easier. Because most graves were known to be in the east end of the cemetery, Nørlund's excavations focused on the south-eastern area. This included the whole area east of the church and south of the chancel. The entire interior of the church was excavated systematically, and scattered sample excavations were also made on the north and west sides of the churchyard (Nørlund 1930:58f).

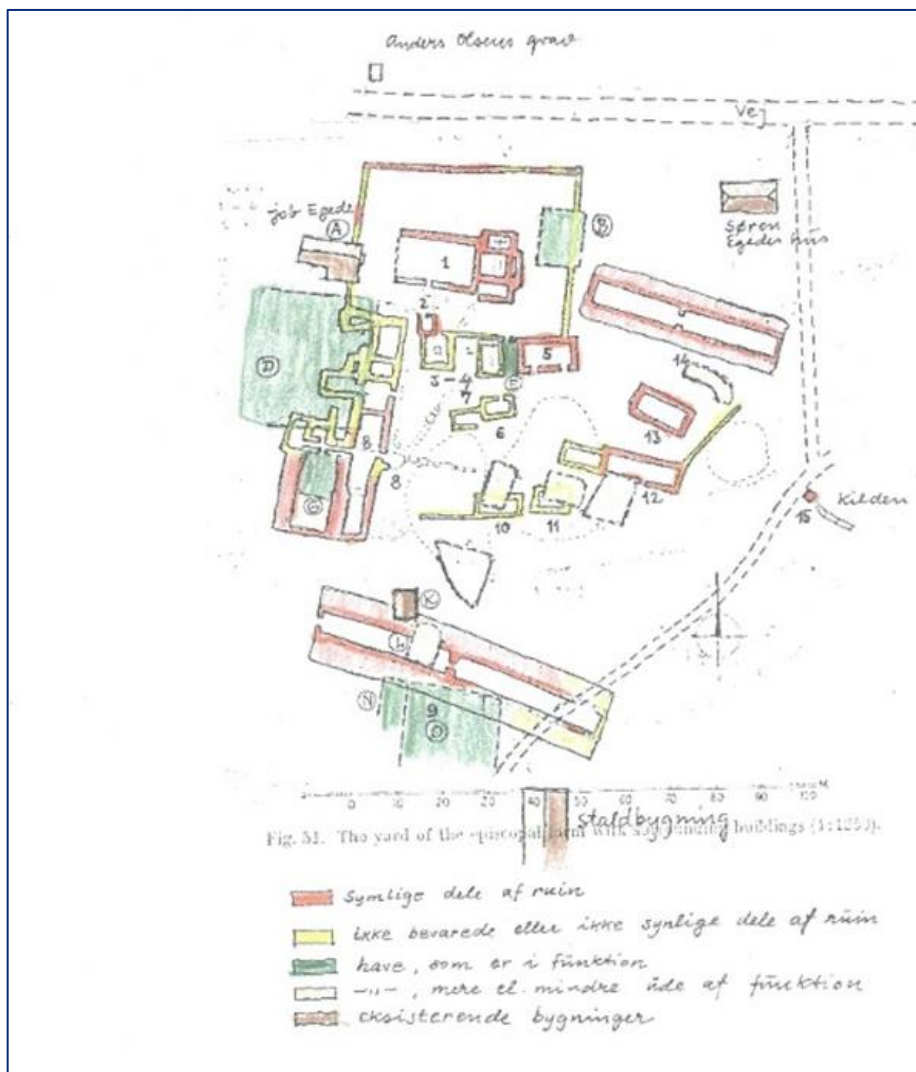


Figure 4. The situation in 1987. Red: visible remains of building. Yellow: destroyed or not visible remains of buildings, Green: gardens in use. White: garden more or less out of use. Brown: houses in use.

1987: Knud J. Krogh sketched the Garðar ruins at Igaliku, with houses and gardens in use at the time.

1991-1993: Knud J. Krogh cleans-up inside and around the church ruin. “When the National Museum in 1926, under the direction of Poul Nørlund, conducted the basic archaeological investigations of the diocese site, they left without undertaking a re-establishment ...” New fill was not added between 1991 and 1993 (Krogh 1994. Report in the National Museum of Denmark archives).

5. 2019 Investigations

The placement of the trench for the 2019 sub-surface investigations was decided by comparing and analyzing historical sources and previous archaeological survey reports. Photographs from the 1926 excavations show that there was a house in the NE corner of Garðar cemetery. By placing the 2019 trench between Poul Nørlund's excavation (east of the choir) and the foundations for the stone house, we hypothesized that we would be located inside the garden which Krogh described in 1987. The hope was that only the top layers (approximately a spade length deep) were disturbed by the garden.



Figure 5. Stone house in the NE corner of the cemetery. Photo Poul Nørlund 1926, National Museum of Denmark

Another trench was excavated on the north side of the cemetery in an area that had also been in use as garden until recent times (Figures 6 and 7).

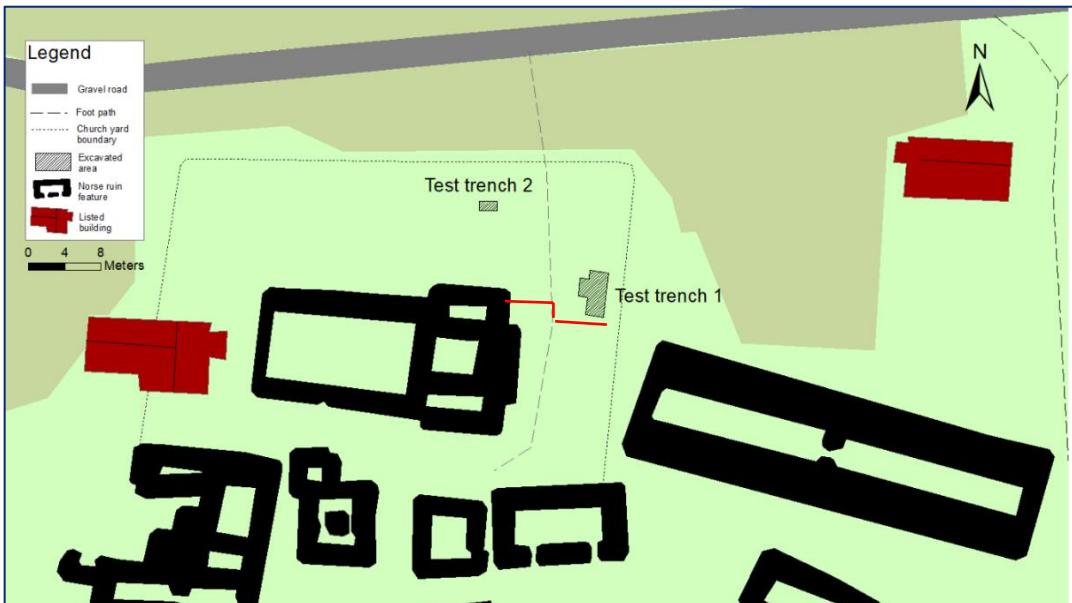


Figure 6. Location of the two test trenches 2019. The red line indicates the approximate northern edge of Poul Nørlund's 1926 excavations.



Figure 7. Location of the test trenches. Test trench 1 in red circle. Test trench 2 in blue circle. Drone photo: Hamsen 2019

5.1. Surveying

Orientation of the test area was based on a local grid system tied to a site datum (0-stone) positioned at N 67.61454°, E 47.7124°. Trench 1 was laid out along a transect grid running north to south, in the immediate area believed to possess the highest probability for discovery of undisturbed portions of the medieval cemetery. A second trench (Trench 2) was opened a few meters north of the datum in a location known to have been used as a garden. A dGPS was used to record the precise coordinates of the site datum, all trench corners (Trenches 1 and 2) and anchor ground control points used in the drone mapping. To measure vertical depth, a dumpy level was used to plan the site, with a relative height of +145 cm above the ground surface.



Figure 8. Test trench 1, in the red circle niv. = 0. Drone photo, Hans Harmsen 2019.

5.2. Test trench 1

Trench 1 measured 5 m from south to north and originally 2 m wide from east to west. After finding grave A and skeleton x31, the trench was expanded by 2 x 1 m to the west. It soon became clear that the northern and eastern parts of the trench consisted of one or more modern cuts. In situ medieval burials emerged in the south-western portions of the trench. The burials were extremely shallow, all measuring to a depth of approx. 20-30 cm below the modern surface. Feet were absent on all the skeletons, truncated by the cut that ran from west to east across the trench.

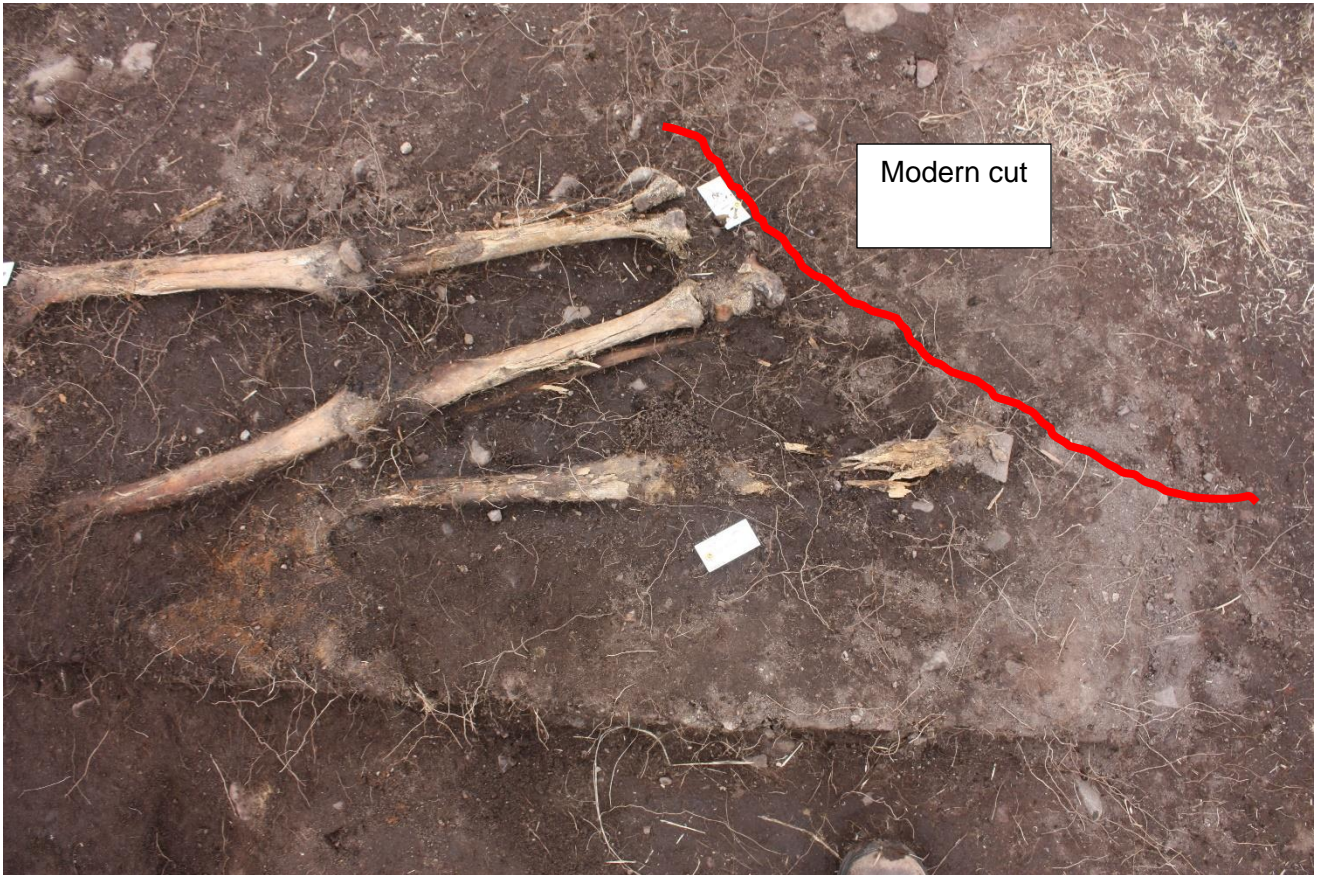
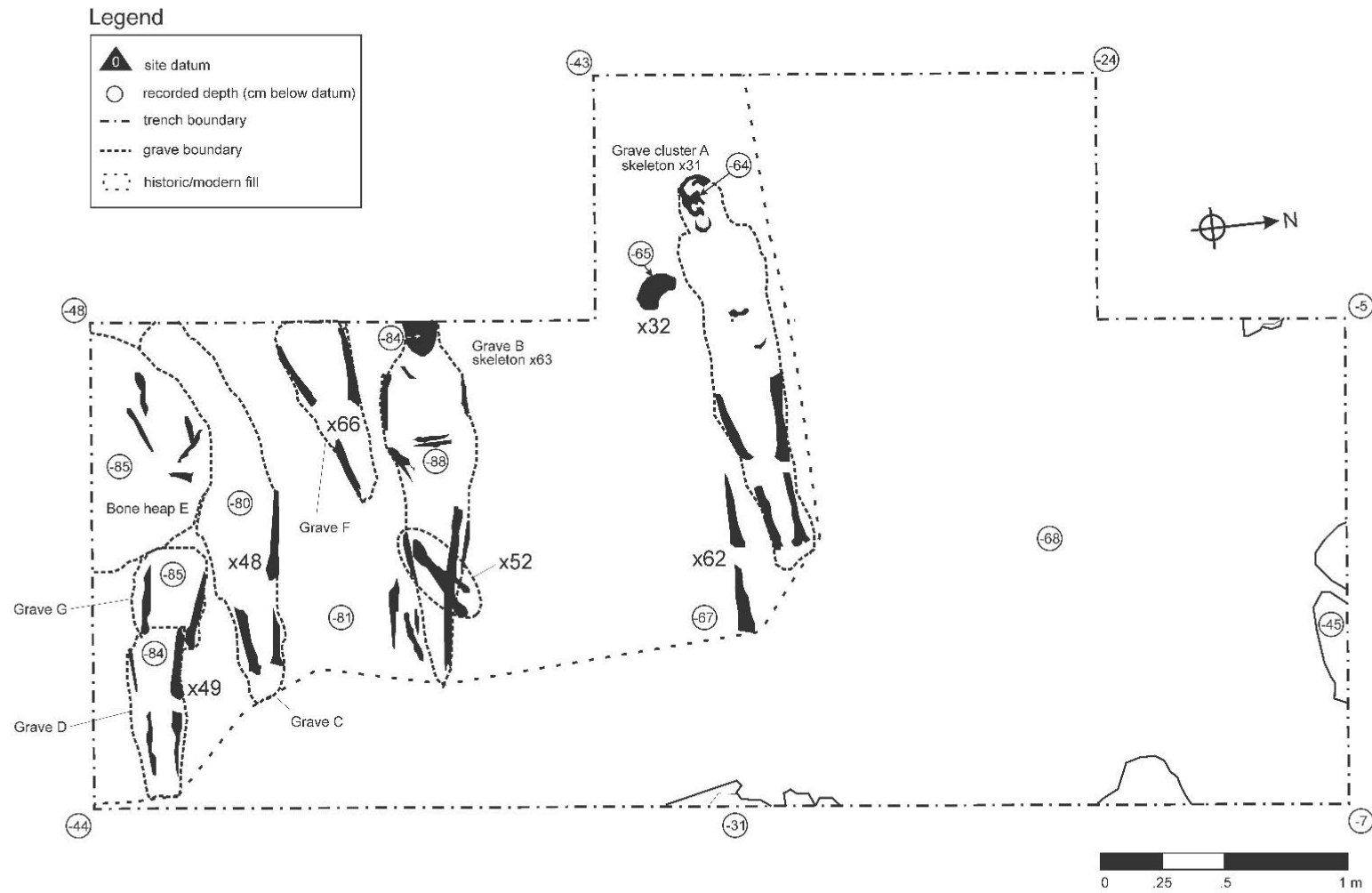


Figure 9. Legs of x31 and leg of x62.

Figure 10. Sketch of the skeletons in Test trench 1.



Skeletal remains in Test trench 1

Skeletal remains from seven ($n=7$) individuals were collected in 2019 (List of finds app. 1 drawn up in the field and Dorthe Dangvard Pedersen's list of skeletal parts drawn up in the lab. App. 4)

Grave complex A, grave A1, skeleton x31. Almost entire skeleton, apparently earlier than x32 and x62. Arm position: right arm C (perhaps B). Left arm: C. Feet cut off by modern cut.

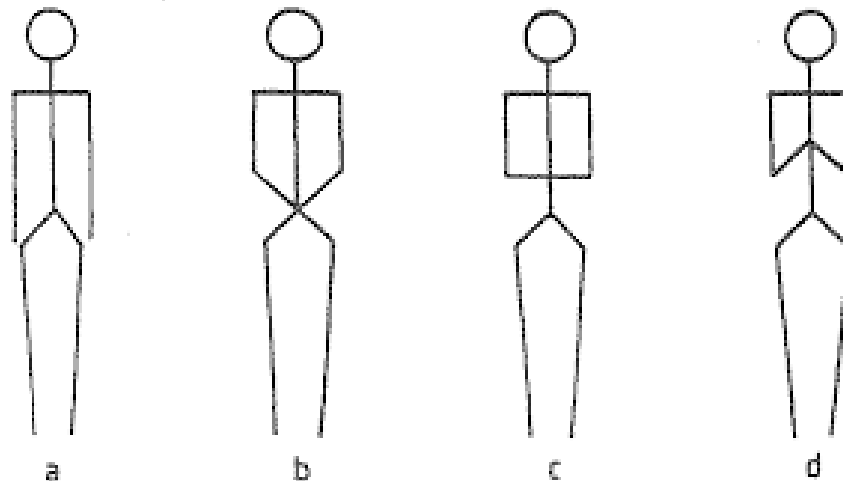


Figure 11. Dating according to arm positions

Grave complex A, grave A2, cranium x32 and post cranial parts x62. The cranium x32 and the post cranial bones most probably are from the same individual, however we could not establish any connecting bones. Apparently, there are a modern cut between grave complex A and grave complex B and the bones might have been cut on that occasion. Feet cut off by modern cut. North east of cranium x32 were two perhaps three bones from hands of x31. Arm position of x32: right arm: D, left arm B.

Grave complex B, grave B, skeleton x63. Almost entire skeleton. Below the shoulder of x63 a patella, femur and long bone (x71) appeared which must belong to an older and disturbed grave. The loose bones were recorded on plan t9 as 3 in a circle. On top of the legs of x63 were the long bones of an apparently disturbed skeleton x52. The bones were not collected.

Grave complex C, grave C, skeleton x48. The entire grave was visible; the preservation of the skeleton however was bad. The arm position is estimated to be C.

In grave complex C additional two graves were recorded - **grave D** with leg bones x49 and **grave G**, also with – very badly preserved – leg bones. Both graves were disturbed by the digging of grave C and the hole to bone heap E. The bones in grave D, G and the bone heap E were left behind.

Profiles in Test trench 1

Profile of t11 - North wall



Figure 12. The position of profile t11.

The profile of the north wall was part of the modern fill and no submerged medieval layers were identified during excavation down to approximately 60 cm below datum. The stratigraphy was relatively uncomplicated:

[00] Modern surface with loose stones originating from stone wall that had surrounded the garden.

[01] Soil of historic fill, ca. 20 cm thick.

[02] Modern cut with stones of varied sizes, charcoal, animal bones, modern window glass, heavily corroded iron fragments of nails, mounting, etc. Apparently refuse and scraps from the stone house, located at the north-eastern corner of the churchyard.

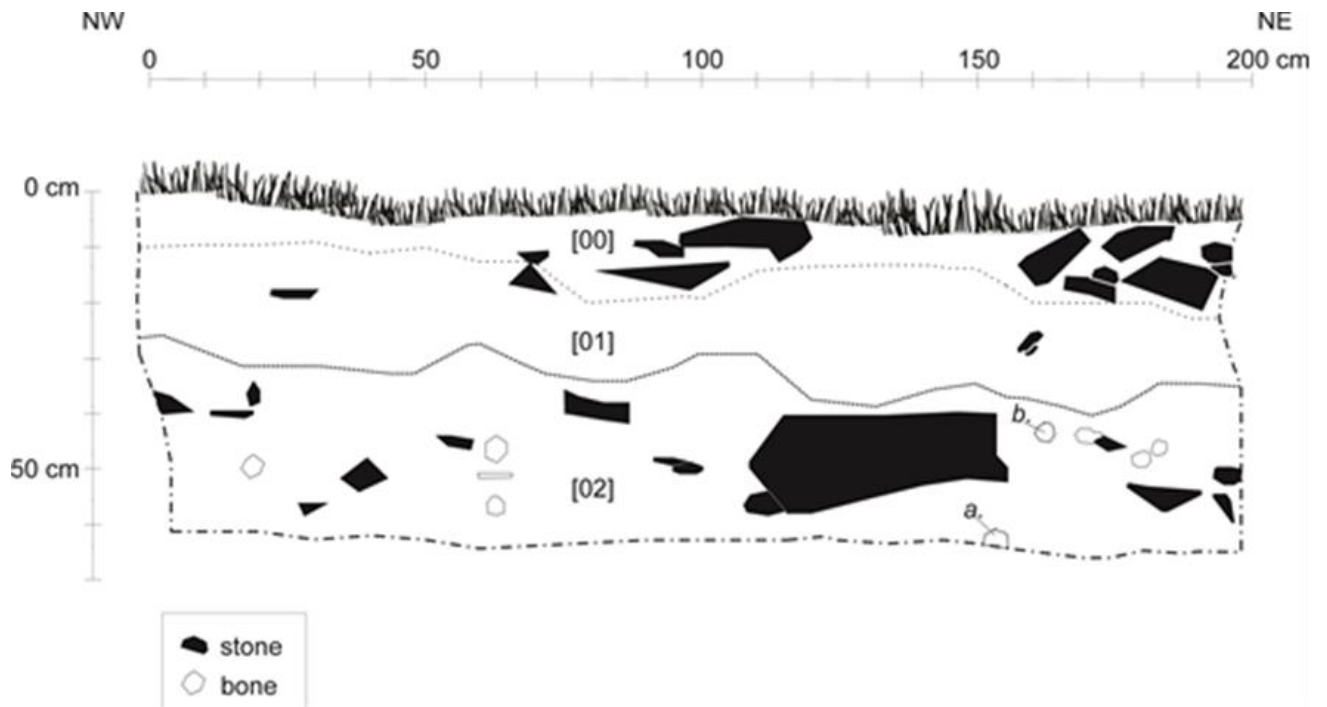


Figure 13. Trench 1, profile t11.

Profile of t11 - East wall



Figure 14. Trench 1, profile t11.

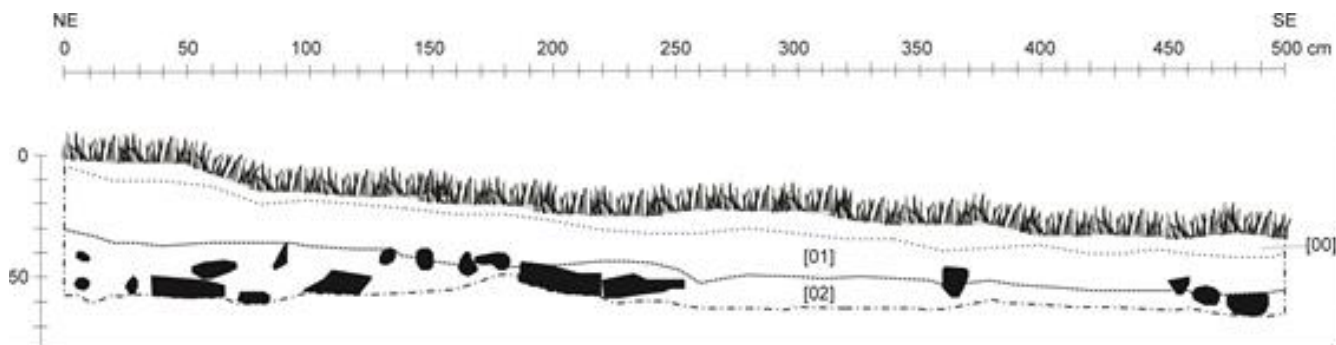


Figure 15. Profile t12 – the profile is within the modern cut and the trench was not dug to below the untouched layer.

Description (same as profile t11):

[00] Modern surface

[01] Garden soil

[02] Modern cut with stones of varied sizes, charcoal, animal bones, modern window glass, heavily corroded iron fragments of nails, mounting, etc. Apparently refuse and scraps from the stone house, located at the NE corner of the church yard.

Backfilling Test trench 1

After exhumation of the human remains, Trench 1 was backfilled on the afternoon of 19 July. A sheet of plastic was left covering Bone Heap E.

5.3. Test trench 2

The much smaller test trench (1 x 2 meter) was dug down to the north of the church. Notes by Elie Pinta:

Layer [02] [JA: must be layer below modern surface] Color: Dark brown silty sand. Top still mixed with top soil turf and get more compact. A lots of roots/rocks/charcoal.

Finds: Bones of animals, glass, pottery ceramics. Modern.

We decided to try to find a cultural layer that would have belonged to the Norse period (burials) but couldn't find anything else than modern artefacts. We decided to test only one corner and try to reach sterile/natural soil (N-E corner).

The very homogenous dark brown silty sand layer containing modern artifacts seems to end around 47 cm below top soil (N-E corner). There is a very thin black layer (landnam?) which is followed by sterile gravely/silty sand soil.



Figure 16. Elie Pinta "watering" Test trench 2.



Figure 17. Random sample of modern finds from Test trench 2: glass bottles, white porcelain/fajancefaience cup, a piece of red plastic and animal bones. The finds were not collected.

Back filling test trench 2

The trench was backfilled, and all original turf replaced on July 12.

Appendix A: artefacts

All finds are located at the Anthropological Laboratory, Department of Forensic Medicine, Copenhagen University (November 2019). Fragments of human bones that were not collected were reburied in the north-western corner of the trench.

KNK 4201x-nr	Name	Provenance	Plan #	Level - read. Fix: 145	Level - cm from surface	Comments
1	Rim of soapstone vessel	Modern cut				
2	Teeth	Grave B				
3	Bag missing	Section A4	t2a	215		
4	Charcoal	Section A4	t2b	221		
5	Charcoal	Section A4	t2b	227		
6	Unknown fragment	Section B4		218		
7	Burnt bone	Section B4		218		
8	Wood	Section A2		218		
9	Charcoal		t2b			
10	Charcoal	Grave A				
11	Burnt bone	Section B4		218		
12	Mica	Section B4		218		
13	Teeth	Section B2		216		
14	Teeth	Section B2		217		
15	Charcoal	Section A4	t2b	224		
16	Charcoal	Section A4	t2b	226		
17	Charcoal	Section A4	t2b	227		
18	Charcoal	Section A3	t2b	223		
19	Nail	Section B4	t2b	219		Modern
20	Charcoal	Grave A		213		
21	Burnt bone	Grave A		213		From sieve
22	Soil sample	Grave A1				Skull x31
23	Charcoal	Grave B		228		Left side of skull x63
24	Human bone	Grave B	t2b	228		Skeleton x63
25	Charcoal	Grave B	t2b	231		
26	Slag	Section B4		231		
27	Charcoal	Section A4	t2b	223		
28	Burnt bone	Section C2	t2b	211		ERROR! X28 is marked on plan t2b, section A3, level 228
29	Charcoal	Section B3		228		
30	Charcoal	Section B4		235		

Work Package 3.1: Human Experiences: health, well-being and trade-offs

31	Human bone; Entire skeleton	Grave A1	t10			x31. Badly preserved. Above grave A2?
32	Human bone; Skull	Grave A2				x32. Apparently skeleton x62?
33	Charcoal	Section A4			227	
34	Human bone	Section A4			227	
35	Animal bone, walrus	Unit 1, North				In modern fill
36	Animal bone, ear from seal	Section A3	t2b		220/222	
37	Soil sample	Grave A1				x31 upper layer
38	Soil sample	Grave A1				x31 chest, lower part
39	Charcoal	Section A4	t7		227	
40	Slag	Section A4			228	
41	Charcoal	Section A4	t7		228	
42	Teeth	Grave A2				x32
43	Human bone	Section A2				x32
44	Charcoal	Grave A1				x31
45	Charcoal	Grave D				
46	Burnt bone	Grave A1				x31
47	Burnt bone	Grave A2				x32
48	Human bone; Entire skeleton ?	Grave C	t8			Badly preserved
49	Human bone; Leg bones?	Grave D	t8			Above grave G, not collected
50	Soil sample	Grave B, x63				Pelvic area
51	Human bone	Grave C	t8			"Extra" arm above x48
52	Human bone; Legs?	Grave B	t9			Same skeleton as x66? Above skeleton x63
53	Charcoal	Bone heap E	t8		227	
54	Teeth	Grave C			220,5	x48
55	Charcoal	Grave C			220,5	x48
56	Charcoal	Grave C			232	Outside the left knee of x48
57	Charcoal	Grave C			231	Between knees of x48
58	Charcoal	Grave C			231	Between shin bones of x48
59	Charcoal	Section B4			226	
60	Charcoal	Grave B			218	x63
61	Charcoal	Grave B			228	x63
62	Human bone; Legs					Grave A2? same skeleton as x32? More bones visible when unearthed. Below grave A1?
63	Human bone; Entire skeleton	Grave B	t9			Badly preserved, below x52. Cutting (above) x66
64						
65						
66	Human bone; Long bones	Grave F				Badly preserved. Below and cut by grave B, x63

67	Soil sample					Pelvic. Grave A2, x62
68						
69						
70						
71	Human bone; Patella and femur, e		t9			Disturbed skeleton below x63 (right scapula and clavicular). Only patella taken home.
72	Soil samples - three					Pelvic. Grave A1, skeleton x31

Appendix B: plans & profiles

All original plans are kept at the Danish National Museum in Copenhagen (November 2019). Will be transferred to Greenland National Museum & Archives in Nuuk. All plans are available in digital format from both the Greenland National Museum & Archives and the Danish National Museum.

KNK 4201 t	Scale	Location	Description
1	1:10	Unit 1 - North	Interpretation: Fallen stones from removed house or later garden dyke
2a	1:10	Unit 1 - North	Below t01. Interpretation: Stones from either removed house or later garden. Corings. P1, P2. Sample x3
2b	1:10	Unit 1 - South	Same level as t02a. Coring P3. Samples x4, x5, x9, x15, x16, x17, x18, x19, x24, x25, x27, x36,
3	1:10	Unit 1 - North	Below t02a. Interpretation: still modern fill
4	1:10	Unit 2	Levels before excavating
5	1:10	Unit 2	c. 50 cm below modern surface: still modern fill
6	1:10	Unit 1 - North	Corings P1, P4, P5
7	1:10	Unit – From 3m to 5 m.	Samples x39 and x41
8	1:10	Unit 1 - South	Levels. Grave clusters C, D and heap of bones cluster E.
9	1:10	Unit 1	Grave cluster B, levels
10	1:10	Unit 1	Grave cluster A, levels
11	1:10	Unit 1 – profile	North wall
12	1:20	Unit 1 – profile	East wall
13	1:20	Unit 1	Surface levels

Appendix C: photo log

All photos are available in digital format from the Greenland National Museum & Archives and the Danish National Museum.

Photo # IMG: KNK 4201 f	Motive	Plan	Date	Comments
1	Igaliku		July5	
2	Unit 1, Bitrhe		July5	
3	Unit 1, Birthe cutting grass		July5	
4	Helena and Hans		July5	
5	Unit 1, turfing. Josh and Loyalty		July5	
6	Unit 1, turfing		July5	
7	Unit 1, turfing		July5	

Work Package 3.1: Human Experiences: health, well-being and trade-offs

8	Unit 1, turfing	July5
9	Unit 1, turfing	July5
10	Unit 1, turfing	July5
11	Unit 1, turfing	July5
12	Unit 1, turfing	July5
13	Unit 1, turfing	July5
14	Unit 1, turfing	July5
15	Unit 1, turfing	July5
16	Unit 1, turfing	July5
17	Unit 1, turfing	July5
18	Unit 1, turfing	July5
19	Unit 1, turfing	July5
20	Unit 1, turfing	July5
21	Unit 1, turfing	July5
22	Unit 1, turfing	July5
23	Unit 1, turfing	July5
24	Unit 1, turfing	July5
25	Unit 1, turfing	July5
26	Unit 1, turfing	July5
27	Unit 1, turfing	July5
28	Unit 1, turfing	July5
29	Unit 1, turfing	July5
30	Unit 1, turfing	July5
31	Unit 1, turfing, Helena, Birthe	July5
32	Unit 1, turfing	July5
33	Unit 1, turfing	July5
34	Unit 1, turfing	July5
35	Unit 1, turfing	July5
36	Unit 1, turfing	July5
37	Unit 1, turfing	July5
38	Unit 1, turfing	July5
39	Unit 1, turfing	July5
40	Unit 1, turfing	July5
44	Unit 1, North, upper layer. Hans	July6
45	Unit 1, North. Marks after stones in fill	July6
46	Unit 1, digging in garden soil. Hans, Birthe, Ramona	July6
47	Igaliku from N	July7
48	Igaliku from N	July7
49	Igaliku from N	July7
50	Igaliku fjord from N	July7
51	Igaliku from N	July7
52	Igaliku fjord from N	July7
53	Malene Egede's camping pod	July7

Work Package 3.1: Human Experiences: health, well-being and trade-offs

54	Malene Egede's camping pod		July7	
55	Igaliku by night		July7	
56	Igaliku by night		July7	
57	Igaliku by night		July7	
58	Igaliku by night		July7	
59	Grave A, Skeleton x31. Mirandi		July9	
60	Grave A, Skeleton x31. Mirandi		July9	
61	Grave C, Cranium/skeleton x48 Frederikke		July9	
62	Grave C, Cranium/skeelton x48. Frederikke		July9	
63	Unit 1, North, Hans		July9	
64	Mirandi, Birthe, Frederikke		July9	
65	Birthe, Frederikke		July9	
66	Unit 1, South, Jack, Mirandi,		July9	
67			July10	
68			July10	
69	Unit 1, North. Stones from modern house (?) From South	t2a	July10	
70	Unit 1, North. Stones from modern house (?) from South	t2a	July10	
71	Unit 1, North. Stone paving (?) from modern house	t2a	July10	
72	Unit 1, North. Stone paving from modern house (?)	t2a	July10	
73	Unit 1, North. Stone paving from modern house (?)	t2a	July10	
74	Unit 1, North	t2a	July10	
75	Helena		July10	
76	Unit 1, North. From West	t2a	July10	
77	Unit 1, North. From West	t2a	July10	
78	Unit 1, North. From West	t2a	July10	
79	Excavating		July10	
80	Excavating		July10	
81	Birthe, Mirandi		July10	
82	Frederikke		July10	
83	Unit 1, kaos		July10	
84	Unit 1, kaos		July10	
85	Unit 1, kaos		July10	
86	Loyalty		July11	
87	Unit 2, surface	t4	July11	
88	Unit 2, surface	t4	July11	
89	Unit 2, Elie		July11	
90	Loyalty		July11	
91	Mirandi, Frederikke		July11	
92	Jack		July11	

Work Package 3.1: Human Experiences: health, well-being and trade-offs

93	Jack		July11	
94	Mirandi, Frederikke		July11	
95	Loyalty		July11	
96	Unit 2, Elie		July11	
97	Loyalty		July11	
98	Unit 2. Upper layer	t5	July11	
99	Unit 2. Upper layer	t5	July11	
100	Unit 1, South	t2b	July12	
101	Unit 1, South	t2b	July12	
102	Unit 1, South	t2b	July12	
103	Unit 1, North. Modern fill	t3	July12	
104	Unit 1, North. Modern fill	t3	July12	
105	Unit 1, North. Modern fill	t3	July12	
106	Unit 1, North. Modern fill	t3	July12	
107	Avanaq & Malu, grave cluster A, x31, x62		July12	
108	Avanaq & Malu, grave cluster A, x31, x62		July12	
109			July12	
110			July12	
111	Grave cluster A, x31, x62		July12	
112	Grave cluster A, x31, x62		July12	
113	Grave cluster A, x31, x62		July12	
114	Grave cluster A, x31, x 62, Malu		July12	
115	Grave cluster A, x31, x 62, Malu		July12	
116	Grave cluster A, x31, x 62, Malu		July12	
117	Malu		July12	
118	Hans, Jette		July12	
119	Hans		July12	
120	Jette, Avaraaq, Hans		July12	
121	Hans		July12	
122	Avaraaq, Malu		July12	
123	Avaraaq, Malu		July12	
124	Avaraaq, Malu		July12	
125	Avaraaq		July12	
126	Avaraaq		July12	
127	Avaraaq		July12	
128	Avaraaq		July12	
129	Avaraaq		July12	
130	Avaraaq		July12	
131	Hans		July12	
132			July14	
133			July14	
134			July14	
135			July14	
136			July14	

Work Package 3.1: Human Experiences: health, well-being and trade-offs

137			July14	
138			July14	
139			July14	
140			July14	
141			July14	
142			July14	
143			July14	
144			July14	
145			July14	
146			July14	
147			July14	
148			July14	
149			July14	
150			July14	
151			July14	
152	Unit 2, modern finds		July14	The finds were not collected
153	Unit 2, modern finds		July14	The finds were not collected
154	Grave cluster B, Mirandi, Josh		July14	
155	Grave B		July15	
156	Grave cluster A, x31, x62		July15	
157	Grave cluster A, x31, x62, Frederikke		July16	
158	Grave cluster A, x31, x32, x62		July16	
159	Grave cluster A, x31, x32, x62		July16	
160	Grave cluster A, x31, x32, x62		July16	
161	Grave		July16	
162	Excavating		July16	
163	Frederikke		July16	
164	Excavating		July16	
165	Unit 1, south. x51 between legs of x66 and x48, apparantly above x48's right arm		July16	
166	Unit 1, south. x51 between legs of x66 and x48, apparantly above x48's right arm		July16	
167	Grave F, x66		July16	
168	Grave F, x66		July16	
169	Unit 1, south		July16	
170	Hans		July16	
171	Hans		July16	
172	Grave cluster A		July16	
173	Unit 1, south		July16	
174	Grave C, Skeleton x48		July17	
175	Unit 1, south		July17	

Work Package 3.1: Human Experiences: health, well-being and trade-offs

176	Grave B, x63 & grave F, x66		July17	
177	Grave cluster A, skull x32		July17	
178	Grave cluster A, skeleton x31, skull x32, legs x62		July17	
179			July17	
180	Legs x52		July17	
181	Grave C, legs x48 & grave D, legs x49, labels for geo ref		July17	
182	Unit 1, south + geo ref labels		July17	
183	Unit 1, south + geo ref labels		July17	
184	Unit 1, south + geo ref labels		July17	
185	Grave B, x63, + Geo ref labels		July17	
186	Grave B, x63 + Geo ref labels		July17	
187	Grave cluster A, skeleton x31, skull x32 + geo ref labels		July17	
188	Grave cluster A, skeleton x31, legs x62 + geo ref labels		July17	
189	Grave cluster A, skeleton x31, legs x62 + geo ref labels		July17	
190	Grave cluster A, skeleton x31, skull x32, legs x62 + geo ref labels		July17	
191	Drone		July17	
192	Drone		July17	
193	Drone		July17	
194	Drone		July17	
195	The team		July18	
196	The team		July18	
197	The team		July18	
198	The team		July18	
199	The team		July18	
200	The team		July18	
201	The team		July18	
202	The team		July18	
203	The team		July18	
204	Igaliku fjord from N		July18	
205	Igaliku from N		July18	
206	Igaliku from N		July18	
207	Igaliku from N		July18	
208	Unit 1, Grave cluster A, skeleton x31, cranium x32, skeleton x62		July19	
209	Unit 1, Grave cluster A, skeleton x31, cranium x32, skeleton x62		July19	
210	Grave cluster A, x31, x32, x62		July19	

Work Package 3.1: Human Experiences: health, well-being and trade-offs

211	Grave cluster A, x31, x32, x62		July19	
212	Grave cluster A, x31, x62		July19	
213	Grave cluster A, x31, x32		July19	
214	Grave cluster A, x31, x32		July19	
215	Unit 1 North, modern fill	t11	July19	
216	Unit 1 North, modern fill	t11	July19	
217	Grave cluster A, x31, x32. Konrad taking up skeletons		July19	
218	Grave cluster A, x31, x32. Konrad taking up skeletons		July19	
219	Grave cluster A, x32, x62		July19	
220	Grave cluster A, x32, x62		July19	
221	Grave cluster A, x32, x62		July19	
222	Grave cluster A, x31, x32		July19	
223	Frederikke		July19	
224	Frederikke		July19	
225	Bones		July19	
226	Bones		July19	
227	Bones		July19	
228	Bones		July19	
229	Bones		July19	
230	Ramona, Gunnar		July19	
231	Bones		July19	
232	Unit 1, North profile, Josh, Hans, Helena		July19	
233	Recording, Helena	t11	July19	
234	Recording, Helena	t11	July19	
235	Birthe		July19	
236	Birthe		July19	
237	Birthe		July19	
238	Birthe		July19	
239	Birthe		July19	
240	Recording, Helena	t11	July19	
241	Recording, Helana, Josh	t11	July19	
242	Excavating		July19	
243	Recording Helana, Josh	t11	July19	
244	Excavating		July19	
245	Excavating		July19	
246	Konrad		July19	
247	Konrad		July19	
248	Mirandi		July19	
249	Bones, James, Konrad, Ramona, Laura		July19	
250			July19	
251	Excavating		July19	
252	Working tent		July19	

Work Package 3.1: Human Experiences: health, well-being and trade-offs

253	Frederikke, Mirandi		July19	
254	Frederikke, Mirandi		July19	
255	James		July19	
256	Ramona		July19	
257	Ramona		July19	
258	Ramona, Kaylee		July19	
259	Hans, Josh		July19	
260	Hans		July19	
261	Bones		July19	
262	Konrad, Mirandi		July19	
263	Konrad, Mirandi		July19	
264	Konrad, Mirandi		July19	
265	Mirandi		July19	
266	James, Laura		July19	
267	Konrad, Mirandi		July19	
268	Bones		July19	
269	Bones		July19	
270	Bones		July19	
271	Mirandi		July19	
272	Packing bones		July19	
273	Packing bones		July19	
274	Ramona		July19	
275	Ramona, Mirandi, Laura		July19	
276			July19	
277	Josh, Hans, Helena		July19	
278	Laura		July19	
279	Ramona		July19	
280	James		July19	
281	Packing bones		July19	
282	Packing bones		July19	
283	Frederikke		July19	
284	Packing bones		July19	
285	Laura, Frederikke, Mirandi, James, Kaylee		July19	
286	Mirandi		July19	
287	Mirandi		July19	
288	Konrad		July19	
289	Packing bones, Laura, James, Kaylee		July19	
290	Taking up bones		July19	
291	Taking up bones		July19	
292	Taking up bones, Laura		July19	
293	Taking up bones, Frederikke, Mirandi		July19	
294	Taking up bones, Laura		July19	
295	Taking up bones, Laura		July19	

296	Taking up bones		July19	
297	Taking up bones		July19	
298	Taking up bones, Frederikke, Mirandi, Laura		July19	
299	Taking up bones, Laura		July19	
300	Packing bones, James		July19	
301	Packing bones, Mirandi		July19	
302	Taking up bones, Laura		July19	
303	Taking up bones, Laura		July19	
304	Taking up bones, Laura		July19	
305	Taking up bones, Laura		July19	
306	Taking up bones, Frederikke		July19	
307	Frederikke		July19	
308	Laura		July19	
309	Laura		July19	
310	Laura		July19	
311	Halena		July19	
312	Packing bones		July19	
313	Grave cluster A, x31 right arm position D		July19	
314	Grave cluster A, x31 right arm position D		July19	
315	Grave cluster A, x31 right arm position D		July19	
316	Grave cluster A, x31 right arm position D		July19	
317	Grave cluster A, x31 left arm in position B		July19	
318	Grave cluster A, x31 left arm in position B		July19	
319	Grave cluster A, x31 left arm in position B		July19	

Appendix D: collected human bones

By Dorthe Dangvard Pedersen (DDP)

Description from the field by Frederikke Reimer and Konrad Smiarowski - DDP additions in red.

Grave complex A (grave A1)

X31	<p>Almost entire skeleton. Right arm: arm position D (or C) Left arm: arm position B Left humerus Right humerus Right radius + Fibula Left tibia Left femur Left radius + ulna Hands/forearms (?) Bones of right foot Left metacarpas + phalanges Three (3) pelvic soil samples (x72) Right femur Skull</p>	
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Grave complex A (grave A2)

X32	cranium above x31. Skull	May belong to x62
X62	Partly and badly preserved skeleton. Below x31. Left femur Left tibia Pelvis + pelvic soil Pelvic soil sample (x67)	May belong to the skull x32
	Tubular bone east of x32	

Grave complex B (grave B)

X63	Partly and badly preserved skeleton Right humerus Right radius + ulna Left patella Left clavicle Right scapula + clavicle Left radius + ulna Right tibia + fibula Left tibia + fibula Skull Right femur Left humerus Left femur	
X63	Extra bone, fibula Extra bone, tibia Extra bone, fibula	X52?
X71	Patella and femur , skeleton below x63 Patella and femur below x63 (right scapula and clavicular). Only patella taken home. Femur below x63 cranium taken home	Not on plan

Grave complex C (grave C)

X48	Left femur Right tibia Left ulna + radius + humerus Left tibia Left side of pelvis Skull	
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Grave complex C (grave D & grave G)

X49	Leg bones Leg bones from grave G	Not collected Not collected
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Grave complex F (grave F)

X66	Three long bones	
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Heap of bones E

Bones not collected

SKELETAL REPORT

SITE NAME IGALIKU/GADAR 047 MUSEUM NR KNK4201

Grave nr.: A1, X31

AS nr: 29/2019

Analysed by: DDP

date 22/11-19

Preservation and completeness: UPPER BODY POORLY PRESERVED, LOWER BODY WELL PRESERVED

Femur length: R ✓ L ✓ Caput fem. Diam. ✓

Stature (calculated): ✓ Method _____

Sex: MALE

Skull: 5

Pelvis: ✓

Other elements: 5

Age: 44-56

Pubic symphysis:

Auricular surface:

Ribs:

Tooth wear:

Sutures:

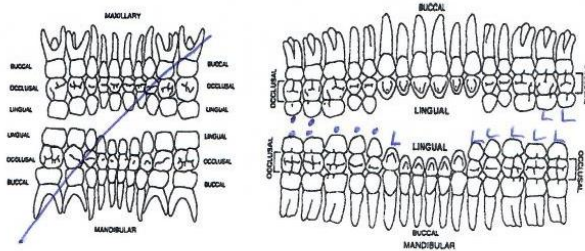
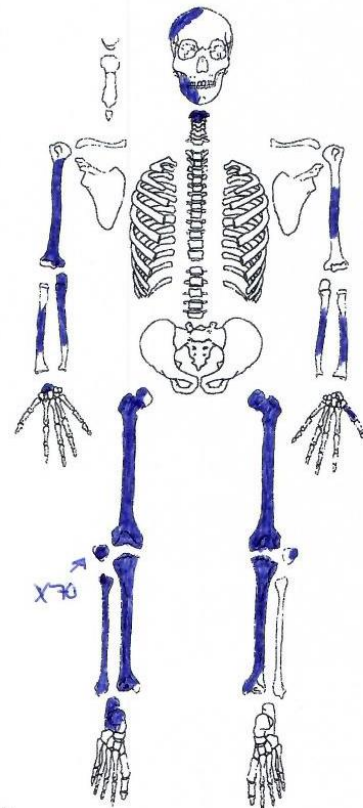
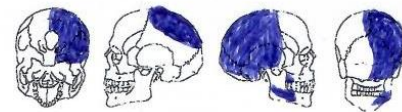
Other elements:

Pathology/other:

CRIBRA CRANI

TORI MANDIBULARIS + PALATINI

MILD REMODELLED PERIOSTITIS TIBIAE MIDSHAFTS



Teeth:

- Present
 - u Lost post mortem
 - x Lost intra vitam
 - e erupting
 - Q not erupted
 - a agensis
 - s supernumerary
 - r retained
- Caries, calculus and EH are sketched in.
L LOOSE TOOTH WITHOUT JAW

SKELETAL REPORT

SITE NAME IGALIKU/GARDAR 047 MUSEUM NR KMK 4201

Grave nr.: A2, X62 + X32

AS nr: 29/2019

Analysed by: DDP

date 22/11-19

Preservation and completeness: POOR PRESERVATION

Femur length: R ✓ L ✓ Caput fem. Diam. ✓

Stature (calculated): ✓ Method _____

Sex: FEMALE

Skull: ✓

Pelvis: ✓

Other elements: 1

Age: 16-18

Pubic symphysis:

Auricular surface:

Ribs:

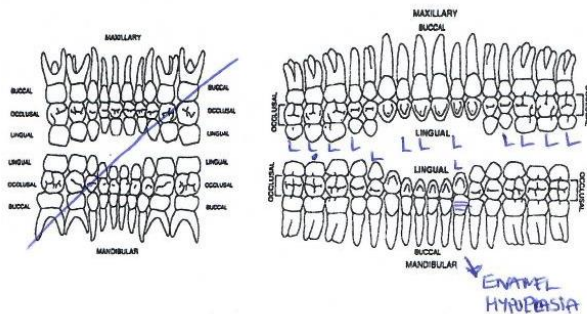
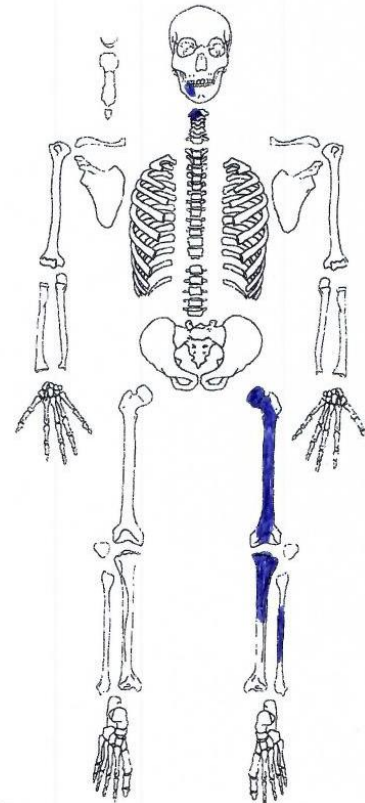
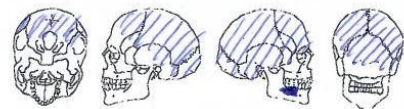
Tooth wear:

Sutures:

Other elements:

Pathology/other:

ENAMEL HYPOPLASIA
CALCULUS



Teeth:

- Present
- u Lost post mortem
- x Lost intra vitam
- e erupting
- 0 not erupted
- a agensis
- s supernumerary
- r retained

Caries, calculus and EH are sketched in.

L LOOSE TOOTH WITHOUT JAW

SKELETAL REPORT

SITE NAME IGALKU/GARDAR 047 MUSEUM NR KNK 4201

Grave nr.: B, x63

AS nr: 29/2019

Analysed by: DDP

date 22/11-19

Preservation and completeness: POOR PRESERVATION

Femur length: R ✓ L ✓ Caput fem. Diam. ✓

Stature (calculated): ✓ Method _____

Sex: MALE

Skull: 5

Pelvis: ✓

Other elements: 5

Age: 40-50

Pubic symphysis:

Auricular surface:

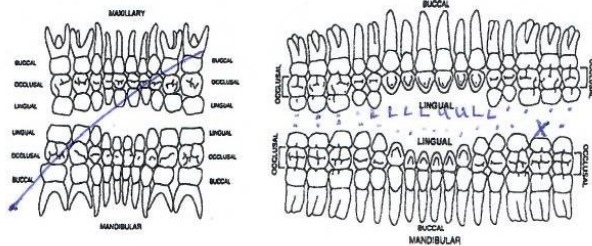
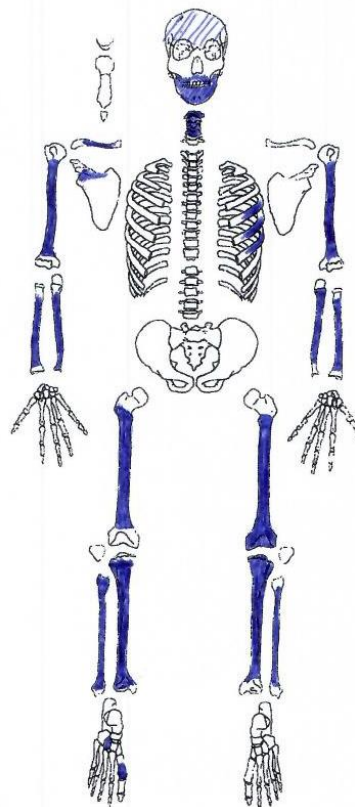
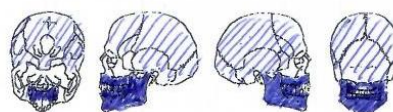
Ribs:

Tooth wear:

Sutures:

Other elements:

Pathology/other:



Teeth:

- Present
- u Lost post mortem
- x Lost intra vitam
- e erupting
- 0 not erupted
- a agenesia
- s supernumerary
- r retained

Caries, calculus and EH are sketched in...
L LOOSE TOOTH WITHOUT JAW

SKELETAL REPORT

SITE NAME IGALIKU/GARDAR 047 MUSEUM NR KNK 4201

Grave nr.: C, X48

AS nr: 29/2019

Analysed by: DPF

date 22/11-19

Preservation and completeness: POOR PRESERVATION

Femur length: R ✓ L ✓ Caput fem. Diam. ✓

Stature (calculated): ✓ Method _____

Sex: FEMALE

Skull: 3

Pelvis: ✓

Other elements: 2

Age: 45-60

Pubic symphysis:

Auricular surface:

Ribs:

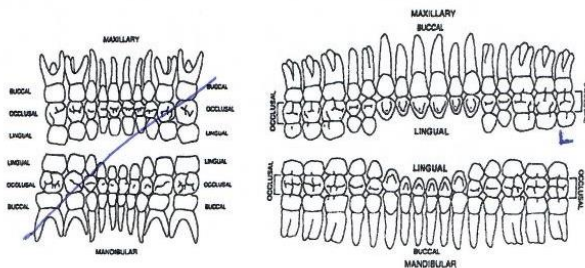
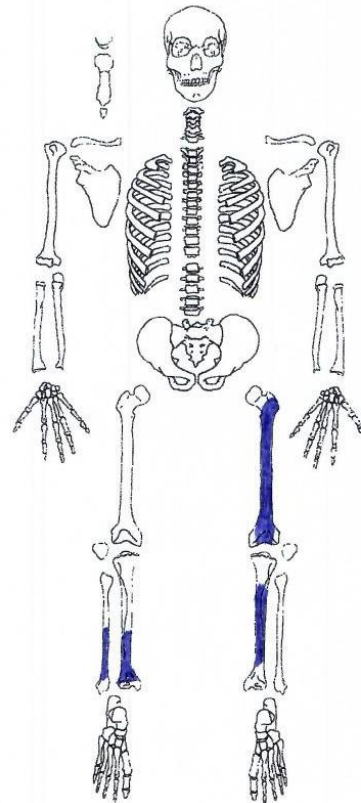
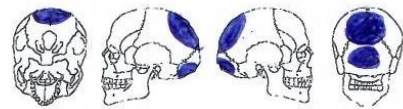
Tooth wear:

Sutures:

Other elements:

Pathology/other:

REMODELLED PERIOSTITIS RIGHT TIBIA



Teeth:

- Present
- u Lost post mortem
- x Lost intra vitam
- e erupting
- 0 not erupted
- a agensis
- s supernumerary
- r retained

Caries, calculus and EH are sketched in.

L LOOSE TOOTH WITHOUT JAW

SKELETAL REPORT

SITE NAME IGALIKU/GARDAR 047 MUSEUM NR KMK 4201

Grave nr.: F, X66

AS nr: 29/2019

Analysed by: DDP

date 22/11-19

Preservation and completeness: POOR PRESERVATION

Femur length: R ✓ L ✓ Caput fem. Diam. ✓

Stature (calculated): ✓ Method _____

Sex: MALE ?

Skull: ✓

Pelvis: ✓

Other elements: 4

Age: 38-52

Pubic symphysis:

Auricular surface:

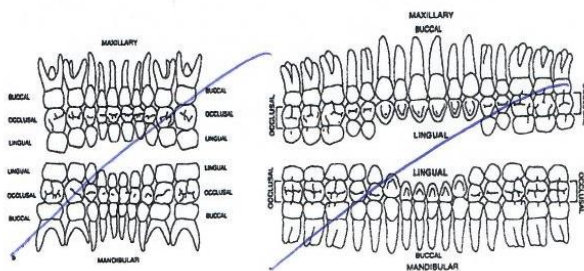
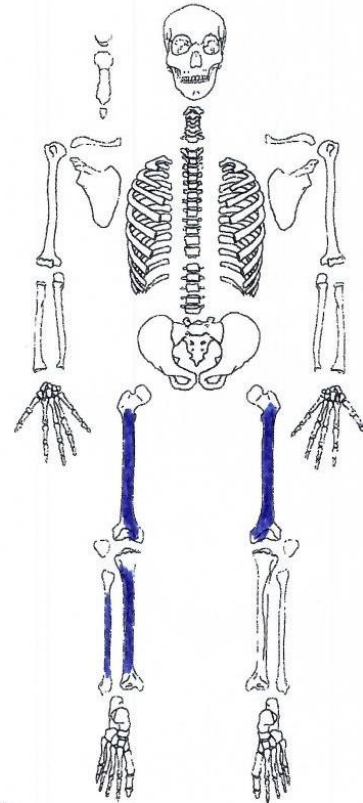
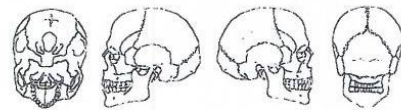
Ribs:

Tooth wear:

Sutures:

Other elements:

Pathology/other:



Teeth:

- Present
 - u Lost post mortem
 - x Lost intra vitam
 - e erupting
 - 0 not erupted
 - a agensis
 - s supernumerary
 - r retained
- Caries, calculus and EH are sketched in.