Sex and Gender in the Mesolithic: Adults and Children from the Strøby Egede Burial, Køge Bugt, Denmark

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APPENDIX S.1: SKELETAL AND DENTAL ANALYSES FOR STRØBY EGEDE

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This document adds detail and context to the skeletal summary in the primary paper, which focuses on the analysis that centres the paper. Besides briefly summarising aspects of the information published immediately after discovery of the burial, the data below are largely unpublished other than in brief summary form. As in the main text data below are organised by individual and in the same order.

The data presented below were collected at various times. Initial work was by one of us (VA) and J. Balslev Jørgensen, working with Erik Brinch Petersen, during and shortly after the 1986 excavation. CM initially saw the burial *in situ* but did not work on it at the time. The differing completeness of the data below relates to the early handling of the burial, as noted in the main paper. Further work was done by CM at Køge Museum in 1992, after the material was on display. The dental analysis below is primarily based on a 1997 document by VA, revised later by CM. Finally, VA made further modifications during writing of this paper, based primarily on new images of the dental series.

The descriptions below use symbols or code to present the core data, primarily in the dental charts and in the summaries of bones present and degree of completeness, as outlined below.

The dental charts used provide two types of information, teeth recovered and their condition. The charts present the dentition as viewed in frontal or facial view with sides reversed in the chart (R and L as shown in cells at each end):

Right side	Teeth in sequence	Upper	Teeth in sequence	Left side
	Teeth in sequence	Lower	Teeth in sequence	

The teeth are identified by type and number, following anthropological practice, identified by letter, rather than the dental number system (1–8). Permanent teeth are identified by capital letters (I=incisor, C=canine, P=premolar, M=molar) and number (eg, M1, M2, M3 for molars). Premolars are identified as P1 and P2, based on position only, rather than P3 and P4, based on mammalian homology. Deciduous (milk) teeth are identified by small letters and the prefix d (di=incisor, dc=canine, dm=molar). The charts are further organised in two levels for both upper and lower dentitions, with central levels identifying teeth present, outer levels giving status of the tooth, and/or dental socket.

The number of cells shown per side is a function of whether teeth are permanent or deciduous, eight per side for the former and five for the latter. In mixed dentitions, as for Strøby Egede B, then the number per level and side may vary.

The central levels of the charts identify tooth presence as noted above (eg, M1 for first permanent molar, dm1 for first deciduous molar). Where teeth were absent, either *in situ* in the socket, or loose in the deposit, then both the cell and socket identification are in grey shade.

The outer levels of the chart provide further identification on dental status, as follows:

+ = intact *in situ* when discovered
u = missing when discovered (not recovered later) (=lost postmortem)
x = present but recovered loose in the matrix
d = damaged post-mortem

For the bone lists in the text only those present are listed including those of the cranium. Those that are bilateral are identified as right/left (eg, i/d), with five condition levels, intact (i), damaged (d), fragmentary (f), very fragmentary (ff) and not present only used in bilateral bones with one side present. Condition level symbols follow Newell *et al*. (1979, 23):

intact = i (not damaged; all measurements possible)
damaged = d (largely complete; some measurements not possible)
fragmentary = f (parts missing but some reconstruction and measurements possible)
very fragmentary = ff (not reconstructable; few if any measurements possible)
not present = - (only used for bilateral pairs; eg, -/d)

Bones listed and condition were as identified during examination of the *in situ* burial at Køge Museum in 1992. Bones not listed may simply have been obscured in the displayed burial. Both the inventory and full condition list must therefore be understood as incomplete.

The burials
The descriptions are by burial, as numbered in 1986. The sources referenced below are at the end of the main text and may overlap those in the main paper. Tables are found after the bibliography.

Strøby Egede A
The only adult in the southern group and most complete individual other than Strøby Egede D, with both skull and postcranial skeleton largely complete.

Sex: Initial assessment as female was based on dental and morphological features, especially of the skull (Brinch Petersen 1990). This agrees with the 1992 assessment, though the fragmentary to very fragmentary pelvis (f/ff) prevented full evaluation. The dental wear pattern did not allow for a sex assessment with any certainty. Heavy anterior and lower posterior wear is characteristic of Late Mesolithic women in Scandinavia, with moderate anterior, as opposed to posterior, wear found in males.

Age: The initial assessment was as middle aged, *c*. 50-years old (Brinch Petersen 1990). A similar age was suggested in 1992. A fuller assessment gives overlapping estimates based on dentition, ectocranial suture closure and general health and pathology, with a revised figure of *c.* 40 years and a possible range of 35–50.

For the dentition the anterior teeth, premolars and M1 show heavy attrition, but M2 and M3 wear is moderate bilaterally. The Miles method for molar attrition (Miles 1963; 2001) gives an an estimate of 30–40 at time of death, though heavy anterior tooth wear is more consistent with a 40–50 year old, almost certainly related to use of the teeth as a tool, possibly for preparation of hides. The sum of these factors produces the estimates above.

The above is consistent with assessments from both ectocranial suture closure and health assessment. Suture closure, following Meindl and Lovejoy (1985; see Table S1.1), gives a combined evaluation from nine closure sites of 35–45 years, with individual site ranges from 40–45 years. Given the standard error values, a full age range is 35–50 years. Health and age-related markers are consistent with

the above, including minimal cranial but general postcranial arthritis and only moderate changes to thoracic and lumbar vertebrae. Nathan's (1962) four-point system for vertebral arthritis reached level two in the thoracic and level three in the lumbar region. Cervical assessment was not possible.

Stature: Based on length measurements for left humerus, femur and tibia (Table S1.2), estimates from the humerus were *c.* 5 cm taller than for femur and tibia using Trotter and Gleser (1952) equations for Europeans. The average value was *c.* 152 cm (rounded) with a range of *c.* 146–160 cm. Equations for metatarsals (Byers *et al.* 1989) gave results that were 10–15 cm taller but lack independent corroboration. The long bone results are consistent with diagnosis as female and similar to Bøgebakken females HB20 and HB22.

Pathology and other features: The thick cranial vault reached 10 mm in places, a condition noted in other Danish Mesolithic samples, including Bøgebakken. It does not appear to be hyperostosis, linked to nutritional stress and factors including iron deficiency (Meiklejohn & Zvelebil 1991; Meiklejohn *et al.* 1998), but may suggest tapeworm infestation, associated with eating raw and/or undercooked fish.

The age may explain lack of periodontal disease except between right 2nd and 3rd upper molar. Upper anterior tooth wear was much heavier than in the molars, with secondary dentine exposed on left lateral incisor with the crown completely lost to wear, and in secondary dentine exposure on both upper canines.

Cranial analysis: Largely complete skull; all parts apparently present, though with preservation issues. The only missing bones are the left occipital condyle and left malar. Primary damage is to the right frontal and adjacent sphenoid and lateral portions of both sides of the face; both maxillae are fragmentary.

Of observations made at time of description, apart from cranial vault thickness, it appears that reconstruction of the cranium over-emphasises prognathism. Cranial measurements are in Table S1.3; basion was damaged and left asterion hard to establish, while cranial breadth measurements (WFB, XFB) were obtained by doubling estimated values for the left side.

Cranial inventory: frontal (f/d), parietals (f/d), temporals (f/d), mastoids (i/i), occipital (d/d), occipital condyles (d/-), sphenoid (f/f), ethmoid (ff/ff), orbits (ff/ff), nasals (d/d), malars (d/-), maxillae (f/f), mandibular body (i/i), mandibular rami (i/i).

Postcranial analysis: Almost all bones appear to be present, though current display makes identification and status problematic, especially for the left side, the ribs and both hands and feet. The metacarpals and cervical vertebrae could not be assessed.

Postcranial inventory: Clavicles (i/d), scapulae (ff/?), humeri (ff/f?), radii (ff?/i?), ulnae (ff?/i?), innominates (ff/f), femora (ff/f), patellae (?/i?), tibiae (d/?), fibulae (d/?), ribs (9+/9+; d-f/d-ff), hand phalanges (?/3+; -/i?), carpals (?/2+; ?/i?), foot phalanges (5+/1+; i?/i), metatarsals (3+/5; i-d/i-?), tarsals (5+/4+; i/i-?), cervical vertebrae (?/?), thoracic vertebrae (12/i-ff), lumbar vertebrae (5/i), sacrum (d?), sternum (f?), manubrium (ff).

Dental analysis: Damage appears to have followed the initial discovery. The woman probably used her anterior teeth to soften hides (see also above), similar to wear seen at Skateholm (Alexandersen 1988), though not all older women show the pattern. The older woman at Dragsholm (grave B) had similar wear on anterior and posterior teeth. Teeth present and status follows (for condition symbols see above):

R	d	+	+	+	+	d	d	d		d	d	+	+	+	+	+	+	L
	M3	M2	M1	P2	P1	C	I2	I1	+	I1	I2	C	P1	P2	M1	M2	M3	
	M3	M2	M1	P2	P1	C	I2	I1	-	I1	I2	C	P1	P2	M1	M2	M3	
	u	u	d	d	d	d	d	d		d	d	d	+	+	+	+	+	

Dentin inside the crowns was partially dissolved. The teeth were fragile and were stabilised during the excavation using lacquer. Further damage occurred while loosening the maxilla from the mandible. Attrition was heavy in anterior incisors through 1st molars, but more moderate on 2nd and 3rd molars. Maxillary anterior teeth were worn to the point where the crowns were completely lost and root surfaces reduced to smooth rounded chewing surfaces, especially obvious on the facial aspect of the teeth. Secondary dentin was visible on the canines. The mandibular anterior teeth were not similarly worn, with about one quarter of crown height remaining. This, commonly the case, results from incipient overbite at initial dental eruption resulting in sharpness of lower teeth and faster maxillary wear. Enamel on the occlusal surfaces of maxillary first premolars was totally lost, with little left on 2nd premolars. Mandibular molar wear was greater than in the maxillary arch. There was little 3rd molar attrition and no left/right asymmetry. The wear pattern was helicoidal.

Few intact enamel surfaces remain; those present show neither structural changes nor pathology. No generalised marginal bone loss was seen but calculus was collected around the right maxillary molars, and heavy bilateral calculus was found between mandibular I2 and PM1. The lower border of the calculus was located at the cemento-enamel junction (CEJ), indicating lack of alveolar resorption. Osseous portions of the tempero-mandibular joints (TMJ) showed remodelling but no pathology. Mandibular condyles were enlarged and articular tubercles flattened. There was a fairly large palatine torus but no mandibular torus. Small alveolar exostoses were found facially to the maxillary right molars and lingually to both right and left maxillary molars.

Strøby Egede B

The only older child, from the southern group, including a partial skull, mandible, and largely complete postcranial skeleton.

Sex: Initial sex assessment as female was based on associated grave-goods (Brinch Petersen 1988), now supported by dental etching.

Age: Initially identified as 9–10 years old, the dental eruption pattern and long bone length indicate a slightly younger age of 7–8 years. The mandible has left dm1 and dm2 in place, with M1 erupted and with initial cusp blunting. M2 is in its crypt, consisting of mineralised tooth crowns. I2 is erupting and both left maxillary premolars, unerupted, show initial root formation only. The pattern fits Hillson's (1996) stages 11 and 12. The range, 7 years±9 months to 8 years±9 months, was confirmed by VA during preparation of this paper. Four long bone lengths (see Table S1.4), provided estimates of 7 years, 3 months from humerus and femur, and 8 years from ulna and radius based on Facchini and Veschi (2004).

Stature: Too young to permit stature estimation.

Pathology and other features: As with Strøby Egede C, observations were limited. No arthritis was observed, as expected. Two cranial features have not been diagnosed. A minor depression with circular rim, *c.* 25 × 20 mm, is present in the upper central quadrant of the left parietal. As well there are two artificial grooves on the right frontal above the orbit. Both features are not apparent cut marks but may be root marks.

Cranial analysis: The majority of the vault and left posterior of the base are present, but only the malars and nasal processes of the maxillae from the face were found. The mandible is present. Missing are sphenoid, ethmoid, both palatines and both nasals, plus the anterior and much of the base of the right temporal. At time of study the mandibles of individuals B and C were reversed in the display.

Cranial inventory: Frontal (d/d), parietals (d/d), temporals (f/d), mastoids (f/d), occipital (f/d), occipital condyles (-/d), orbits (d-f/d-f), malars (i-d/i-d), maxillae (ff/ff), mandibular body (d/d), mandibular rami (d/d).

Postcranial analysis: Though most bones and regions are present, identification and status is problematic, especially for the right hand. Neither sternum nor left carpals could be identified or assessed.

Postcranial inventory: Clavicles (d/ff), scapulae (ff/ff), humeri (f/ff), radii (f/f), ulnae (i/ff), innominates (ff/f), femora (i?/f), patellae (-/d?), tibiae (f?/i?), fibulae (ff/d?), ribs (+/+; ff/ff), hand phalanges (-/10?; -/i-ff), metacarpals (-/2; -/i), foot phalanges (6?/4; d-ff/d-f), metatarsals (?/?), tarsals (3+ - side?; d), cervical vertebrae (7/d-f), thoracic vertebrae (10+/d?), lumbar vertebrae (5/d?), sacrum (f).

Dental analysis (see also under age, above): Occlusal enamel on erupted molars was polished while deciduous molars were worn with considerable dentin exposure, especially on dm1. All M1s were erupted and with enamel polish; one had a clear wear facet. Linear enamel hypoplasia (LEH) was only present on the left mandibular canine. Tooth size was moderate (see Tables S1.5 and S1.6) and tooth crowns showed several crown number reductions. Mandibular M1s had four rather than the usual five cusps. The maxillary M1 showed four cusps but no Carabelli's cusp, while M2 showed three cusps. In the grave, right maxilla was intact, with first permanent and deciduous molars erupted and *in situ*. The left maxillary premolars were found *in situ*, with other maxillary teeth loose in the matrix. All mandibular teeth were recovered as loose teeth.

R	+	+	+	+	+	u	u		u	u	u	+	+	x	x	L
	M2	M1	dm2	dm1	C	I2	I1	+	I1	I2	C	PM1	PM2	M1	M2	
	M2	M1	dm2	dm1	C	I2	I1	-	I1	I2	C	dm1	dm2	M1	M2	
	x	x	u	u	u	u	x		x	x	x	x	x	x	x	

Strøby Egede C
The only adolescent and from the southern group, represented by a partial vault and face, a mandible, and most of the postcranial skeleton.

Sex: Initially identified as a female, based partially on size, though problematic due to the estimated age. Available metrics (Table S1.3) show the cranium as the smallest of the series. Several dental features suggest a female. The mandible is slender and even though the teeth are generally large, the canines are small, as often seen in females. Dental etching supports a female diagnosis.

Age: Initially identified as c. 18 year old (Brinch Petersen 1988). The 1992 analysis showed mandibular M2 and P2 erupted, and M2 with initial cusp blunting. M3s were unerupted. Recent work by VA suggests a 16–17 year old, consistent with Hillson's (1996) eruption stage 17, with an age of 15 years±6 months and a range of 14–16 years. These are consistent with several long bone fusion markers, based on Buikstra and Ubelaker (1994); iliac crest unfused (≤15 years), distal humerus unfused (≤17–18 years) and greater trochanter of femur unfused (≤14–19 years). A range of 14–17 years is appropriate.

Stature: Long bone lengths, including epiphyses, were available from radius, femur, tibia, and fibula. Female standards give a mean value of 150.9 cm (Table S1.2) and range from 145 to 155 cm, overlapping the estimate for Strøby Egede A, and overlapping the shortest Bøgebakken individual, HB4 at 150–160 cm. As the individual was subadult, with unfused epiphyses, stature estimates are minimal as the individual was still growing.

Pathology: None noted, consistent with age.

Cranial analysis: A generally fragmentary skull with partial vault and face, and mandible, and most of the cranial base missing. The face is crushed and damaged, obscured in preserved matrix at the time of the 1992 study. *In 1992 the mandibles of individuals B and C were reversed in the display; this is corrected here*.

Cranial inventory: Frontal (d/d), parietals (d/d-f), temporals (f-ff/ff), mastoids (-/ff), occipital (f/d-f), sphenoid (ff/ff), orbits (ff/ f), malars (d-f/-), maxillae (f-ff/d-f), mandibular body (d/d), mandibular rami (d/d).

Postcranial analysis: All bones apparently present, though identification and determination of status is problematic, especially the right side, within the matrix in the Museum display. Areas that could not be assessed were most of left hand and left ribcage, sternum and manubrium.

Postcranial inventory: Clavicles (d/ff), scapulae (f?/ff?), humeri (d?/ff), radii (ff/ff), ulnae (d/ff), innominates (ff/d), femora (i-d/i-d), patellae (?/i), tibiae (i?/i), fibulae (d?/d), ribs (?/++; -/ff), hand phalanges (?/10+; -/i?), metacarpals (?/5; ?/i-d?), carpals (3+/8; ?/i?), foot phalanges (12++; both sides), metatarsals (4/5; i?/i-ff), tarsals (6/5; i?/i?), cervical vertebrae (7/i?), thoracic vertebrae (8+/i-ff), lumbar vertebrae (2/i?), sacrum (d).

Dental analysis: The maxillary teeth were found in situ, though the posterior of the maxilla was destroyed post-mortem. Some mandibular teeth, mostly anterior, were also lost post-mortem.

R	d	d	+	+	+	+	+	+		+	+	+	+	d	+	d	d	L
	M3	M2	M1	P2	P1	C	I2	I1	+	I1	I2	C	P1	P2	M1	M2	M3	
	M3	M2	M1	P2	P1	C	I2	I1	-	I1	I2	C	P1	P2	M1	M2	M3	
	u	+	+	u	u	u	u	u		u	u	u	u	+	+	+	+	

The preserved M_3L was erupted but lacked wear facets, while the M_3R alveolus was wide and with a flat bottom, indicating that roots were not fully formed. It is possible that the apparently erupted M_3L had not been so in life. M2s were erupted and with wear facets on the enamel surfaces. M1s were worn, with dentin exposure in patches. All features are consistent with an adolescent.

Maxillary incisors were worn on incisal and lingual surfaces. Incisal wear exposed the dentin while lingual wear had altered lingual relief into a plane surface. There were numerous fine parallel striations in the vertical plane of the enamel. Lingual surfaces of the canines were polished by wear. Premolars had polished enamel wear, and the mandibular M_1 showed four dentin patches, corresponding to the cusps. M^1s had one lingual cusp with dentin exposure.

The attrition pattern of the anterior teeth shows use of the tooth as a tool, as well as normal dietary attrition. Interproximal wear facets between M_1 and M_2, indicate grinding of teeth during mastication. Enamel surfaces showed no hypoplasia. Marginal bone showed normal structure and no bone loss. There is little evidence for calculus.

Strøby Egede D
The only adult in the northern group, represented by a largely complete skeleton.

Sex: Identified as male by Brinch Petersen (1987; 1990), confirmed by dental etching. No sex assessment table was prepared in 1992; craniometric values identify the individual as large and maximum diameters of humeral and femoral heads are within the male range (see Stewart 1979). Stature estimates are at the male/female boundary. Craniometric overlap in individuals A and D (see Table S1.3) is consistent with the overlap in cranial size seen in Bøgebakken males and females (Table S1.7; data from CM unpublished and H.C. Petersen unpublished).

Age: Assessed as a 30 year old by Brinch Petersen (1987; 1990), later work suggests a younger age. The pelvis could not be assessed. Most telling is dental wear, notoriously heavy in Danish Mesolithic material (Alexandersen 1988). Wear in fully erupted 3rd molars was restricted to polishing, consistent with an age of *c*. 20; recent work by VA suggests a range of 20–25. No ectocranial suture closure was noted, consistent with an age of ≤30 years (Meindl & Lovejoy 1985). Finally, all observable postcranial epiphyses are fully fused. The overall pattern is consistent with a range of 20–25 years.

Stature: Long bone lengths were taken from humerus, femur and tibia (Table S1.2) with humerus length the most secure. Average for the three is 170.5 cm, with a range of 165–175 cm, similar to taller males at Bøgebakken (Table S1.2).

Pathology: We comment below on possible features on the cranium, and evidence for arthritis, the latter clearly age dependent. Four cranial features show similarities to those on Strøby Egede B, though none was diagnosed. Two are on the posterior of the frontal and two on the parietals; those on the left side (a and b below) could be extensions of each other.

- *Feature a*: slightly roughened depression of posterior left frontal, an apparent extension of b.
- *Feature b*: marked trough or depression of the left parietal running parallel to the coronal suture and divided into sections.
- *Feature c*: trough as in b on the posterior right frontal, again running parallel to the coronal suture but smaller and divided into three sub-sections.
- *Feature d*: an elliptical trough in the posterior right parietal. Possible radiating cracks at the posterior run laterally and then towards the lambdoid suture. A small central hole has an apparent bevelled edge and the anterior appears truncated. There is some similarity to the cranial lesion of the Gøngehusvej 7 CÆ1 female (Brinch Petersen *et al*. 1993) but the hole is clearly open and the edge roughened. Unpublished work by Niels Lynnerup and Pia Bennike tentatively suggests a healed lesion.

In summary, a, b and c may be gnaw marks. Similarity to the patterns on Strøby Egede B needs further examination. Feature d is different, with outer bevel measurements of 38 × 24 mm and the central hole of 14 × 6.5 mm. Apparently healed, so not directly related to the death of the individual. Whether from a blow or an accident is unclear.

We looked for evidence for arthritis and found none. Vertebral areas recorded were superior and inferior vertebral bodies of cervical through lumbar region, except T1–T3. No lower facets could be recorded for the same area and no observations could be made for the sacrum. Within the scoring of Nathan (1962) no visible changes were found on any surfaces (level 0), consistent with a young adult. For the remaining postcranial skeleton, sites could be scored for all primary limb bones except radius and ulna, all with scores of 0 or 0?, again consistent with a young adult. Finally, no changes were noted for the mandibular or temporal condyles.

Cranial analysis: All areas are represented except parts of the occipital immediately posterior to the foramen magnum and parts of the left zygomatic arch and left sphenoid. For craniometric dimensions see Table S1.3.

Cranial inventory: Frontal (i/d), parietals (i/d), temporals (d/d), mastoids (d/d), occipital (d-f/d-f), occipital condyles (i?/i?), sphenoid (d/d), ethmoid (d/d), orbits (i/i), nasals (i/f), malars (d/d), maxillae (i/d), mandibular body (i/i), mandibular rami (i/i).

Postcranial analysis: Though all bones appear to be present, identification and status determination was problematic as displayed, especially for left forearm.

Postcranial inventory: Clavicles (d/i), scapulae (ff/ff), humeri (d/d), radii (ff/-), ulnae (ff/-), innominates (f?/ff), femora (f/f), patellae (-/i), tibiae (ff/ff), fibulae (f?/ff), ribs (+/+; ff/ ff), hand phalanges (3+/5 (+3?); i/i), metacarpals (2+/4?; i/i), carpals (3+/2; i/i), foot phalanges (2?/-; i/-), metatarsals (2?/3; i/i-f), tarsals (1?/7; i/i), cervical vertebrae (7/i-ff), thoracic vertebrae (12/i), lumbar vertebrae (5/i), sacrum (f?), sternum (i), manubrium (i?).

Dental analysis: This is the only individual with a complete dentition.

R	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	L
	M3	M2	M1	P2	P1	C	I2	I1	+	I1	I2	C	P1	P2	M1	M2	M3	
	M3	M2	M1	P2	P1	C	I2	I1	-	I1	I2	C	P1	P2	M1	M2	M3	
	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	

The teeth tend to have extra cusps, the maxillary with a small paramolar tubercle on M^3R and Carabelli's cusps on both M^1R and M^1L. Maxillary molar cusp number was 4, 4, 3+. For the mandible, M_3R had an extra supernumerary cusp, C6, while mandibular cusp number and groove pattern was Y5, +4/X4, X5. Long enamel extensions were found on all four M3s.

Anterior maxillary tooth dentin exposure occurred incisally, while lingual surfaces showed polish. On the lateral incisors this was sharply demarcated from the basal and approximal surfaces. Lingual wear facets showed vertical striations. Chipping of the thin enamel rim occurred on I^1R, I^1L and I_2R, while both upper canines and the I^2L were rounded incisally by wear.

Dentin was exposed on the surface of both first molars and the premolars, and dentin exposures merged facially on both M_1R and M_1L. For M2 the enamel was worn in the maxilla with dentin barely exposed on the cusp tips of mandibular M2. All M3s showed initial polishing of the occlusal enamel, indicating full eruption.

Linear Enamel Hypoplasia (LEH) was observed on I^2R and I^2L, indicating stress at *c*. 4 years of age; all other teeth had normal enamel structure. It is possible that the incisor LEH was caused by local conditions in the jaws rather than generalised disturbance.

Marginal bone level was normal. Prominent roots showed dehiscences in the area of the mandibular canines. Slight calculus was observed lingually in incisors through premolars. The mandibular condyles showed remodelling that was not evenly rounded but had a roofed or 'tented' appearance with medial and lateral facets and a sharp anterior margin. The articular tubercle of the temporal showed a corresponding groove.

Strøby Egede E
This is the oldest of three children in the northern group, primarily represented by the postcranial skeleton.

Sex: Identified as a male by Brinch Petersen (1987; 1988), referring to a boy (*dreng* in Danish). Though not explicitly stated this is apparently related to the flint knife. The identification is verified by the dental etching.

Age: Originally assessed as 5–6 years old (Brinch Petersen 1987; 1988), recent examination by VA suggests a dental age of 4–5 years. The assessment from 1992 involved long bone lengths (Table S1.4), available for all primary upper and lower limb bones. Estimates based on Facchini and Veschi (2004) are 4.9–5.5 years from the arm and 4.4–4.7 years from the leg. The overall age estimate is 4–6 years.

Cranial analysis: No bones were visible in 1992 and no statement is possible on condition. However, presence of the cranium is clearly seen in the colour images (*farbtafeln*) in Brinch Petersen (1988), and initial work by VA identified the mandible and dentition (see below). In image 1, the colour coded diagram of the full burial, the cranium lies midway between the torsos of individuals B and C. In image 2, the colour photo of the burial *in situ*, it is possible to see an apparent crushed cranium, in multiple fragments. No further work has been done on this material.

Postcranial analysis: The skeleton was reasonably complete. Patellae, foot bones, sternum, and manubrium were not identified. Absence of the manubrium may be a function of age. The left upper limb was largely obscured in the display.

Postcranial inventory: Clavicles (i/i), scapulae (ff/-), humeri (d/-), radii (i/-), ulnae (f/-), innominates (d/d), femora (i/d), tibiae (d/i), fibulae (f/ff?), ribs (+/+; ff/ff), hand phalanges (6+/-; ff/-), metacarpals (1?/-; ff?/-), carpals (1?/-; ff/-), cervical vertebrae (7?/ff), thoracic vertebrae (9?/ff), lumbar vertebrae (5?/ff), sacrum (ff).

Dental analysis: All teeth shown as present were intact and in the jaws. This is a mixed dentition, with both deciduous and permanent teeth.

R	+	+	+	+	+	+	u		u	u	u	u	u	u	u	L
	M1	dm2	dm1	P1	dc	I2	I1	+	I1	I2	dc	P1	dm1	dm2	M1	
	M1	dm2	dm1	P1	dc	I2	I1	-	I1	I2	dc	P1	dm1	dm2	M1	
	u	u	u	u	+	u	u		u	u	u	u	+	+	+	

Deciduous molars were erupted and mildly worn. M^1R and M_1L tooth crowns were fully formed and I^2R had almost the entire tooth formed. Both deciduous right canines had wear facets with dentin exposure on distal parts of the cusps. All deciduous molars showed enamel wear; one first deciduous molar showed dentin exposure. No enamel hypoplasia was seen. M_1L had five cusps, while M^1R had four. I^2R showed a marked distal marginal ridge but no shoveling.

Strøby Egede F
The only younger child in the southern group, with only fragmentary remains observed.

Sex: No initial assessment was attempted and no identification possible from tooth-etching.

Age: Brinch Petersen (1990) identified this and individuals G and H as infants (*spædbørn*), though some later sources identify them as newborn (*nyfødt*). Dental age estimates from crown development (Liversidge *et al.*

1998) give estimates for dm1 and dm2 of 0.33±0.12 (*c.* 4 months) and 0.68±0.14 (*c.* 8) months for girls and 0.42±0.12 (*c.* 5 months) and 0.69±0.14 (*c.* 8) months for boys, overlapping with long bone length age estimates from femur and tibia (see Table S1.4), of roughly 8 months and 5 months (Facchini and Veschi 2004). The estimate from ulna (≤0 years) is not seen as valid.

Cranial analysis: Not possible.

Postcranial analysis: Largely fragmentary, with bones not identified from shoulder girdle, both patellae (age related), all hand and foot bones and sternum and manubrium. The right side was largely obscured in the display case.

Postcranial inventory: Humeri (-/ff), radii (-/ff), ulnae (-/ff), innominates (ff/ff), femora (-/f), tibiae (i/ff), fibulae (-/ff), ribs (?/?; ff/ff), cervical vertebrae (?/ff), thoracic vertebrae (?/ff), lumbar vertebrae (?/ff), sacrum (?/ff).

Dental analysis: The three mandibular molars recovered were loose. the crown of the deciduous pair was fully formed for dm1, ¾ complete for dm2. An isolated M1 cusp tip was found.

R	u	u	u	u	u	u		u	u	u	u	u	u	L
	M1	dm2	dm1	dc	di2	di1	+	di1	di2	dc	dm1	dm2	M1	
	M1	dm2	dm1	dc	di2	di1	-	di1	di2	dc	dm1	dm2	M1	
	u	u	u	u	u	u		u	u	u	x	x	x	

Strøby Egede G

This, and individual H below, are the two infants in the northern group; G is the least complete, with two associated truncated flint blades. Limited right side postcranial remains were identified. This is the only apparently disturbed individual, starting with the left leg. The left pelvis was moved *c*. 75 cm from its probable original location, found above the left knee of individual D, the last person buried. At the same time the femur and the lower leg bones are rolled around. This is a strange picture, but whether pre- or post-burial is unclear.

Sex: No assessment attempted and no tooth-etching possible.

Age: Recognised initially as an infant, the only estimate is from measurement of the femur, *in situ* in the display (>65 mm, Table S1.4). Given that average length of the femur at birth is *c*. 70–80 cm (Gowland and Chamberlain 2002), this figure is consistent with a newborn or late term foetus, though the latter is inconsistent with positioning in the burial group. Degree of completeness is not mentioned in the field notes.

Cranial analysis: None identified.

Postcranial analysis: Represented by fragmentary remains:

Postcranial inventory: Clavicles (f/-), humeri (ff/-), innominates (ff/-), femora (ff/-).

Dental analysis: None observed.

Strøby Egede H
This, with individual G, was identified as one of two infants in the northern group.

Sex: No assessment attempted and no tooth-etching possible.

Age: Initially identified as an infant (see also F and G above). Tooth germs and bone lengths are consistent with a newborn. Tooth germs for di^1 and di^2 were scored as crown complete and crown ¾, giving estimates of 0.1 years (*c*. 1 month) (Liversidge *et al.* 1998). This is consistent with bone lengths for ulna, humerus, femur, and tibia (Table S1.4) following Facchini and Veschi (2004).

Cranial analysis: No remains observed.

Postcranial analysis: Partially complete skeleton, damaged–very fragmentary. Bones of the shoulder girdle, patellae and fibulae, all hand and foot bones except two hand phalanges, and sternum and manubrium were not identified.

Postcranial inventory: humeri (d/d), radii (f/-), ulnae (i/ff), innominates (f/-), femora (f/f), tibiae (f/f), ribs (?/?; ff/ff), hand phalanges (-/2?; -/ff), cervical vertebrae (?/ff), thoracic vertebrae (?/ff), lumbar vertebrae (5?/ff), sacrum (ff).

Dental analysis: No information available beyond age (see above). The following loose tooth germs were identified.

R	u	u	u	x	x		x	u	u	u	u	L
	dm2	dm1	dc	di2	di1	+	di1	di2	dc	dm1	dm2	
	dm2	dm1	dc	di2	di1	-	di1	di2	dc	dm1	dm2	
	u	u	u	u	u		u	u	u	u	u	

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TABLES

TABLE S1.1: AGE FROM ECTOCRANIAL SUTURE CLOSURE AFTER MEINDL & LOVEJOY (1985)

Closure site	*Strøby Egede A*		*Strøby Egede D*	
	Score	*Age range*	*Score*	*Age range*
Lambda	0	31.2±9.3	0	31.2±9.3
Obelion	2	37.7±9.6	0	27.8±9.2
Anterior Sagittal	2	45.6±11.9	0	31.3±10.0
Bregma	3	49.2±10.7	0	33.6±10.4
Midlambdoid (L/R)	1/1	40.5±11.7	0/0	32.2±10.1
Midcoronal (L/R)	2–3/–	46.8±12.0/ 51.0±11.3	0/0	33.8±11.2
Pterion (L/R)	2?/–	40.2±9.3	0/–	29.9±8.9
Sphenofrontal (R/L)	–/–	–	0/–	34.9±11.3
Inferior Sphenotemporal (L/R)	1/?	45.6±12.8	0/–	38.0±11.6
Superior Sphenotemporal (L/R)	0–1/?	39.4±11.9/52.6±14.6	–/–	–
Average individual age assessment		41.8/43.7		32.5
Composite scores				
Lateral–anterior score	5–7	41.1±10.0/45.5±8.9	–	
Vault score	12–13	45.2±12.6	0	<30.5±9.6

TABLE S1.2: STATURE ESTIMATION AT STRØBY EGEDE BASED ON TROTTER & GLESER (1952)

Individual	*Sex*	*Bone*	*Side*	*Length in mm*	*Estimate if male (cm)*	*Estimate if female (cm)*
Strøby Egede A	Female	humerus	left	289	–	155.1±4.45
Strøby Egede A	Female	femur	left	388	–	149.9±3.72
Strøby Egede A	Female	tibia	left	307	–	150.6±3.66
Strøby Egede C	Female	radius	right	203	–	151.2±4.24
Strøby Egede C	Female	femur	left	393	–	151.2±3.72
Strøby Egede C	Female	tibia	left	315	–	152.9±3.66
Strøby Egede C	Female	fibula	right	303?	–	148.4±3.57
Strøby Egede D	Male	humerus	left	334	173.3±4.05	–
Strøby Egede D	Male	femur	left	443?	166.8±3.27	–
Strøby Egede D	Male	tibia	left	368??	171.4±3.37	–

? = slight estimation, ?? = moderate estimate (e.g. damage to long bone)

TABLE S1.3: CRANIAL MEASUREMENTS OF STRØBY–EGEDE ADULTS

Measurement			*Individual*		
Description	*Howells*	*Martin*	*Strøby A*	*Strøby C*	*Strøby D*
Maximum cranial length	GOL	M1	187	174?	187
Maximum cranial breadth	XCB	M8	157	130±5	148
Minimum frontal breadth	WFB	M9	108??	94	106
Maximum frontal breadth	XFB	M10	134???	–	123
Bistephanic breadth	STB	M10b	–	102??	112
Biasterionic breadth	ASB	M12	121?	106	112
Biauricular breadth	AUB	M11b	140	–	134
Basion–bregma height	BBH	M17	147?	–	150??
Basion–nasion length	BNL	M5	108	–	116?
Frontal arc	–	–	129	117	126
Frontal chord	FRC	M29	115	102	112
Frontal subtense	FRS	M29b	24	20	23
Parietal arc	–	–	126	113	129
Parietal chord	PAC	M30	111	102	116
Parietal subtense	PAS	M30a	26	19	25
Occipital arc	–	–	129	–	117??
Occipital chord	OCC	M31	110	–	102??
Occipital subtense	OCS	M31a	27	–	27??
Foramen magnum length	FOL	M7	35	–	–
Foramen magnum breadth	FOB	M16	–	–	27
Basion–porion length	BPL	M40	101	–	112
Nasion–prosthion height	–	M48	–	–	79
Nasion–prosthion length	NPL	–	71	–	72
Fronto–maxillary breadth	FMB	M43a	–	93	104?
Nasion subtense	NAS	M43b	–	19?	17
Interorbital breadth (maxillofrontal)	–	M50	24?	–	23?
Orbital height	OBH	M52	37?/–	–	34/34?
Orbital breadth	OBB	M51a	–/–	–	–/43
Bizygomatic breadth	ZYB	M45	151	–	140??
Nasal height	NLH	M55	56	–	53
Nasal breadth	NLB	M54	23?	–	26
Zygo–maxillary breadth	ZMB	M46b	–	–	102??
Zygo–maxillary subtense	ZMS	M46c	–	–	23??
Maxillo–alveolar length	MAL	M60	58	–	55
Maxillo–alveolar breadth	MAB	M61	70	–	71
Palatal breadth	PAB	M63	43	–	45
Palatal length	PAL	M62	48	–	49
Ectoconchion breadth	EKB	M44	–	–	106?
Bigonial breadth	BGB	M66	113	–	110
Total mandibular length	TLEN	M68(1)	111?	–	113?
Mandibular corpus length	COLE	M68	82?	–	83?
Bimental breadth	BM	M67	35	–	39
Mandibular height at M1/M2 jx	M1/2H	M69(2)	30/30	–	33/35
Mandibular breadth at M1/M2 jx	M1/2B	–	13/14	–	13/13
Mandibular ramal height	RH	M70	55/55	–	69/68
Mandibular ramal breadth	RB	M71H	33/34	–	37/36
Bicondylar breadth	BCB	M65	140	–	133

? = slight estimation, ?? = moderate estimate from e.g. distortion in skull shape, ??? major estimate from doubling measurement from one side of skull.

TABLE S1.4: SUBADULT AGE ESTIMATES FROM LONG BONE LENGTHS BASED ON FACCHINI & VESCHI (2004)

Bone	*Strøby Egede B*		*Strøby Egede E*		*Strøby Egede F*		*Strøby Egede G*		*Strøby Egede H*	
	Bone length mm	*Age in years*	*Bone length mm*	*Age in years*	*Bone length mm*	*Age in years*	*Bone length mm*	*Age in years*	*Bone length mm*	*Age in years*
Ulna	152	8.0	123	5.5	>55	≤0			58?	0
Radius	138	8.0	106	5.1						
Humerus	184	7.25	146	4.9					68	0
Femur	253	7.25	185	4.5	93	0.66	>65	≤0	77	0
Tibia			153	4.7	74	0.4			67	0
Fibula			143	4.4						

? = estimated

TABLE S1.5: DENTAL MEASUREMENTS OF STRØBY EGEDE PERMANENT DENTITIONS

Strøby Egede maxillary permanent teeth: bucco–lingual measurements

Grave	*Sex*	*Age*	*M3R*	*M2R*	*M1R*	*PM2R*	*PM1R*	*CR*	*I2R*	*I1R*	–	*I1L*	*I2L*	*CL*	*PM1L*	*PM2L*	*M1L*	*M2L*	*M3L*
Strøby Egede A	F	35–45													8.3	8.4			11.1
Strøby Egede B	F	6–9			11.15													11.2	
Strøby Egede C	F	14–17			11.25	9.4	9.8	8.3		7.2		7.3		8.2			12.0		
Strøby Egede D	M	20–25	11.4	12.4	12.35	10.5	10.0		6.9	7.8			7.0	9.0	10.0		12.3	12.2	11.45
Strøby Egede E	M	4–6			11.2														

Strøby Egede maxillary permanent teeth: mesio–distal measurements

Grave	*Sex*	*Age*	*M3R*	*M2R*	*M1R*	*PM2R*	*PM1R*	*CR*	*I2R*	*I1R*	–	*I1L*	*I2L*	*CL*	*PM1L*	*PM2L*	*M1L*	*M2L*	*M3L*
Strøby Egede A	F	35–45																	8.6
Strøby Egede B	F	6–9			11.2										6.8	6.5		8.4	
Strøby Egede C	F	14–17			10.5	6.3	7.2	8.0	8.8?	9.4			6.6	7.8			10.4		
Strøby Egede D	M	20–25	8.4	10.4		6.75	7.2		6.95	9.0				8.1	7.4		10.8	10.4	8.5
Strøby Egede E	M	4–6			10.3				7.0										

Strøby Egede mandibular permanent teeth: bucco–lingual measurements

Grave	*Sex*	*Age*	*M3R*	*M2R*	*M1R*	*PM2R*	*PM1R*	*CR*	*I2R*	*I1R*	–	*I1L*	*I2L*	*CL*	*PM1L*	*PM2L*	*M1L*	*M2L*	*M3L*
Strøby Egede A	F	35–45																	10.2
Strøby Egede B	F	6–9			10.0			7.0		5.9							10.3		
Strøby Egede C	F	14–17		10.1	10.4											8.0	10.6	10.3	10.25
Strøby Egede D	M	20–25	10.9	11.4	11.4	9.1	8.7	8.4	6.4	6.4		6.4	6.7	8.3		9.2	11.6	11.3	10.8
Strøby Egede E	M	4–6															10.7		

Strøby Egede mandibular permanent teeth: mesioo–distal measurements

Grave	*Sex*	*Age*	*M3R*	*M2R*	*M1R*	*PM2R*	*PM1R*	*CR*	*I2R*	*I1R*	–	*I1L*	*I2L*	*CL*	*PM1L*	*PM2L*	*M1L*	*M2L*	*M3L*
Strøby Egede A	F	35–45																	10.5
Strøby Egede B	F	6–9			10.5			6.4		5.3			5.4				10.3		
Strøby Egede C	F	14–17		10.5	10.6											6.6	10.75	10.5	10.75
Strøby Egede D	M	20–25	11.1	11.2		6.8	7.0	7.2	6.2	5.5		5.5	6.0	7.25		7.0	11.45	11.4	11.45
Strøby Egede E	M	4–6															12.1		

TABLE S1.6: DENTAL MEASUREMENTS OF STRØBY EGEDE DECIDUOUS DENTITIONS

Strøby Egede maxillary deciduous teeth: bucco–lingual measurements

Grave	*Sex*	*Age*	*dm2R*	*dm1R*	*dcR*	*di2R*	*di1R*	–	*di1L*	*di2L*	*dcL*	*dm1L*	*dm2L*
Strøby Egede B	F	6–9	10.0	8.9									
Strøby Egede E	M	4–6			6.2								
Strøby Egede F	?	5–8 mo											
Strøby Egede H	?	newborn											

Strøby Egede maxillary deciduous teeth: mesio–distal measurements

Grave	*Sex*	*Age*	*dm2R*	*dm1R*	*dcR*	*di2R*	*di1R*	–	*di1L*	*di2L*	*dcL*	*dm1L*	*dm2L*
Strøby Egede B	F	6–9	9.3	6.6									
Strøby Egede E	M	4–6	8.9	6.8	7.0								
Strøby Egede F	?	5–8 mo											
Strøby Egede H	?	newborn					6.1						

Strøby Egede mandibular deciduous teeth: bucco–lingual measurements

Grave	*Sex*	*Age*	*dm2R*	*dm1R*	*dcR*	*di2R*	*di1R*	–	*di1L*	*di2L*	*dcL*	*dm1L*	*dm2L*
Strøby Egede B	F	6–9											
Strøby Egede E	M	4–6			5.4							6.7	8.7
Strøby Egede F	?	5–8 mo											9.3
Strøby Egede H	?	newborn											

Strøby Egede mandibular deciduous teeth – mesio–distal measurements

Grave	*Sex*	*Age*	*dm2R*	*dm1R*	*dcR*	*di2R*	*di1R*	–	*di1L*	*di2L*	*dcL*	*dm1L*	*dm2L*
Strøby Egede B	F	6–9										7.5	9.6
Strøby Egede E	M	4–6			5.9							7.2	9.7
Strøby Egede F	?	5–8 mo											10.4
Strøby Egede H	?	newborn											

TABLE S1.7 – CRANIAL MEASUREMENTS OF VEDBÆK–BØGEBAKKEN ADULTS

Measurement			*Individual*									
Description	*Howells*	*Martin*	*HB1*	*HB2*	*HB3*	*HB5*	*HB8a*	*HB10*	*HB12*	*HB15*	*HB19A*	*HB22*
Sex			*Male?*	*Male*	*Female*	*Male*	*Female*	*Male?*	*Male*	*Male*	*Female?*	*Female*
Max cranial len	GOL	M1	196	189	167	190	176	201	182	197	183	177
Max cranial br	XCB	M8	139	141	150		146	164		157		142
Min frontal br	WFB	M9		96	96	96	101	111	106	98	107	94
Max frontal br	XFB	M10		116	117		117	134		125		115
Bistephan br	STB	M10b	110	109	115			126		119		113
Biast br	ASB	M12	117	105	114			114				112
Biauric br	AUB	M11b	128	125	135			147				122
Basion–bregma ht	BBH	M17					150	150				133
Basion–nasion len	BNL	M5					108	109				96
Frontal arc	–	–	121	123	120		116	148	134	132		116
Frontal chord	FRC	M29	108	110	105		105	125	118	115		103
Frontal subtense	FRS	M29b	24	23	25			31	26	25		24
Parietal arc	–	–	121	123	120		116	148	134	132		116
Parietal chord	PAC	M30	108	114	112		103	117		129		108
Parietal subtense	PAS	M30a	19	26	28			28		27		22
Occipital arc	–	–		126	118		124	142				119
Occipital chord	OCC	M31		103	97		103	113				99
Occipital subtense	OCS	M31a		30	25			34				28
For magnum len	FOL	M7						36				37
Foramen mag br	FOB	M16						28				29
Basion–porion len	BPL	M40						101				91
Nasion–prosth ht	–	M48		75				74	67			69
Nasion–prosth len	NPL	–		70				70	67			65
Fronto–max br	FMB	M43a		105	103			114	116	104		97
Nasion subtense	NAS	M43b		20	15			22		18		16
Interorbital br (maxillofrontal)	–	M50		25	19			25				25
Orbital ht	OBH	M52		34	31			31		30		32
Orbital br	OBB	M51a		40	39			46				40
Bizyg br	ZYB	M45		140	148			160		143		134
Nasal ht	NLH	M55		54				55				50
Nasal br	NLB	M54		23	25			27	21	26		22
Zygo–max br	ZMB	M46b		99				117				94
Zygo–max subtense	ZMS	M46c		26				29				21
Max–alveolar len	MAL	M60		53				58	56			53

Measurement			*Individual*									
Description	*Howells*	*Martin*	*HB1*	*HB2*	*HB3*	*HB5*	*HB8a*	*HB10*	*HB12*	*HB15*	*HB19A*	*HB22*
Sex			*Male?*	*Male*	*Female*	*Male*	*Female*	*Male?*	*Male*	*Male*	*Female?*	*Female*
Max–alveolar br	MAB	M61		66				74	61	70		60
Palatal br	PAB	M63		43				49	34	48		39
Palatal len	PAL	M62		47				52				44
Ectoconch br	EKB	M44		103				116		110		97
Bigonial br	BGB	M66		101				113				98
Total mandib len	TLEN	M68(1)		112				116				
Mand corpus len	COLE	M68		84				85				
Bimental br	BM	M67		49	46			83	45	46		
Mand ht at M1/M2 jx	M1/2H	M69(2)	24	31	26	32		38	29	34		
Mandibular br at M1/M2 jx	M1/2B	–	14	14	12	14		16	16	12		
Mand ramal ht	RH	M70		59		64		68				62
Mand ramal br	RB	M71a	36	36	32	37	34	42	37			37
Bicondylar br	BCB	M65		126	123			140				