THE HUMAN SKELETONS FROM THE LATE-MEDIEVAL GRAVEYARD OF SCHEEMDA

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ABSTRACT: A total of 65 human skeletons from Scheemda, the Netherlands, dating to c. 1275-1509 AD were studied and analysed. Sixteen skeletons belong to children or juvenile individuals. Traumatological and pathological features such as bone fractures, hypoplasia, rickets, osteoporosis, arthrosis and caries were diagnosed.

KEYWORDS: Scheemda, the Netherlands, Middle Ages, human skeletons, burials, sex, age, body length, trauma, hypoplasia, rickets, osteoporosis, arthrosis, caries.

1. INTRODUCTION

During the 1988 and 1989 excavations at Scheemda, remains of 65 human skeletons were uncovered. They were all found in the graveyard which was situated at the south and south-west end of the second church, and date from c. 1275-1509. Only five skeletons were excavated in 1989, all the others came to light during the first part of the project, in 1988. Not all of the skeletons turned out to be complete, some of them only included a few postcranial bones with or without parts of the skull. However, the major part consists of fairly complete skeletons in excellent state of preservation. The colour of the bones is dark brown. The individuals were buried in supine position, mostly with crossed arms, and all of them with the head toward the west (fig. 1). As can be seen from figure 2 some of the skeletons were buried in a sort of brick burial-vault. These burial-vaults were made of bricks of two different sizes. This means that remains of the first church of the early 13th century (built with small-sized bricks) as well as material used for the construction of the second church of c. 1275 (mainly large-sized bricks) had been used. However, most of the skeletons were simply buried in a pit with or without a wooden cover. Perhaps the people that were buried in burial-vaults belonged to a higher social class than the others. In the Late Middle Ages burials were no longer accompanied by grave goods, which means that the social status of individuals is difficult to establish. Moreover, the interpretation of post-mortem expressions of status (and sentiment) is not always a straightforward matter (Cannon, 1989). Some of the burials comprised the remains of several persons in stead of one individual. It is not clear whether this means that some people were reinterred or that some graves were used several times. In one small-sized grave (length: 1.35 m) three skeletons of children came to light.

2. DETERMINATION OF AGE

In order to determine the age of the buried individuals, the following methods were used. For the individuals younger than 25 years old it is possible to determine the age fairly accurately. Closure of the sutures between the various bones belonging to the skull, fusion of the proximal and distal ends of the long bones and eruption of the teeth are the most important characteristics for estimating the age of persons younger than 25. For individuals over 25, the determination is more complicated and less accurate. For these individuals one could use the 'complex method' (Ascadi & Nemeskeri, 1970) and/or the method of microscopic-histological age determination (Uytterschaut, 1985).

For both methods this means that the bone has to be cut in a longitudinal or transversal direction, which means that the bone is damaged. In this study I chose methods that do not involve damage to the bone, viz.: the degree of attrition of the occlusal surface of the teeth, change at the surface of the pubis symphysis and closure of the cranial sutures.

From table 1 it can be seen that 16 of the 65 skeletons excavated at Scheemda belong to children or young (not adult) individuals (fig. 3). This is 25% of the population. It is clear that infant mortality was higher in those days than it is nowadays. Ten children did not reach the age of eleven. One skeleton belongs to a newborn baby (fig. 4). Three children of 5-6, 6-7 and 9 years old were buried together in one small grave. Whether this means that they died together or from the same cause, we do not know. The skeletons do not show any traumatological or pathological features.

For 46 of the adult individuals it was possible to give an indication of age. Most of them were between 35 and 55 years old. Only two individuals attained an age of more than 55 years. However, it has to be noted that, because of the methods used in this analysis, it could be

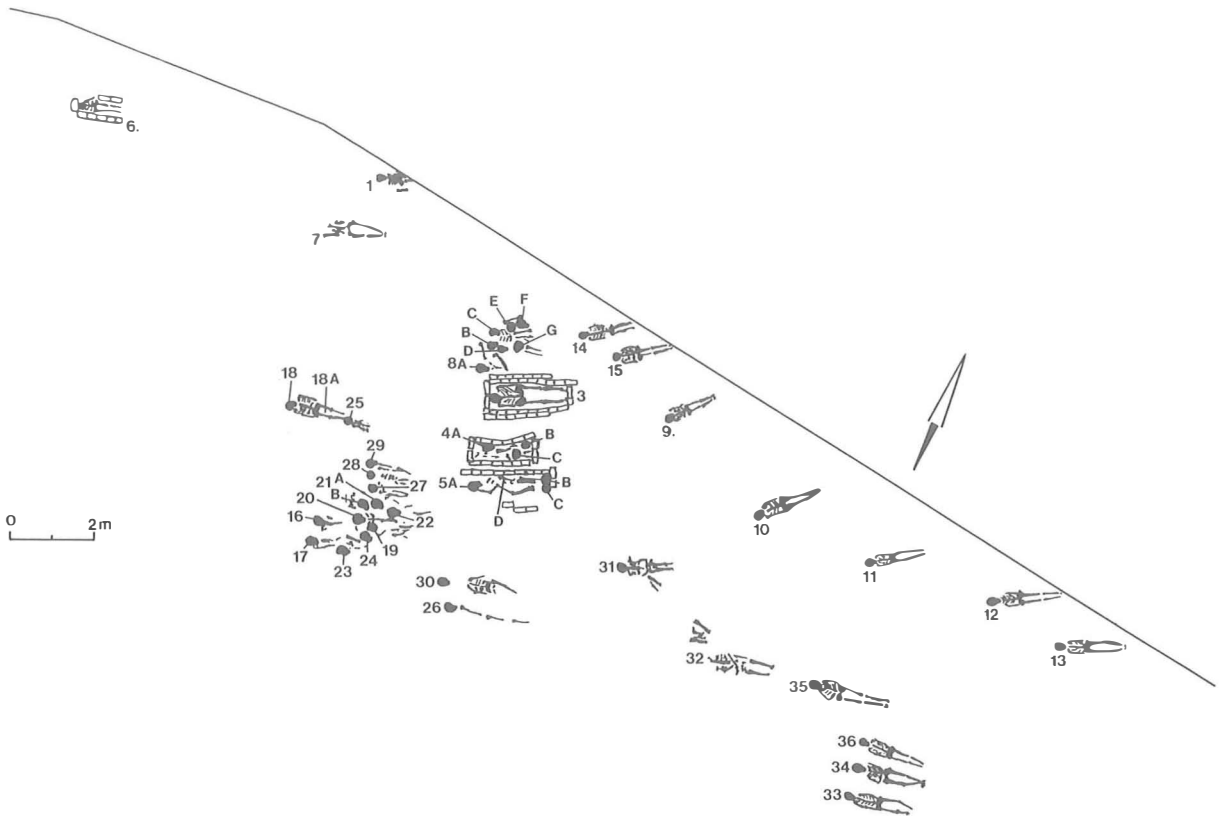

Fig. 1. Positions of the skeletons excavated in 1988 at the graveyard of Scheemda. Not all skeletons are indicated. For age and sex see table 1.

Fig. 2. Human skeleton in situ, in a shallow burial-vault made of large medieval bricks.

that the age of each adult individual was estimated too young and that most of them did not fall in the 35-55 year age class but in the class of 40-60 years. Of course life expectancy in those days was lower than that of more recent populations.

3. SEX DIAGNOSIS

With regard to the diagnosis of the sex of the person to whom the skeleton belonged, the first bone to look at is the pelvis. This bone gives very reliable results for the sex diagnosis of skeletons, with an accuracy of 90-95%. The angle between the rami of the two pubis bones (sub-pubis angle) is significantly larger in the female pelvis than in the male pelvis. Also the angle at the incisura ischiadica is larger in females than in males. Furthermore the shape of the pelvis inlet is small and round in males whereas it is broad and oval in females. In general, the long bones of men are longer and more robust than those of women. Also the points where the muscles insert on the bone are more pronounced in male than in female bones. Since the average stature of males and females is different in each population and for each period, it is

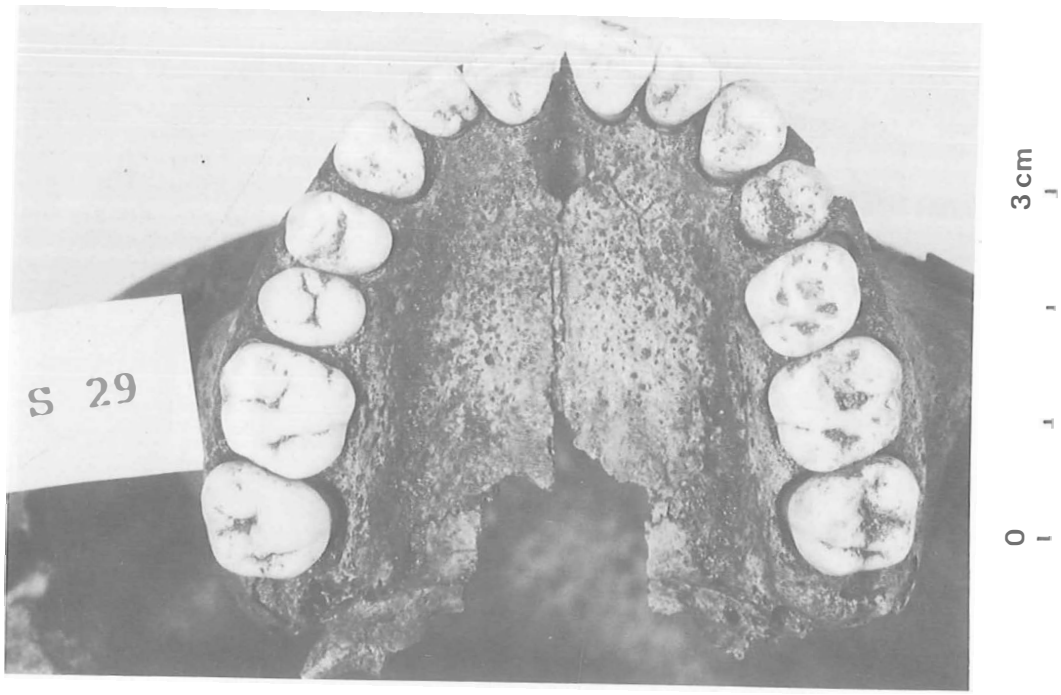

Fig. 3. Upper dentition of an individual with an estimated age of 15-17 years.

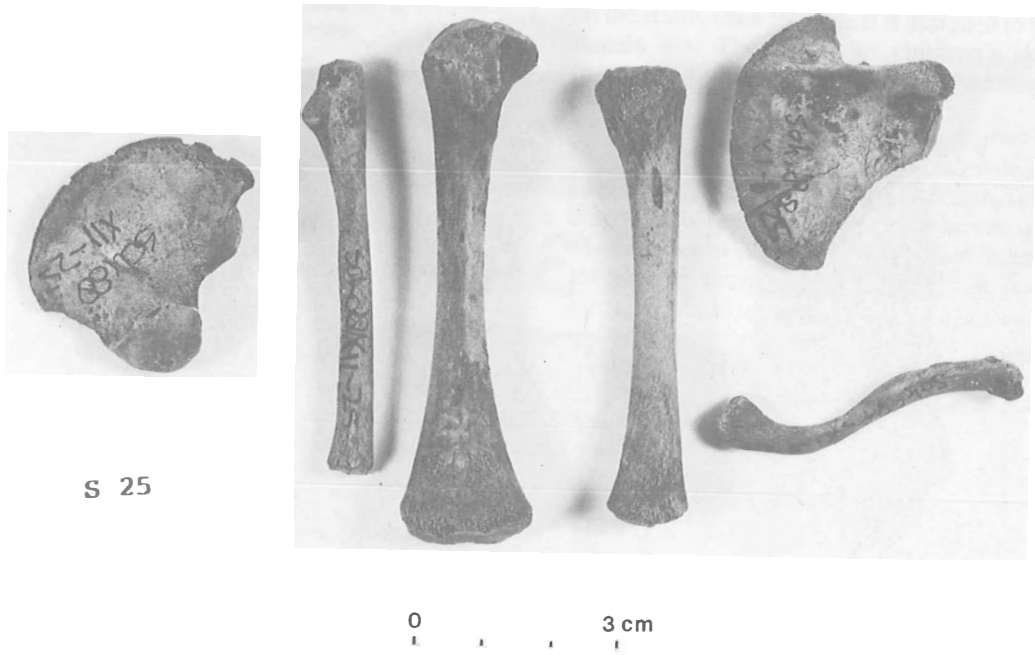

Fig. 4. Skeleton of a newborn baby.

Fig. 5. Skull of a man, showing an opening on the frontal part of the crown.

Fig. 6. Horizontal lines and pitting in the enamel of the teeth, features of growth disturbances known as hypoplasia.

Table 1. Summary of the age, sex and length of the 65 human individuals.

Skeleton number	Age	Sex	Stature
1	40-50	Man	1.78 m
2	30-40	Man	–
3	50-60	Man	1.88 m
4 A	9-10	–	–
4 B	5-6	–	–
4 C	±9	–	–
5 A	35-45	Man	1.81 m
5 B	>55	Man	1.79 m
5 C	>40	Woman	–
5 D	35-45	Man	–
6	6-7	–	–
7	Adult	Man	1.77 m
7 A	Adult	Man	–
7 B	35-45	Man	–
7 C	±5	–	–
8 A	45-55	Man	–
8 B	35-45	Woman	–
8 C	35-45	Woman	1.59 m
8 D	35-45	Woman	–
8 E	35-45	Woman	1.57 m
8 F	±8	–	–
8 G	2	–	–
8 H	>45	Woman	1.64 m
9	30-40	Woman	1.65 m
10	>40	Man	1.80 m
11 A	45-55	Man	–
11 B	35-45	Man	–
12	>50	Woman	–
13	Adult	Woman	–
14	35-45	Woman	1.50 m
15	35-45	Man	–
16	35-45	Man	1.75 m
17	45-55	Man	1.79 m
18	>50	Woman	1.67 m
18 A	±4	–	–
19	35-45	Man	1.67 m
20	34-45	Man	–
21	Adult	Man	1.82 m
21 A	40-50	Man	1.91 m
21 B	35-45	Man	1.71 m
22	15-17	–	–
23	>45	Man	1.79 m
24	45-55	Man	1.82 m
25	Neonate	–	–
26 A	±21	Woman	–
26 B	Adult	Man	–
27	35-40	Woman	1.70 m
28	8-9	–	–
29	15-17	–	–
30	>45	Woman	1.66 m
31	±19	(Woman)	1.63 m
32	±18	(Man)	1.71 m
33	45-55	Man	1.83 m
34	35-45	Woman	1.62 m
35	30-40	Woman	1.59 m
36	35-45	Man	1.78 m
A	Child	–	–
B	Adult	–	–
C	±25	Man	–
D	Adult	Man	1.77 m
50 A	35-40	Woman	–
50 B	Adult	Man	1.72 m
50 C	15-18	–	–
50 D	Adult	–	–
50 E	Adult	–	–

difficult to use the length of a long bone as a discriminant factor between males and females. More promising are the measurements of the joints (breadth at the ends of the long bones, viz. the epiphyses). Not only the pelvis and the long bones are used in a sex diagnosis but also the skull can give some information. Of course the differences between the skulls of men and women are less distinct than the differences in the pelvis. Male skulls show more pronounced points of muscle insertion, especially at the temporal lines and the nuchal region.

The eyebrow-arches are better developed and more protruding than in the female skulls. Moreover, the processus mastoideus is better developed and the zygomatic arches show an irregular surface in male skulls. The pelvis as well as the skull of each individual is given a certain score for each of the mentioned features, which has to be multiplied with a weighing factor. After this, the values are added up and depending on the result, each individual is assigned to the male or female sex. The sexing of children's skeletons is extremely difficult since most of the features are not yet or not clearly developed.

Forty-six of the forty-nine adult skeletons could be assigned to either a male or female individual (see table 1). For three individuals it was not possible to give a sex diagnosis because the material was too incomplete. Twenty-nine skeletons belong to male individuals and seventeen to females. The skeleton of the young person of c. 19 years old probably belongs to a female individual.

Combining the results of the sex diagnosis with the results of the age determination, no significant differences were found between the average age of males and the average age of females.

4. DETERMINATION OF STATURE

Estimations of the stature of the individuals were based on the length of the long bones of the lower extremity (femur, tibia and fibula). First, the lengths of these bones were measured, subsequently these values were multiplied by a certain factor according to Trotter and Gleser's table (1958), which gives an estimation of total body length. In order to apply this table, it is necessary to know the sex of the individual.

The stature of 19 adult male individuals could be estimated (see table 1), which produced a mean value of

Fig. 7. Vertebra with 'lipping', caused by arthrosis.

Fig. 8. Arthrosis of the pelvis-femur joint.

1.78 m. Two of the males turned out to be remarkably tall, 1.88 m (the skeleton of fig. 2) and 1.91 m. For the adult female group, the length of 11 individuals (see table 1) could be estimated, which led to a mean value of 1.62 m. Of course these values are lower than the mean stature of males and females nowadays; however, compared to those in the Early Middle Ages and the 17th century, these values turn out to be rather high.

5. TRAUMA AND PATHOLOGY

With regard to trauma there are only two individuals that show signs of wounds, possibly caused by violence. One is the skull of a man that shows an opening (4 cm across) in the frontal part of the crown, just anterior to the glabella (fig. 5). It could be that this opening was made by a sharp instrument (e.g. arrow-head). The second form of trauma found in this population is less severe, it concerns a healed wound halfway along the tibia, possibly caused by a fracture.

Although most diseases leave no traces on bone material, there are several individuals that show pathological features (see table 2).

Growth disturbances are clearly visible on the teeth shown in figure 6. These teeth belong to a woman of 35-45 years old. From the horizontal lines and the pitting on the enamel it is still possible to see that earlier in life (the period when the enamel of the teeth is formed), she suffered from deficiency of certain minerals. Each horizontal line is evidence of a period in which the formation of enamel was defective.

One person possibly suffered from rickets, a condition caused by vitamin D deficiency. One of the features of rickets is that the legs are bowed in anterior-posterior direction.

A more common example of a metabolic disease is osteoporosis, although only one individual in this population shows features of this. The skeleton belongs to a woman over 50 years old. The cortex of the bones is very thin and porous. This is caused by the fact that at a certain age the lower level of hormones impedes the forming of normal bone. Many women over 50 and men over 60, even nowadays suffer from this condition.

Features of arthrosis, another fairly common disease, were seen in several individuals, especially at the vertebrae. Eleven individuals have one or more vertebrae with 'lipping' (fig. 7). This 'lipping' consists of osteophytes, which is new bone formed around the articular facet caused by the degeneration of the joint-cartilage. All but one of these individuals are older than 45. Joint diseases are not restricted to the vertebrae but also other affect joints such as the pelvis-femur joint. Arthrosis of the pelvis-femur with severe eburnation of the femur head (the head becoming smooth and glossy) could be seen in two individuals (fig. 8).

Features of inflammation (osteomyelitis) can be seen in the diaphysis (shaft) of one femur, while the femur of another person shows features of myositis ossificans (ossification of muscle tendons) (fig. 9).

Table 2. Summary of the traumatological and pathological features.

Skeleton number	Age	Trauma/pathology
5 D	>55	Opening (4 cm across) in the frontal part of the crown, justanterior to the glabella
		Lipping and ankylosis of cervical and lumbal vertebrae
		Several teeth of the upper jaw show attrition of the root
36	35-34	Healed wound halfway along the tibia, possibly caused by a fracture
34	35-45	Hypoplasia (horizontal lines and pitting in the enamel of teeth)
		Caries in right P2 and right M1
13	Adult	Diaphysis of the femur is slightly bowed in anterior-posterior direction. Rickets
12	>50	Thin and porous cortex of the long bones. Osteoporosis
30	>45	Features of inflammation in the shaft of the left femur. Osteomyelitis
10	>40	Ossification of muscle tendons at the distal part of the left femur. Myositis ossificans
18	>50	Eburnation and osteophytes on the femur head and pelvic acetabulum, especially on the left side. Arthrosis
		Lipping of vertebrae
		Caries between the root and crown of upper premolar
17	45-55	Eburnation and osteophytes at femur heads and acetabula (of pelvis), especially at left side. Arthrosis
		Lipping of vertebrae
		Caries in left and right M3, and right M2
3	50-60	Lipping of vertebrae
		Caries in right M2 and M3 and right P2
		Several abscesses on the right upper jaw, of which two are extremely severe; one at M1 and one at M3
		Left M2 shows attrition of the root
33	45-55	Lipping of vertebrae
		Caries in several teeth
21	Adult	Lipping of vertebrae
8 H	>45	Lipping of vertebrae
		Caries in left M2
24	45-55	Lipping of vertebrae
		Caries in left M1 and right M2
11 A	45-55	Lipping of vertebrae
5	35-45	Lipping of vertebrae
50 D	Adult	Lipping of vertebrae
21 B	35-45	Caries in right M3
19	35-45	Caries in right M2
1	40-50	Caries in right M1
8 E	35-45	Caries in right M2 and right M3

5.1. Dentition

Apart from hypoplasia (mentioned above) other pathological features of the dentition include two instances of abscesses and several cases of caries. One of the former concerns a person who suffered from several abscesses. Caries was discovered on the teeth of 11 individuals. It is clear that in those days there was significantly less

Fig. 9. Right: myositis ossificans (ossification of muscle tendons) at the distal end of a left femur. Left: Normal femur, for comparison.

caries than nowadays. Of course this is related to diet. In general the food was much harder, which can be seen from the degree of attrition of the occlusal surface of the teeth. In two cases this attrition was not limited to the crown but extended to the level of the root.

6. SUMMARY

During the excavations at Scheemda, remains of 65 human skeletons, dating from c. 1275 to 1509, were uncovered. Although not all of the skeletons were complete, their state of preservation out to be excellent. They were buried supine with the head to the west. Most of the individuals were simply buried in a pit in the ground, but some of them were laid in brick burial-vaults.

Sixteen of the 65 skeletons belong to children or juvenile individuals. Ten children did not reach the age of eleven and one skeleton belongs to a newborn baby. Three children (all between 5 and 9 years old) were buried together in one small grave. Most of the adult individuals were between 35 and 55 years old. Twenty-nine skeletons belong to male individuals and seventeen to females. The mean stature of the male individuals was found to be 1.78 m and of the females 1.62 m. Two male individuals even reached a length of 1.88 m en 1.91 m.

One skull of a man shows an opening in the frontal part of the crown, possibly caused by intrusion of a sharp instrument. Growth disturbances are clearly visible on the teeth of a woman of 35-45 years old. Deficiency of certain minerals during growth can be inferred from the horizontal lines and pitting in the enamel. One person possibly suffered from rickets (vitamin D deficiency). Features of arthrosis, a fairly common disease, could be seen in several individuals.

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8. REFERENCES

ASCADI, G. & J. NEMESKERI, 1970. *History of human life and mortality*. Budapest.

CANNON, A., 1989. The historical dimension in mortuary expressions of status and sentiment. *Current Anthropology* 30, pp. 437-458.

TROTTER, M. & G.C. GLESER, 1958. A re-evaluation of estimation of stature based on measurements of stature taken during life and long-bones after death. *American Journal of Physical Anthropology* 16, pp. 79-123.

UYTTERSCHAUT, H.T., 1985. Determination of skeletal age by histological methods. *Zeitschrift für Morphologie und Anthropologie* 75, pp. 331-340.