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An Early / Middle Bronze Age common grave at Wassenaar, the Netherlands. The physical anthropological results

The physical anthropological study of skeletal remains from a common grave at Wassenaar has provided demographic and palaeopathological information on the Bronze Age group of people who had been buried in the grave.

The group consisted of men, women and children who had been interred according to different burial practises.

Bone lesions indicating a violent death were found only on skeletons of male individuals.

1. Introduction

In April 1987 a grave dating from the Early/Middle Bronze Age was excavated by archaeologists from Leiden University. The grave contained the skeletons of 12 individuals, one of which had a flint arrowhead between the ribs. See the plan of the grave (figs 1, 2).

Skeletons from this period are seldom recovered in the Netherlands because of the poor local preservation conditions for bone. Our skeletal remains were also in a very bad condition. Especially in the southwestern part of the grave the state of preservation was so poor that it was virtually impossible to identify the individual bones of the upper parts of the skeletons (Nos 6, 7, 8). Moreover, the skeletons deteriorated rapidly on exposure during excavation.

Because of this and the risk of the loss of valuable information during transport, the physical anthropological research was carried out in the grave where possible. This included sex and age determinations and the measurement of long bones and of the total skeleton length of the individuals *in situ*. The skulls were not measured because of the postmortem deformation due to the pressure of the soil.

As it was impossible to lift the bones individually, the skeletons were removed in their entirety, together with the underlying soil. Further cleaning and preservation took place in the laboratory.

Eventually the various parts were fitted together, like a jigsaw puzzle (see fig. 3), for exhibition purposes.

The communal character of the burial and the discovery of a flint arrowhead between the ribs of one of the skeletons determined the main objective of our study, *i.e.* to determine whether the demographic and palaeopathological data obtained for the group could shed any light on the event which had taken place so long ago.

2. Materials and Methods

The individuals had been buried in a grave of approx. 230 × 210 cm, oriented NNW-SSE (see fig. 1). The orientation of the skeletons in the grave was roughly WSW-ENE. Five individuals (Nos 1, 2, 3, 4, 5) were positioned with their heads in the east and seven individuals (Nos 6, 7, 8, 9, 10, 11, 12) with their heads in the west. Six (Nos 1, 2, 3, 5, 9, 10) had been interred on their dorsal and two (Nos 6, 11) on their ventral sides. The legs of the latter were bent slightly to the left. Four others (Nos 4, 7, 8, 12) were positioned on their sides, two on their left sides and two turned slightly on their right sides.

On the whole, the skeletons were still well articulated. Disarticulations and missing parts were attributable to post-depositional displacements, either as a natural consequence of decay or due to bioturbation. In one case only, *i.e.* that of individual No. 4 (a child), was the skull out of position (see fig. 1).

Due to the poor condition of the bones and the request for the use of the reconstructed skeletons for an exhibition we were unable to perform detailed examinations.

2.1 Age assessment

The age of the children and juveniles was inferred from the mineralization and eruption status of the deciduous and permanent teeth (after Ubelaker 1984) and from the closure of the epiphyses of the postcranial skeleton (after Krogman/Iscan 1986). The length of the long bones was also considered, although it is a less reliable age indicator as it should be regarded in relation to the adult stature of a reference population (Trotter/Gleser 1952, 1958). In one case only, i.e. that of the poorly preserved skeleton of individual No. 8, was the length of a long bone the sole age indicator available (reference material: Maresh 1955).

The age of the adults was more difficult to assess. The complex method of age diagnosis based on the degree of fusion of the internal sutures, the structure of the cancellous

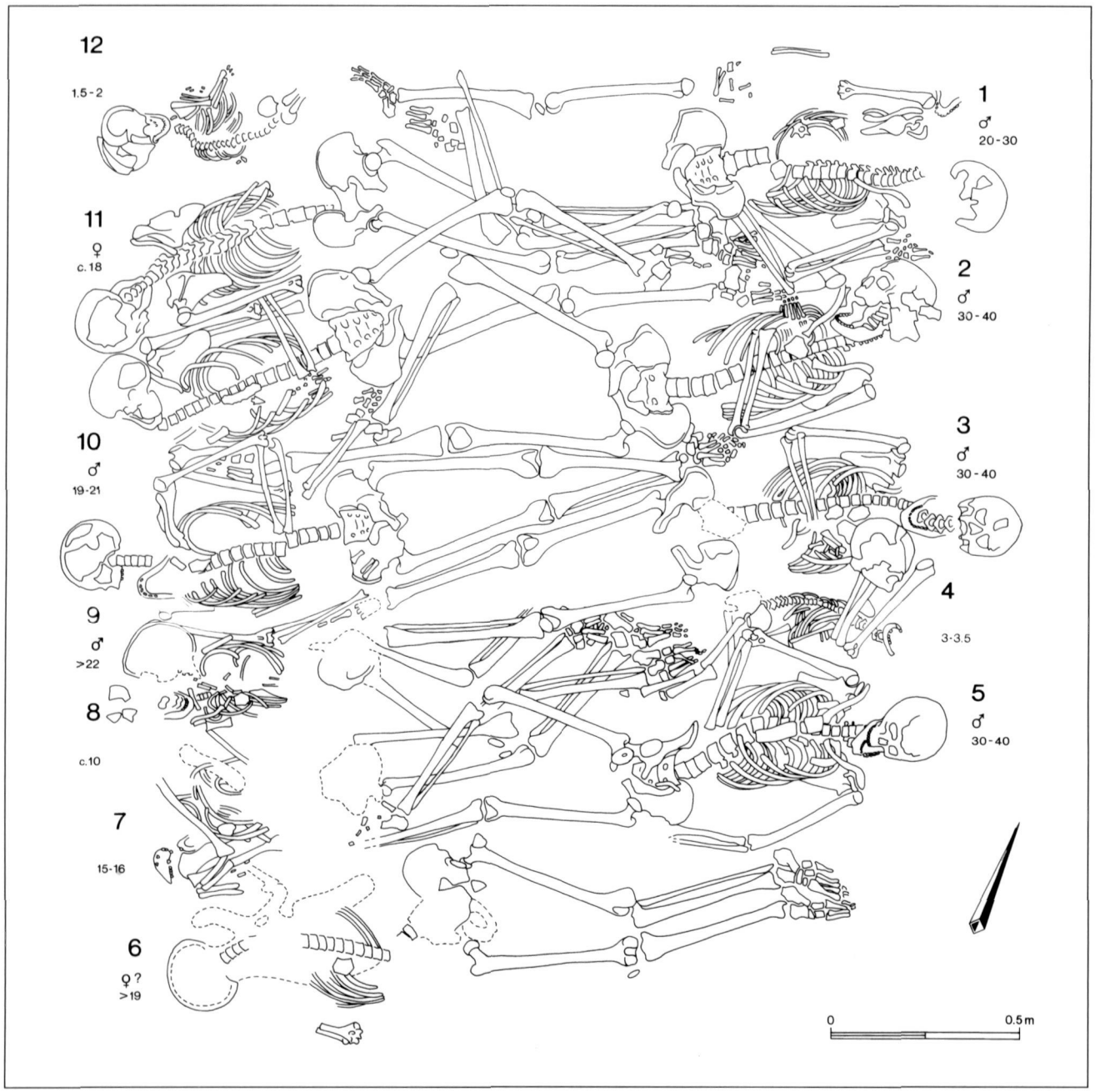

Figure 1. The grave.

bone of the proximal epiphyses of the femur and humerus and the appearance of the pubic symphysis (Workshop of European Anthropologists 1980) could not be used here as it would have been too destructive. The only indicators that could be used were the degree of fusion of the external sutures (Rösing 1977) and the degree of attrition of the teeth.

We took the degree of attrition of the teeth as our main age indicator. Attrition phases after Brothwell (1981) were numerically scored according to the method proposed by Maat and Van de Velde (1987). The ages thus derived are considered normal for pre-medieval populations (Brothwell 1981). The individual rate of attrition can be established by comparing the degree of attrition of the first and second

molars of the permanent teeth. The first molar erupts six years before the second one, which means that the difference in attrition between the two also covers a period of six years. The attrition rate of a population is defined as the mean value of all individual attrition rates.

2.2 Sex determination

The sex of the individuals was determined on the basis of non-metrical morphological characteristics of the skull and the pelvis. They were scored according to the criteria indicated by the Workshop of European Anthropologists (1980).

The scores were -2, -1, 0, +1, +2, which stand for super-female, female, indifferent, male and super-male, respectively. Some sex characteristics are more discriminative than others and a different weight is therefore attached to each characteristic. The degree of sexualisation is the mean weighed outcome of all the observed characteristics. A negative value indicates a feminine and a positive value a masculine development. Only the adults were studied in this way.

2.3 Stature

The lengths of the long bones and the total length of the skeleton, from the upper part of the skull to the most distal point of the tuber calcanei, were measured *in situ*. The bone lengths were checked after the bones had been cleaned in the laboratory. The statures were calculated according to the method proposed by Trotter and Gleser (1952, 1958).

3. Results

3.1 Demographic data

The group consisted of six men, two women and four children. One individual (No. 6) in the southwestern corner of the grave was too incomplete to allow sex determination. Its sex had to be inferred from the position of the body within the grave and relative to the other bodies (see the discussion below).

There were two children in the age category 0-6 years (Infans I), one child in the age category 7-14 years (Infans II) and one of 15-16 years (Juvenil).

The ages of the adults were inferred from the individual degrees of attrition as described above. The attrition rate of the group as a whole was approx. 0.6 (n=4, mean = 0.58, s.d.= 0.14). The attrition rate of one of the women (No. 11) was twice as high as the average rate of the males (Nos 2, 3, 5). After relating individual degrees of attrition to the degree of fusion of epiphyses and sutures we established a sequence of estimated ages at death (see tab. 1).

All the adults had died before the age of forty. In the case of two individuals, Nos 6 and 9, the degree of epiphysial fusion indicated that they were adults but it was impossible to arrive at a more precise assessment of their age as no teeth were available.

Table 1. Total count of individuals recovered from Wassenaar.
* = estimated age at death after seriation of molar attrition.
** = corrected for age.

Individual	Age(years)*	Sex	Stature(cm)**	Pathology
1	20-30*	male	167	
2	30-40*	male	182**	cutting blow
3	30-40*	male	176**	cutting blow
4	3-3.5	-		
5	30-40*	male	169**	cutting blow
6	>19	female?	170	
7	15-16	-	ca.170	
8	ca.10	-		
9	>22	male	176	
10	19-21*	male	177	arrowhead
11	ca.18	female	182	
12	1.5-2	-		

3.2 Stature

The average adult male stature of this group was 174.8 cm. It should be noted that individual No. 7, aged 15, already had a stature of approx. 170 cm and that individual No. 11, aged 18, had a stature of 182 cm!

3.3 Traumatology

An arrowhead (see fig. 2) was found between the ribs of individual No. 10, a young man of about 19-21 years of age.

Individual No. 2, a man of about 30-40 years of age, had a wedge-shaped injury on the left side of his lower jaw, the thin end pointing towards the front of his jaw (see fig. 3).

Individual No. 5, a man of 30-40 years of age, had the same kind of injury on his forehead (frontal bone).

A third, similar injury, was observed on the posterior part of the right upper arm of individual No. 3, also a man of 30-40 years of age.

No bone reaction (growth/healing) was observed at all these injuries.

A remarkable case was that of individual No. 4, a child of approx. 3 years of age, whose head was found on top of the left side of the chest of the nearest individual (No. 3). The lower jaw was still in a natural anatomical position in front of the cervical vertebrae. No injuries were observed.

3.4 Discussion

All the identified males were lying on their backs, at the centre of the grave. The only morphologically identified

Figure 2. The arrowhead *in situ*.

female, No. 11, lay at the far end of the grave, in the northwestern corner; individual No. 6 lay in the southwestern corner. Individuals Nos 6 and 11 had both been interred face downwards, with their legs in the same positions. If we may draw any conclusions from the relative positions of these individuals in the grave (see Louwe Kooijmans, this volume) then we may conclude that No. 6 was probably a female, too. That would imply that the men and women had been interred differently. All four subadults had been buried more or less on their sides. Sex-related differences in burial practises could indicate differences in the roles of men and women in the social organisation.

Another indicator of social organisation could be the dental attrition rate. It was quite clear that the attrition rate of the female (No. 11) was twice as high as the average rate of the males (Nos 2, 3, 5). Such a difference could be the result of culturally defined habits. Perhaps men and boys were offered the best food whereas women and girls had to make do with the leftovers, containing more grit (Wells 1975). Another possibility is that certain cultural activities in which the teeth were used as a tool were carried out by women (Molnar 1972).

We must of course bear in mind that we are discussing the attrition rate of only one woman; her teeth may have had a different enamel thickness (Molleson/Cohen 1990).

As adult stature is not only dependent on genetic factors but also on general welfare, nutrition and hygiene, it varies for different populations in time and space (Roede/Van Wieringen 1985). Deficiencies in diet and diseases can retard growth, whereas prolonged favourable conditions can result in a considerable increase in length after several generations. The average calculated stature of the males of this group is quite tall compared with that of males of historical times in the Netherlands: approx. 166 cm in the 17th and 18th centuries AD and 165 cm in the first quarter of the 19th century AD (Maat 1993). Due to improved socio-economic conditions the average stature of the Dutch male population even increased to 178 cm in 1965 and 182 cm in 1980 (Roede/Van Wieringen 1985). In view of these considerations, the adult stature of the excavated men of the Wassenaar group seems to indicate a rather healthy lifestyle.

Tall statures were rather common in the Bronze Age (Van den Broeke 1992; Dienst Gem Arch. Velsen 1989; Louwe Kooijmans 1973; Modderman 1964; Verwers 1966); measurements obtained for other skeletons (through calculation or by measuring the skeletons *in situ*) range from 169 to 187 cm.

The demographic composition of the group and the recorded palaeopathological changes were our main source of information in reconstructing what may have happened at Wassenaar.

Was there an armed conflict between warriors or an economically motivated raid on the inhabitants of a rural settlement (see Louwe Kooijmans, this volume)? A communal burial alone does not constitute conclusive evidence for a violent cause of death. Other factors, such as

Figure 3. Individual No.2 with the wedge-shaped injury on the left side of the lower jaw.

a serious infectious disease or ritual depositions (Cunliffe 1993), may also explain why several persons died within a short span of time. It should also be kept in mind that bone remains do not always reveal the cause of death.

The composition of the group in terms of sex and age, and in particular the presence of women and children, precludes the possibility of a conflict between groups of warriors. However, the group is not entirely representative of a domestic community either, as it lacks old people and includes only two women.

Material objects like the flint arrowhead found between the ribs of male No. 10 are clear indications of the cause of death. No more objects of this kind were found, but the injuries on the bones of the males Nos 2, 3 and 5 have been interpreted as cutting blows. The injury on the upper arm of male No. 3, for instance, may easily have been inflicted as he was attempting to ward off an attack.

The absence of any signs of bone reaction at these lesions proves that the wounds had not healed. It implies that the injuries were caused shortly before or at the time of death. A remarkable fact is that all these injuries were found on males only!

Other examples of injuries caused by projectiles, such as arrowheads, or hand-held weapons, such as swords or axes, are well-known in European prehistory. For example, in the case of the Neolithic grave containing the skeletons of a man, a woman and two children discovered at Fengate (Pryor 1976) an arrowhead that was found between the ribs of the man indicated the cause of his death. Another Neolithic grave containing the skeleton of a man who had been hit by several arrowheads was discovered at Stonehenge (Atkinson/Evans 1978). Both of the skulls of the two male individuals buried in the Neolithic grave at Sant Quirze del Valles had been mutilated and a flint arrowhead projected from the vertebra of one of the two (Campillo *et al.* 1993). Six individuals found in a Neolithic mass grave at 'San Juan ante portam Latina' showed injuries caused by flint arrowheads (Etxeberria *et al.* 1991). A more detailed and extensive description of similar cases is given in the article by Louwe Kooijmans (this volume).

Missing parts of skeletons and disarticulations may also indicate a violent death. This brings to mind the position of the skull of child No. 4. If the position in which the head was found is the result of human intervention, it implies a highly complex form of *deliberate pre-* or *post mortem* decapitation, which is not understandable from an anatomical point of view as the lower jaw was still in place. It is more likely that the head was moved after interment. However, post-depositional processes cannot have been responsible for this kind of displacement. Some unknown post-depositional process must have taken place (see Louwe Kooijmans, this volume). Something similar may hold for individual No. 8, but poor preservation conditions and the disturbance of this part of the grave made it impossible to verify whether that was the case.

The other individuals showed no signs of violence. This may be due to the total absence of violence, to the disappearance of indications of soft tissue injuries or to the bad state of preservation of the bone.

We have only circumstantial evidence suggesting that they died a violent death along with the others.

4. Conclusion

The skeletal remains of the Early/Middle Bronze Age group found at Wassenaar showed that it had consisted of men, women and children. The group may have lived in a settlement on one of the dune ridges in the vicinity (see Louwe Kooijmans, this volume). The average age at death was rather young as there were no individuals above the age of 40. Their stature suggested that they had lived under favourable socio-economic conditions. The differences in the burial practices used and in the molar attrition rates may reflect a cultural sex-based differentiation in status. An arrowhead found between the ribs of a young man and several traumatologic injuries on the bones of other males constitute strong evidence for a COMMON violent death.

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