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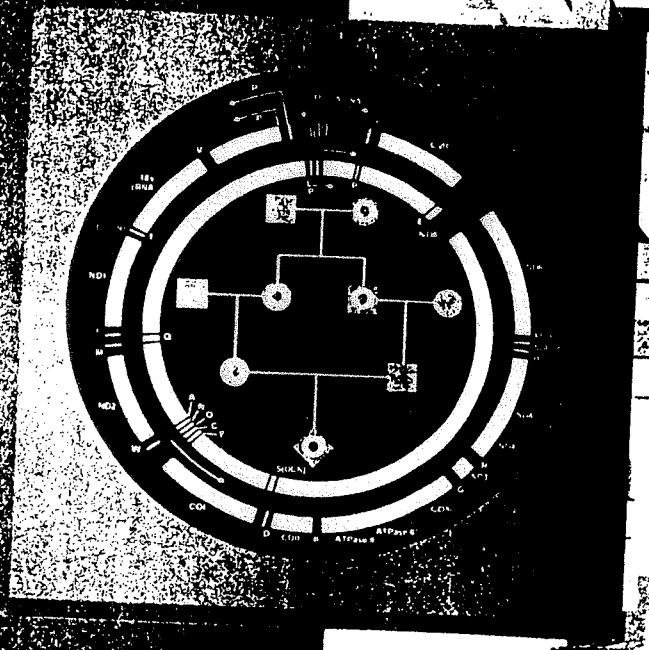

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Assemblages of children's bones in a Medieval chuchyard in Sweden - Results of epidemics, warfare, infanticide or simply, disturbed graves?

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SUMMARY

A Cristian churchyard in Sweden dated to AD 1200-1400 has been subject to new archaeological and anthropological analyses. A total number of 371 individuals were interred in Westerhus, of these 32 % died before the age of 1 and 62.5 % before 20 years of age. The high death rate of infants has been claimed not to be representative of a rural, Medieval population in the Nordic area.

Six assemblages of bones with several individuals involved have been scrutinized. The collections contain bones from 6, 10, 11, 14, 22 and 23 individuals respectively. The aim was to build up a theoretical scheme to facilitate the analysis of the bone assemblages and to answer weather or not the deaths had occured simultaneusly and/or the burials had taken place simultaneously.

The age composition and the completeness of the buried individuals were investigated. Further, the existence and amount of traces of violent trauma are compared to other temporary sites. The dating and the position of children graves in the churchyard were also accounted for. The questions raised were enlighted by the present study but seem difficult to solve without access to more information on the archaaeological excavation.

Key words: paleoanthropology, demographical crises, infant mortality, infant burials, assemblages of individuals, Medieval churchyard, Sweden.

INTRODUCTION

The Westerhus Medieval churchyard was published in 1960 by professor N-G. Gejvall. He treated archaeological as well as anthropological questions in a most enlightning way. Thus, this population has for decades served as a "model" of Medieval mortality, stature, burial customs etc of the Nordic countries. The skeletal material has been used over and over again to retrieve answers to various questions. In the cross-disciplinary research project "People of the Medieval period" the population and churchyard of Westerhus are scrutinized by us and other researchers. A certain trait of this burial place, not much debated, though, is the possible mass burials of children.

Our aim is, to construct a theoretical model that helps us to penetrate the causes of establishing the bone assemblages of children. Osteological and archaeological methods will be used to tst the model.

Obs demografiska data motbevisar att alla döda spädbarn dött samma år
EI

MATERIAL

The material under study consists of bones from six assemblages of individuals in the churchyard Westerhus. The site is located in Middle Sweden (Lat. 63o12' N., Long. 14°24'E.) and dated to the 12th and 13th century. It was presumably in use for about 200 years. The churchyard contains the skeletons of 371 individuals, foetuses included, of which 232 (62.5%) had not reached the age of 20 years at death (Gejvall 1960).

As the number of young individuals was unexpectedly high compared to other Medieval churchyards, Gejvall (1960: 38) suggested that some children have been buried in Westerhus after that the burials of adults had ceased to take place there. Could that have been the case?

Dating

The number of graves with artefacts in the churchyard is very limited and only a few can be dated more exactly. A silver coin in a grave can be dated to mid-13th century. Two other coins were found in the chapel. They belong to the periods AD 1360 - 1500 and 1340-1350 respectively (Gejvall 1960:109-110). We also want to mention the two shells of the pilgrim's scallop found in burials. One was deposited in a male and one in a female grave (graves 200a, 56). In the male grave also a lead sign of St. Martin of Tours was detected (Gejvall 1960:109, plates 28, 29). The sign is dated to the latter half of the 13th or to the 14th century.

TABLE 1. Bone datings of children from Westerhus churchyard, Sweden
(Datings from Gejvall 1968, project in 1999) (Age and sex determinations by Gejvall 1960)

Grave no	Age months/years	Sex Male/Female	Type of burial	Dating	^{14}C no
9	13-14 y	M	single burial	765 ±65 BP	St-2147
171	18-20 y	M	single burial	1010 ±65 BP	St-2144
177	9-10 y		single burial	750 ±65 BP	St-2148
E 89d	5-6 y		asssemblage	890 ±55 BP	Ua-15063
E 89g	2.5-3 y		asssemblage	860 ±55 BP	Ua-15064
To a	1.5-2 y		asssemblage	830 ±65 BP	Ua-15067
To i	6-9 m		asssemblage	945 ±70 BP	Ua-15068

Seven graves with children have been dated by means of radiometry. Their ages covering from an infant below one year up to 18-20 years. They all belong to the period of general use of the churchyard (Table 1) and, thus, contradict the above mentioned idea of Gejvall. Four of the datings regard the large bone assemblages E 89 and To. The dates of two children in E 89, out of 22, do not rule out the possibility that these have been buried simultaneously. The dates from burial To, on the other

hand, hardly suggest that the individuals have been buried at the same time. Regarding the assemblage To, Gejvall notes that these bones were not found *in situ*. But, again, we have no evidence that any of the children do not belong to the population that used the cemetery. The "mass graves" are refered to as follows 2, To, E 89, DivE, 51 - 68 and 62 - 64. Osteological data on all these burials are presented here. We will not in detail, however, in this contribution discuss the suspected differences between them.

METHODS

A theoretical scheme has been constructed to ease the analysis of the bone collections consisting of several individuals (Table 2). It is built up on the questions of simultaneous deaths, simultaneous burials or repeated burials on the same spot. The possible causes of various actions are discussed.

The basic method to enlighten this complex are comparing age distributions, the completeness of skeletons and traces of violence. Datings and the position of children's graves in the churchyard are used as well as a few other sources.

TABLE 2. Theoretical exposition regarding time of death and burial
Attempts to explain possible causes of multiple simultaneous deaths and/or burials

	SIMULTANEOUS DEATHS	RELATIVELY SIMULTANEOUS DEATHS AND/OR BURIALS	NOT SIMULTANEOUS DEATHS AND/OR BURIALS
COMPLETE SKELETONS	# warfare	# epidemics # bad harvests/starvation	# sacrifices # infanticides # SIDS (Sudden Infant Death Syndrome) # adding individuals to "open" common graves: - poor people's graves - children's burials
	SIMULTANEOUS BURIALS		
COMPLETE SKELETONS	# burials of skeletal parts after maceration		
NOT COMPLETE SKELETONS	# reburials of individuals from disturbed graves		
	SIMULTANEOUS DEATHS		
VIOLENCE YES	# warfare		# sacrifices # infantices
VIOLENCE NO			

DISCUSSION

Simultaneous deaths and/or burials

A violent attack against the habitation could be a possible cause of several deaths occurring at the same time. Another possibility of simultaneous burials would be reburials of damaged skeletons in connection with the digging of new graves in the churchyard.

Victims of armed conflicts?

In Westerhus, many adult men have injuries of violent nature (Gejvall 1960: chap. 8, Table 14). In fact, the number of casualties is much higher here than in any other parish churchyard in the Nordic area (Iregren 1995). In Table 3 all violent trauma of the crania in Westerhus are presented, healed and lethal wounds combined.

For the sake of comparison data from Medieval Lund and Late Medieval data from Lithuania are presented (Arcini 1999: 138; Jankauskas; Urbanavicius 1998). The Lund city populations take different chronological positions, while the Lithuanian samples derive from various social strata. Compared to these, the Westerhus figures are still extremely high. In Westerhus, however, no women have, cranial wounds of this nature (Table 3). No child skeleton in the bone assemblages or any other child, either, display any sign of violence in any part of the body. The children of the assemblages amount 86 individuals and the rest 124. The violence that evidently struck men of the population can, thus, not be proven to have touched the children.

TABLE 3. Skull vault trauma in the Medieval rural churchyard Westerhus and the city of Lund, Sweden and in various Late Medieval locations in Lithuania (Gejvall 1960: Chap. VIII, Tab. 14; Arcini 1999: 138, A7: tab 8:1a; Jankauskas and Urbanavicius 1998: Fig. 3).

Men Total	Lethal wounds	Healed wounds	No of cases	%	Women Total	Lethal wounds	Healed wounds	No of cases	%
WESTERHUS rural									
74	6	8	14	18.9	80			0	0
LUND city									
AD c. 990-1100			7	1.8				4	
AD c. 1100-1300			11	6.1				3	
AD c. 1300-1536			14	4.2				5	
Lund total			32	3.2				12	1.5
LITHUANIA									
rural				1.9					2.2
small town				2.5					1.2
city				6.3					1.5
nobles				7.9					0

Reburials of individuals from damaged graves?

Could the bone assemblages be the results of collecting bones from damaged old graves in connection with the digging of new graves? If that was the case, the skeletons would not be so complete as they are. In Table 4 the mean values of skeletal elements in the six children bone collections are presented. Most often many long bones were found as well as cranial parts and teeth. At least, half the number of long bones were recovered during excavation. It should also be noted that these bone elements are small skeletal parts from small children, which would be extremely difficult even for a professional grave-digger to collect and to move. According to Nordic laws a penalty should be paid if a dead was disturbed (Nilsson 1988: 175).

Regarding reburials of adult individuals, examples e.g. from the hospital churchyard of the Holy Ghost (Helgeandsholmen) in Stockholm and in Medieval Lund exist. In both cases aggregations of adult crania are found. These collections have been interpreted as reburials of saved parts from damaged graves (Dahlback 1983: 117; Arcini 1992:46).

TABLE 4. Skeletal representation of children in the bone assemblages in the Westerhus churchyard, Sweden (Elements summarised from Gejvall 1960: Table 22)

Bone assemblage no	No. of individuals	Cranial parts/ individual (max. = 3)	Long bones/ individual (max. = 12)
2	6	1.7	6.5
To	14	>0	6.9
E 89	22	2.1	8.2
DivE	23	0.7	5.5
51 - 68	11	2.5	9.2
61 - 64	10	1.7	5.5

Another type of "reburial", not further discussed here, is the burial of macerated skeletal parts in the home parish after the transportation of an individual that died in a foreign region. This was an accepted method during the Medieval period. Such a burial could, by chance, be linked in time to other deaths. A burial of this origin might be identified because of non-anatomical arrangements of the bones. The individual, further, ought to be grown-up and the cases would be few.

Table 4 shows that the collections "To" and "DivE" display fewer cranial parts than the others. As mentioned in chapter 2 regarding the To, Gejvall writes that these individuals were not found *in situ*. Hypothetically, the presence of cranial bones including jaws and teeth of children might be seen as more important indications of complete individuals/graves than the long bones.

Not simultaneous deaths and/or burials

Most deaths in a population would occur independently and, thus, single graves would be dug. An obvious exception would be deaths at delivery, which rarely can be proven in archaeological materials (Iregren 1992: Tab. 8). One possibility to create

assamblages, though, would be "adding" individuals to common graves that were clearly marked and kept "half-open". In the Medieval laws, however, there are regulations (Nilsson 1989: 175) concerning burials, their depths etc. When excavation and documentation is excellently performed the archaeologists ought to have a possibility to register if direct connections between individuals were found, or not.

Common graves for the poorest?

May the assemblages of individuals be common graves for the poorest of the population? This is not a plausible explanation, as only one adult is found among the 87 individuals in the large bone collections.

Common graves for children only?

In Table 5 the graves with children from Westerhus are divided according to the number of individuals per grave, e.g. possible "mass burials", multiple burials and single burials. It is evident, that children of all age groups, including foetuses, have been buried in their own graves. It is also clear, that the relative number of infants in multiple and "mass burials "is higher among small infants e.g. below 1 1/2 - 2 years. Further, children above the age of 8 years were never earthened in the large collections of children. These burial habits seem to correspond to the Viking Age customs where the children's ages determine the kind of burial gifts disposed (Nasstrom 1996).

TABLE 5. Number of young individuals per age group in the bone assemblages, multiple burials and single graves in the Westerhus churchyard, Sweden
(Age determinations summarised from Gejvall 1960: Table 22.)

Age group m = months y = years	Young individuals: Bone assemblages Number	%	Multiple burials Number	%	Single burials Number	%	Total number
foetus	5	71	1	14	1	14	7
0 - 3 m	8	35	8	35	7	30	23
3 - 6 m	19	42	11	24	15	33	45
6 - 9 m	22	65	8	24	4	12	34
9 - 12 m	7	64	0		4	36	11
1 - 1 1/2 y	2	33	2	33	2	33	6
1 1/2 - 2 y	5	45	4	36	2	18	11
2 - 4 y	11	33	9	27	13	39	33
4 - 7 y	6	30	4	20	10	50	20
7 - 12 y	1	4	6	26	16	70	23
12 - 20 y	0		3	16	16	84	19
Total	86	37	56	24	90	39	232

Graves established for children of all ages are found all over the churchyard. These prove, we believe, that most of the child burials were linked to their family

members, or even the members of the same sex. This is strongly indicated by the odontometrical investigation of the children (Alexandersen; Iregren MS 1999). The skeletal assemblages must have been created to meet special demands, we believe.

Sacrifices

Westerhus is, as earlier noted, a Christian churchyard. Christianity ought to have been established in this region at least since three generations (Brink 1996) when the regular burying started. The population would, thus, relay on the ethics and societal rules of any early Catholic parish in Europe.

The number of children involved in the "mass burials" is large and the individuals seem to be buried close to one another. Further, no evidence of violence is found in any part of the children's skeletons (Gejvall 1960, chap. VIII, Table 14). Lately, a collection of infants from Ashlekon has been studied by Smith and Kahila (1992). Here, mis-colourings in some teeth were fond and interpreted as signs of suffocation. This new method has not been applied to the Westerhus poulation. Though, having the high general infant mortality in mind, sacrifices of children seem highly unlikely.

Infanticides

The arguments regarding infanticide are similar to those against sacrifices. Infanticide is clearly forbidden in the Nordic laws (Mundahl 1988 cited by Iregren 1992). The only exception given concern severely handicapped children. Otherwise it was a crime and must be hidden. Congenital diseases would, however, be extremely few in any population. Further, there is a case of an adolescent with a severe illness, hydrocephaly, that has been properly taken care of in Westerhus. He survived until the age of 16-18 years (grave 128) (Gejvall 1960, chap. VIII, Table 14).

When it did happen, the age of the victims would be low - mainly newborns - as during later centuries (Persson 1996: 15) when infanticide in Sweden sometimes ocurred among unmarried parents as show by historical documents. This is not in agreement with our age composition (Table 6), where the ages cover foetuses to children 8 years of age.

The research within history as well as archaeology during later years has beyond any doubt proven the parental love and effection for the children also during earlier centuries (Karlsson 1988; Osterberg 1991; Welinder 1998). In present day societes, infanticides often have their roots in a severe economical situation, laws forbidding abortion or e.g. an extraordinarily strict social control. It should also be noted here, that the odontometrical investigations indicate that both boys and girls have been buried in the bone collections E89 and DivE (Alexandersen; Iregren 1999 MS).

TABLE 6. Age composition in the bone assemblages in the Westerhus churchyard, Sweden (Age determinations summarised from Gejvall 1960: Table 22)

	Bone assemblages					
Age interval	2	To	E 89	DivE	51 - 68	62 - 64
foetus	1	1	2	1	0	0
0 - 3 months	2	1	1	1	0	3
3 - 6 months	1	3	7	3	4	1
6 - 9 months	2	3	2	11	3	1
9-12 months	0	5	0	2	0	0
1 - 1 1/2 years	0	0	0	1	0	0
1 1/2 - 2 years	0	1	1	1	0	2
2 - 4 years	0	0	4	2	3	2
4 - 7 years	0	0	4	0	1	1
7 - 12 years	0	0	1	0	0	0
12 - 20 years	0	0	0	0	0	0
adult	0	0	0	1	0	0
Total	6	14	22	24	11	10

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Sudden Infant Death Syndrome (SIDS)

We now know that Sudden Infant Death Syndrome is not a new pehnomenon. It has with the help of church registers been proven to exist e.g. in Sweden during the 17th - 18th centuries (Persson 1996). The occurrence of SIDS is usually linked to the age interval 0 - 4 months. That age interval does not agree with the age distribution in the Westerhus sample (Table 6).

Relatively simultaneous deaths and/or burials

There are two possible causes of events striking a population, when deaths would occur rather close in time, namely periods of starvation and of epidemics.

Starvation

A possible cause of a demographical crisis might be e.g. two following years of bad harvests. It is known from historical data that repeated small harvest outcomes could give severe effects in raising the death rates. Such a disaster would strike all weak individuals of the population e.g. both infants, aged and already sick people. Instead, the age compostion in the bone assemblages of Westerhus (cf Table 6) points to victims lacking immunity as only children below the age of 8 years were hit.

Epidemic diseases

In a rural population like Westerhus most diseases would not be endemic, but would strike the population at irregular intervals. One of the pilgrim's roads to Nidaros (Trondheim, Norway) passed in the vicinity of the community. If the travellers increased the risk of spreading contagious diseases is not yet evaluated. During the period of breast feeding the infant would be protected by its mother's antibodies, however.

In some Medieval populations in Europe weaning has, by trace element analysis, been proven to occur after 9 months but before 2 years of age (Grupe 1986a; Grupe 1986b). Our trace element studies of the Westerhus population has revealed variations in weaning pattern perhaps linked to different families, different strata or ethnic groups (Iregren et al 1996). The weaning seems to have taken place during the interval 1 - 2.25 years, when the Sr/Ca-ratio increases among the infants (Iregren et al 1999 MS). Early weaning in some families would have effected the very youngest members of the society during epidemics as well as by summer diarrhea or winter infection.

An epidemic of e.g. virological causes would hit individuals who are not immune from earlier outbreaks. As only one adult is struck and instead mainly very young and young infants are buried in the assamblages this explanation seems logical. The unusual high number of foetuses found in the churchyard (cf Iregren 1995: Table 8) may also be indications of outbreaks of epidemic diseases. Miscarriages, thus, might occur during a mother's severe illness, starvation or extremely hard work during pregnancy (Lokke 1998: 172).

We do not believe the bone assemblages to be the results of plague epidemics, though, as this bacterial disease would also kill many adults of the population. This is evident in rural parishes in Denmark struck by plague in the year AD 1656. The *relative* number of deaths among children would raise, though (Historical data referred by Arcini 1999: Tables 3:7; A2 tab 3 :6; A 2: tab 3:2 p. 161).

CONCLUSIONS

The two last explanations of a high number of casualties put forward - severe starvation and epidemics - both would demand a special treatment of the dead corpses to be buried together, as the deaths would not appear exactly simultaneous. We may see the following scenario. Westerhus is situated in a Northern area with low winter temperatures and a snow cover. These circumstances would make winter burials difficult to put through. Corpses might have been kept during cold periods waiting for the burial to take place. Hypotesising contagious diseases, a quick, common burial would be preferred after thawing. In conclusion, we believe epidemics and other illnesses to be the main causes of the high infant mortality in Westerhus.

The analytical tool presented here supported by data on age distribution, completeness of skeletons and trace of violence served well in discussing the elapsed time span between cases of deaths and between cases of burials, respectively. Until we know more about child mortality and its variation in various societes and during different periods we hope the anhropological analytical approach to be fruitful in distinguishing burials established from various causes. It is also of utmost importance to combine the anthropological results with detailed archaeological data.

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