Infanticide, Child Sacrifice and Infant Mortality Rates: Direct Archaeological Evidence as Interpreted by Human Skeletal Analysis

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Introduction

High infant mortality rates, normal in all ancient and many modern societies, frequently are noted in the archaeological as well as the historical literature (e.g. Ucko 1969/70:271; cf. Miles 1984). Often the historical "evidence" is simply anecdotal (see Yudkin 1968:46 for a summary of the "literary" evidence), and direct archaeological evidence generally has been scanty. Miles (1984), following Hooper’s (1975) study of these high rates in antiquity, quotes the two most frequently noted comments on the subject from ancient Greece. The earlier is from Aristotle’s Historia Animalium (Book vii). Aristotle refers to infants in Athens of the 4th century B.C., noting that “Most are carried off before the seventh day; that is why they give the child its name [only] then, as by that time they have more confidence in its survival.” Hundreds of years later the Greek moralist Plutarch (ca. 46-ca. 120 A.D.) observed, in his Numa 12, that there was no formal mourning for children who die under 3 years. That this was later changed to 1 year suggests that survival rates may have improved. This attitude also reflects the practise of burying these Greek infants below house floors, where their souls could be reborn into the women of the same family (Becker Ms. A). The Greeks of that period believed that these individuals were not yet fully members of the community, and that the spirits of deceased infants soon would be reborn (cf. Morris 1992). Similar traditions may have been common in Iron Age and Roman Italy (see Jarva 1981, Becker In press A).

Indirect archaeological evidence on sub-adult mortality patterns during the Roman Imperial era is provided by Calza (1940:269). Calza notes that 25 of 200 inscriptions from elaborate tombs at the cemetery of the Porta di Roma nell’Isola Sacra (Rome) record the deaths of youths or infants (“infantile”). What age groups Calza placed in these categories cannot be known from his text, but a precise correlation of ages may be elicited from the data base. Since the youngest person whose name is recorded died at 8 months of age (Calza 1940:269) I infer that neonates and infants under 8 months of age were buried elsewhere. If 12.5% of the population died between 8 months and ca. 16 years, then the Roman mortality rate in general must have been quite high (cf. Becker 1994a).

Causes of Infant Deaths and Problems of Data Recovery

Included among the factors leading to high infant mortality rates are birth trauma and other perinatal problems, particularly various forms of diarrhea. Rotaviruses are perhaps the best known causes of infant diarrheas, but at least 2 other major infections produce similar symptoms and high mortality. This constellation of disorders are among the most common diseases of childhood, and potentially the most lethal. In the early 1990 rotaviruses are believed to have killed 3.5 to 4 million people (not all of them were children) throughout the world (World Bank 1993; for the mechanics of how this disease kills, and why children are so susceptible, see Glass et al. 1994).

Assuming that high infant mortality rates were common throughout most of antiquity, as in much of the modern world, one might wonder why abortifacients were so popular in the Roman world, and probably beyond. Recent studies documenting the desire for, and the general availability of, abortifacients in antiquity may be a corollary of high mortality rates. The use of abortifacients is particularly well documented in ancient texts from the Roman period (Riddle 1992), probably reflecting the significant urbanization accompanying the expanded wealth of cities within the empire (see also Carrick 1985). The desire of the urbanized Romans and other ancients to control their reproductive behaviors reflects a need to limit population growth in crowded contexts despite high infant mortality rates. Even with 50% infant mortality rates, women bearing 15 viable children would quickly stress any urban household.

Archaeologists involved in the excavation of human skeletal remains from any culture need to consider the special problem of variations in mortuary patterns within the society. Special attention needs to be directed toward locating the remains of "sub-adults". If in normal contexts half of all people born die before reaching adulthood, then where are their remains? Clearly these "young" people are under-represented in
almost all skeletal populations discussed from archaeological contexts. Studies of modern cemeteries from various parts of the industrialized world provide interesting information on age segregation of human remains.2

At one time I believed that the remains of infants were lost from archaeological contexts through normal processes of degradation, or through problems in field recovery techniques. Now a third and more probable explanation appears likely. In many cultures the bodies of perinatal and young children tend to be interred in contexts far removed from the formal cemeteries used for burials of adults (Becker in progress B).

Archaeological Evidence for High Infant Mortality

The absence of direct archaeological data, in the form of infant and juvenile skeletons, is rarely evident in published reports. Since direct archaeological evidence for high infant mortality rates is almost never recovered, what can archaeologists do to locate the remains of sub-adults? First, let us consider cases where we do have direct evidence for high mortality rates; those cases where all children and adults are buried in the same cemetery. Foraging (hunting and gathering) societies (Becker 1992) and many modern populations (Becker Ms. C) may bury most, if not all, infants randomly among the graves of the adults. As will be noted below, modern exceptions can be documented from northern Italy and probably elsewhere.

Certainly the best set of data concerning infant mortality patterns derives from the elegant work of Herring, Saunders and Boyce (1994). This team studied a cemetery in Belleville, Ontario, Canada, in use between 1821 and 1874, for which burial records provide information on 1,564 individuals. Archaeological work recovered the remains of 576 people (37%), but 55 were too fragmentary to allow an age estimation to be made. The 521 skeletons in the studied sample (33% of recorded burials) included 235 adults (defined as 16 years and older) and 286 children (defined as 15 years of age and under). Of these 286 children, 17 could be securely identified through the presence of inscribed coffin plates. The pre-adult mortality rate of 55% corresponds well with the “50%” infant mortality rate often cited in the literature, from periods as early as the Late Neolithic in France (Comode 1975) to 18th-19th century London (Schofield and Malt 1994:24). In these cases the entire population is present in statistically significant numbers. A more typical population is that described by Dawes and Magilton (1980) from Medieval York, England. The low end of the age scale for the numerous skeletons from this site appears to be at 2.5 years, strongly indicating that perinatal and other infants (up to the age of weaning?) are buried in a separate cemetery.

Herring, Saunders and Boyce (1994: 59-60) also provide precise definitions for “neonate” (between 0 and 28 days of age) and “infant” (between 28 days and 1 year of age). These clear definitions for terms commonly used to describe “age categories” are essential for all these studies if we intend to use these data for comparative purposes. Thus the 286 children (age 15 years and less) in the Belleville sample include 148 who died at under 1 year of age (52% of children; 28% of total population studied). Of these 148, 39 are neonates (26%) and 109 are infants (74%). Neonatal deaths in this population therefore represent only 7% of all “births”. Not clear is what constitutes a stillborn child, not the “fetal” age of some of these “neonates.” Their definition of “neonate” as a function of postpartum development is useful in this context, but may not reflect biological development of children born before term. Critical social factors, not evident in this Canadian archaeological context, include numbers of stillbirths, and more importantly, exactly what method was used to dispose of the remains of these stillbirths.

The data from Belleville, Ontario enabled Herring et al. (1994: 54) to examine in detail patterns of death, by gender and by season. Their findings that elevated morbidity rates appear during the summer are interpreted as possibly reflecting weaning diarrhea complex. In turn, these data may suggest an age at which weaning occurred (cf. Mogg-Cecchi et al. 1994). Note must be made that this small community enjoyed a relatively high standard of living as compared with those of the ancient world, and suffered few of the urban problems that were the subject of discussion of past authors.

Extremely important to the discussion of “infant” mortality rates are the findings of Herring (et al. 1994:60) that the remains of infants and children are not less well preserved than those of adults. This reinforces my belief that the absence of sub-adults from a skeletal population may be taken as indirect evidence that a separate burial area, or mortuary ritual, is employed for perinatal deaths.

Yudkin (1968, also quoted in Miles 1984) surveys literary notes regarding infant mortality from various post-Medieval contexts. Abundant literary references are noted that refer to sending children to the “country”. In general, these data agree with those of Steel (1975:150-5), suggesting exceptionally high infant mortality rates. However, as noted above, these statements derive from sources that can only be described as “anecdotal”. A study of the direct evidence from post-Medieval England indicates some rather interesting shifts in infant mortality patterns. Hoskins’s study (1965: 147-8) demonstrates that there appears to be a rise in births and a decline in deaths in rural England at the end of the 16th century. Infant, and presumably
maternal, mortality decline rapidly ca. 1570 and stay quite low until about 1625, but by 1677 Hoskins notes the beginnings of a climb in the infant mortality curve. This does not fall again until some time in the 19th century. Hoskins attributes the decline to better health derived from improved diet and better housing. This high survival rate for the 17th century is reflected in the rural Pennsylvania English population from after 1680 (Becker Ms. C).

Hooper's study (1975:375, from Still 1931) takes the London Bills of Mortality for 1762-71 as a direct piece of evidence for mortality patterns. These data indicate that in this urban environment 50% of the children (all live births?) died by the age of 2 years, and that by the age of 5 years this had grown to 67%. This corresponds closely with what Rousseau describes in Emile, for urban France in 1762: of all children, scarcely 1/2 reach adolescence. This may be a purely urban phenomenon in 18th century France. This high urban infant mortality rate contrasts sharply with the rate in the countryside around Philadelphia in the mid-18th century. At that time meat, cheese and grain exports from that port sustained the British empire. Rural women in this area, consuming huge quantities of these high protein products, commonly had 10 or more visible children. These children provided valuable additions to the agrarian work force. Infant mortality rates appear to have been extremely low in rural Pennsylvania during the latter half of the 18th century; perhaps as low as 10% (Becker Ms. C).

With good skeletal recovery from all contexts, carefully drawn mortality curves for perinatal and other children (e.g. Mallegni et al. 1993) enable cultural rules for the age of weaning to be easily recognized (see Moggi et al. 1994). Normal infant mortality patterns, however, should not be mistaken as indicators of human sacrifice or infanticide.

Interpreting Infant Cemeteries: Infanticide and Child Sacrifice

Even the most rudimentary burials of stillborn children or those who died very young reflect some concern for the careful disposal of the remains of a dead person, regardless of its status in the cycle of life. Considering what we now know regarding infant mortality rates, the presence of clusters of infant graves may be interpreted in less fanciful ways than previously seen in the literature (see Busby 1992, Soren et al. In press A, Becker 1992). Plague and child sacrifice appear to be traditional favorite explanations. For example, a series of medieval child burials from Pisa, which conforms to normal expected age distribution with high perinatal mortality, has been interpreted as representing "plague" victims (Mallegni et al. 1993). This normal population also includes the normal elevated mortality at the age of weaning (see Moggi-Cecchi et al. 1994). Thus a rare example of a complete, and therefore normal population has been interpreted to be an abnormal situation resulting from a catastrophic event. The ever popular theory of infant sacrifice, to explain clusters of child burials, will be discussed below.

In the 8th century B.C. the Greek poet Hesiod (Works and Days 376-8) observed that for an ancient Greek farmer "An only son preserves his father's name and keeps the fortune growing in one house; if you have two, you'll need to have more wealth and live a longer time" (in Miles 1984:34). Biezunskia-Malowist (1971, in Miles 1984:34) suggests that infanticide could aid the normal mortality pattern. As just noted, even with high infant mortality rates, abortion and infanticide were common throughout the Roman world, and appear to have been used by most societies prior to the advent of Christianity (see Watts 1989). Christian concerns for these tiny souls may have altered the mortuary programs associated with perinatal deaths, but the effect on the early European abortion or infanticide rates may never be known.

Note also should be made that high infant mortality rates tend to reduce the "sex ratio" (number of males per 100 females). Since males have a higher morbidity rate than females at all stages of development, from the moment of conception, increased infant mortality reduces the proportion of males in a population. Thus infanticide, particularly female infanticide, commonly is used when a society wishes to keep the sex ratio closer to 100. This may be the case for the medieval Italian situation described by Rowland (1982), who offers good documentation for the use of female infanticide.

Literary references to infanticide in Rome also exist in some numbers. For example, Suetonius, in his Claudius (27) describes the situation for Rome of the 2nd century A.D. In 315 the Emperor Constantine issued a law to "withhold the hands of a parent from murder", and ordered that food and clothing be issued to the parents of the newborn (Jones 1964:1043, in Miles 1984:35). Miles (1984:35) says the sale of newborn infants had become so common in Italy that by the time of Diocletian it was not forbidden (see also Hooper 1975:376; Nock 1932:322).

Garnsey (1988: 28, 64-68) discusses infanticide throughout the Greco-Roman world, noting that exposure was among the more common means of eliminating unwanted children. These children also could be adopted (note the Biblical story of Moses). Exposure certainly absolved the exposing from actually killing these children, and also produced a situation where dogs, pigs, or wild animals would process the remains.
CHILD SACRIFICE

Infant or child sacrifice (Merrifield 1987:5) is a phenomenon with wide theoretical distribution. However, like cannibalism, direct and unbiased evidence for child sacrifice is rarely documented. Direct archaeological evidence for any type of human sacrifice is not common, but some inferred examples are noted from Iron Age Italy (Becker 1993). The discovery of infants or children as offerings in Celtic burial foundations (Merrifield 1987:51-52, also 65-74) generally is believed to reflect human sacrifice. My own excavations in the lowland Maya area have revealed 2 children clearly “sacrificed” as tomb offerings (Becker In progress A). However, the presence of a small corpse does not necessarily tell us much regarding the actual cause of death. Recent technology, however, soon may enable us to identify weapons suspected as being used in drawing blood from, or killing, humans (Remington 1994; but also see Loy 1994).

Child sacrifice might be seen as a correlate of abortion and exposure, as means by which a population might be limited. Clark (1993) offers some data on abortion and also infant exposure, particularly from the early Christian literature. Most significantly, Clark (1993:48) points out that when Saint Basil (ca. 329-379), Bishop of Caesarea, writes of the abandonment of neonates (Letter 217.52, PG 32.796; see Saint Basil 1951-4) he does not use the term for baby (brephos, or even paidion), but either the term kuema (that which was conceived) or bennethên (that which was born).

In this context the study of the sacrifice of children may provide further perspective to a discussion of infant mortality. The supposedly notorious practice of child sacrifice among the ancient Cannaanites (or Phoenicians) now is being reviewed in the light of the direct evidence from the bones. Skeletal analysis is providing hard data from Phoenician infant cemeteries (tophets), in both the Levant (Seedeen 1991, Conheeney and Pipe 1991), from Phoenician colonies in other parts of the Mediterranean (Sicily, Sardinia, and now Cyprus). We also have comparative evidence for non-Phoenician infants’ cemeteries in areas beyond the Phoenician realm (Becker In process B).

Recent studies of the skeletal material from these ritual clusterings of Phoenician “sacrificial” children (tophets)suggest that they may be nothing more than special cemeteries for infants (Becker Ms. D), a phenomenon now recognized as common in other cultures of that time. These findings provide a new perspective on the cultural activities involved. Burial areas once thought to be for Phoenician “sacrificed” children may simply be rather prosaic infant cemeteries. The bones found in the containers buried in these specialized infant cemeteries often are identified by specialists as the remains of young animals, sometimes buried alone and sometimes buried together with the remains of an infant. Thus the “historical evidence” actually may reflect Israelite propaganda, a distorted and negative view that has come down to us in the Old Testament, in which the neighbors of the Israelites are described as practising these horrible customs.

Did the Hebrews bury infants in the same cemeteries as adults? In recent years archaeologists have come to identify actual tophets throughout the Phoenician world, from the Levant to Sardinia (see Maetzke 1964:302). This is not to deny the possible presence of child sacrifice among the Phoenicians, and may be reflected in the Old Testament by Abraham’s willingness to sacrifice Isaac. My intent here is to provide a possible alternative interpretation for clusters of infant burials, although a rather prosaic and unexciting interpretation.

Supporting this interpretation of the lack of skeletal evidence for infant or child sacrifice is recent linguistic evidence from Israel. Wolff (1994: 495) examines data from a tophet at Iron Age (X-IX centuries B.C.) Akhziv in Israel. This tophet appears to be the location of a series of adult cremation burials, with at least 2 child inhumations among them. Wolff’s considerations of the evidence (1994:496; see also Nadel 1992) “strongly suggest that the term ‘tophet’ refers not to a particular rite or precinct but to a structure where cremation took place.” Thus the word tophet, which derives from the Hebrew “to place on the fire”, may best relate to the Latin term ustrinum. Wolff here suggests that the Old Testament (Jer. 7.31) reference to the burning of Jerusalem’s “sons and daughters” in fact refers to all the members of the community, and not simply to children, or small children in particular. I would continue Wolff’s argument to infer that the term tophet has come to be applied to infant or neonate cemeteries, with the idea of these infants being sacrificial victims being a later, and probably incorrect, inference.

Aubet’s (1993) description of the tophet as a sacred enclosure is not in contradiction with Wolff’s suggestions. Aubet notes that the urns found in this type of “enclosure” contain the remains of human (infant?) sacrifice, including those bones of burned children from the molkh ritual. However, Aubet’s text is somewhat dated, having been written when tophets were known only from some central Mediterranean colonies of the Phoenicians. The actual cultural distribution now is much better known (Seedeen 1991). No tophet had been known from Cyprus at the time Aubet wrote the original text, and future excavations no doubt will demonstrate that tophets appear throughout the Phoenician realm.

Much has been written on tophets and infant burials among the Phoenicians, with interesting com-
parative data on infants' burials from Phoenician Spain during this period (C. Gomez-Bellard and F. Gomez-Ballard 1989); see also Olivier Foix and F. Gomez-Bellard 1989). The contents and contexts of child tombs of the late 1st-6th centuries outside the south gate at Carthage (Norman and Haeckl 1994) merit close scrutiny, as they may be a related phenomenon.

Elsewhere I had suggested (Becker, In process B) that the development of infant cemeteries in early Christian Italy might have had its origins in these Near Eastern mortuary patterns. If so, this would be one of the few cultural traits that was imported with Christianity, rather than developing from indigenous Roman mystery rites. However, equally possible is the development of early Christian infant cemeteries from Etruscan origins, perhaps as part of the worship of Erga, a minor central Italian deity of childbirth and fountains (cf. Becker Ms. A). While Rome was still a power, Christian influences in the countryside may have fused elements of a traditional goddess with early imported ideas regarding the sanctity of the newborn soul. The fusion of this idea with baptism may have had origins in an area removed from Rome during the Late Roman period, but one which clearly had its roots in the Italian tradition.

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Notes

1. Ethnographic data on perinatal burial customs can provide important insights into ancient cultural beliefs. However, information on perinatal mortality rates may be difficult to retrieve from the ethnographic literature (cf. Godden and Godden 1966) due to the slight attention directed to the subject by members of every society. A stillbirth, or the death of a tiny infant, generally is a very personal tragedy, felt most intensely by the parents. The ethnographic literature, however, is filled with brief commentaries on the customs involved in disposing of the bodies of children who die at birth, or by the age of weaning.

One of the more extensively documented ethnographic accounts relating to mortuary activities involving perinatal deaths derives from Modern India. Kelly (1975), in her study of gender ratios and female infanticide in 2 Indian states, elicited data on women's concepts of a "child." She demonstrated that children, even during the period of British-administered India, did not even register the birth of a child until it had survived its first year. Thus expectations of high infant mortality rates were reflected in the registration procedure, and probably in the patterns of burial of infants who died before they were registered.

This is reflected in the ethnographic record, that provides us with cases in which we would be unlikely to be able to determine burial rituals involving perinatals solely through archaeology. In the early 20th century in the area of Dacca, now Pakistan, a description of Hindu cremation practices (Godden and Godden 1966: 149-150) includes a brief line concerning the disposal of "babies and little children." Ideally "adults" were cremated on the banks of a river and the ossilegium (burned remains) were later consigned to the river. However, the little bodies of children were not burned, but wrapped in red cloth and placed on little flower decorated rafts which were floated on the river. Poorer people, or those not wishing to make a trip to the river, simple buried these tiny corpses. The preferred locations, if any, for such infant burials are not stated.

2. Contemporary questions and contemporary issues involved in the disposal of "perinatal" human remains are of considerable importance to American society. Two questions commonly asked today, whether directed to modern or ancient populations, are (1) when does life begin?, and (2) when do children become human? The age at which life begins is a subject of considerable debate in contemporary America. The ending by Presidential executive order of a 15 year ban on United States Federal support for research with human embryos also involved a formulation of a definition as to when an embryo becomes more than "a mass of cells" but is not yet an infant (Marshall 1994). Most of the popular discussion of this subject reflects pure emotion, with the participants disregarding their own actual behaviors relating to the normal huge numbers of spontaneously aborted fetuses. Of interest in this discussion are contemporary American state laws concerning the disposal of human remains. Laws regarding the disposal of spontaneously aborted fetal remains, stillborns, and "infants" may have to do with postpartum behaviors.

In Italy, in 1994, abortion is allowed up to the end of the 3rd month of pregnancy, only. Spontaneously aborted fetuses over the fetal age of 3 months, like stillborn or early infant deaths, must be registered, given a formal name, and provided with a formal funeral. Evidence from the city cemetery of Cremona, Italy, appears in the form of a small area reserved for infants near the northwest corner of the enclosure, next
to the perpetually maintained section reserved for British war dead (World War II). Approximately 100 graves of infants are here clustered, with the earliest dating from 1980 (an earlier special area, said to be in another part of the cemetery, was not located during this study in August of 1994). A few infants and children graves were seen among the adults throughout the cemetery, but none dating from after 1980.

Most of these infant graves are marked by simple wooden crosses. The brief texts on many of these, including one with a date of 1991 visible, had become obliterated. One marble monument, representing the last interment (ca. late 1993 or early 1994) bore no date. Other monuments are carved with stylized “breaks” (corners missing, top edges sloping sharply down to one side) representing the interruption of a young life. One of the marble monuments has an attached marble comet such as seen at Christmas in Italy (the Biblical star). This comet again represents the brief, bright passage of a young life.

While one child, Filippo Rizzi, presumably died in his first day (“giorno 1”), the few older children represented here are 7 years, 2 months, and 18 days of age. Most of the markets have a single date preceded by “N.M.” (nato morto) or simply M (morto). Perhaps there is no difference, but N.M. (e.g. Andrea Gervini N.M. 25-11-1993) may represent a still birth while M represents an infant who had taken breath, but died on the day of its birth.

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