

The traces of births

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No woman is the same as before after giving birth. That pregnancies and births can even leave traces in the dental and skeletal substance, is still little known. Through careful anthropological investigations, skeletons reveal their secrets after having been buried in the soil for several thousand years: age at death, sex, state of health and signs of illness, wear and tear caused by aging and specific stress markers are among the data that can provide valuable information on the conditions of life in prehistoric times. The link between strain through pregnancy and childbirth and the social status of prehistoric women is systematically investigated within the framework of an ERC-funded project [VAMOS](#) at the [Institute of Oriental and European Archaeology](#) of the [Austrian Academy of Sciences](#),

Not only trees, but also human bodies have ring-shaped structures that arise from periodic growth. Rings of minerals, organic components and water are formed annually in the tooth cementum, the component of the tooth that rests on the dentin at the root area of the teeth. Each year, a dark and light ring is added, which differs in structure and degree of mineralization. Thin sections through the roots of the teeth can be evaluated under the microscope. The exact age of death of a person is determined by counting the rings and adding them to the average age at which the specific tooth usually erupts. Even the season of death may be read in the thin sections, since light and dark rings can be associated with summer and winter respectively. Identifying the age at death of buried persons in prehistory is interesting for many reasons. For example, social structures can be reconstructed, life events and passages can be put into context with funerary objects, and age gaps between individuals buried together can be analysed. In addition, atypical lines in the tooth cementum can indicate life events: pregnancies significantly affect the calcium balance of the body, and fractures as well as certain diseases can be linked to the age at which they occurred by applying the method of tooth cementum analysis.

Anatomically, the pelvis is the area of the human body in which men and women differ most. After all, the female pelvis is an evolutionary compromise between two different interests. On the one hand, the complex pelvic girdle has facilitate mobility, but also cope with considerable additional weight since the development of the upright gait. On the other hand, the baby's skull must accommodate a brain as large and mature as possible. The bones of the pelvis are connected by ligaments and tendons connect the pelvis with muscles. Due to the increased physical stress of pregnancy and childbirth as well as due to hormonal changes, the connections are strained and/or relax to a certain degree – processes that lead to a modification of the skeletal substance. For instance, small bits of cartilage may break off at the attachment points of the ligaments, which results in grooves in the skeletal substance. However, not all changes in the pelvis are due to pregnancies and births. Many other bio-mechanical factors also play a role, such as body height, body mass and pelvic dimensions. For that reason, and because births are different for every woman and every child, pelvic features on skeletal material derived from archaeological contexts are not easy to evaluate.

Medical knowledge in prehistory was limited. One example is the peculiar association between the uterus/foetus and the toad, which is documented in folklore and can be traced back at least to the late Bronze Age. A ceramic figurine from Maissau, Lower Austria, dating to 1200-1100 BC, has been shaped like a toad viewed from the ventral side and is clearly recognisable as a woman from the dorsal side. The female sexual characteristics are particularly clearly and naturalistically formed. The woman-toad figurine, which was perhaps used as an amulet or votive offering in connection to pregnancies and births, can today be visited in the [Höbarth Museum Horn](#).



Ventral view, dorsal view and detail of the woman-toad figurine from Maissau, Lower Austria © Photos: Wolfgang Andraschek

Important sources for understanding motherhood in prehistory are burials of women who died whilst pregnant or giving birth. Some are excavated with the foetus still located in the pelvic area. In many societies, deaths during pregnancy and childbirth were considered untimely, 'bad deaths', for which special burial practices were foreseen. According to the current state of knowledge, about 10-15% of all women normally died from the consequences of pregnancy and childbirth. But mothers and foetuses/new-borns were not always buried together. Some religious rules, such as those described in the Lex Regia of Numa Pompilius, the Talmud or some medieval monastic rules, state that no pregnant woman was allowed to be buried before the child was cut from her body. The attempt to rescue the baby from the belly of the dying mother may have been one of the roots of the caesarean section.

Last but not least, the breastfeeding relationship between mother and child leaves traces in the body. Isotopic signatures of food and drink are embedded in all tissues of the human body. Nitrogen isotope ratios in the bone material provide information on the proportion of animal protein in the diet, and this includes breast milk. Breastfed children have elevated nitrogen levels in their tissues compared to their mothers. The average duration of breastfeeding in any given society can sometimes be assessed through the ages of breastfed and weaned children.

Burials of mothers with one or more of their children indicate the age at which women became mothers, as well as the gaps between siblings. Insights into the social status of women reveal grave goods and the labour expended in the grave construction. A detailed reconstruction of the women's life-cycle, combining anthropological and archaeological data, reveals how women were valued by the societies in which they lived before and after giving birth. Motherhood is not only a natural process, but also a cultural practice. This results in a considerable cross-cultural variability, which is subject to research with the latest bio-archaeological methods.

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(Translation: K. Rebay-Salisbury)*



Figures: Museum der Stadt Horn - [Sammlung Höbarth](#), Photos: Wolfgang Andraschek