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series ***ARCHAEOLOGICA ET ANTHROPOLOGICA***

CARPATHIAN HEARTLANDS
Studies on the prehistory and history of Transsylvania in European contexts, dedicated to Horia Ciugudean on his 60th birthday

NUCLEUL CARPATIC
Studii privind preistoria şi istoria Transilvaniei în context european, dedicate lui Horia Ciugudean la aniversarea a 60 de ani

Edited by /
Volum îngrijit de:

Nikolaus Boroffka
Gabriel Tiberiu Rustoiu
Radu Ota

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Horia Ciugudean

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FOOD AND COOKING IN THE ÚNĚTICE CULTURE

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Abstract. Food comprises an intrinsic part of our cultural profile. It encompasses everything that is important to people; it marks social differences and strengthens social bonds. Common to all people, yet it can signify very different things from table to table. In this paper I focus on food culture in Early Bronze Age Central Europe, with special reference to the classic phase of the Únětice Culture, covering the territories of modern Germany, western Poland and the Czech Republic approximately 1900-1700 B.C. While the results of recently completed isotopic analyses of diet (^{13}C,^{15}N) will be published in a separate publication, this article covers culturally-based aspects of cooking, seasoning, lipid analyses on pottery, drinking habits and sweets consumption.

Key words: Poland, Early Bronze Age, Únětice Culture, Food, vessel function.
Cuvinte cheie: Polonia, Epoca Bronzului Timpuriu, cultura Únětice, funcţionalitatea vaselor.

Theoretical background.

The type of food we eat, how we prepare the ingredients to make a certain recipe and ultimately how we consume and share it, is very telling of the actual essence of who we are and where we are from. Religion, ethnicity and dietary practices present a complex relationship. Various groups include food as a vital and inherent component of the expression of their faith, tribal membership, gender or social status. Regulations and norms governing food practices may vary from one system to the next, yet the role of food in binding a community together is fundamental to all.

The development of food habits in prehistory clearly indicates that for humans, food is more than just a mean of survival. Regardless of time or geographic location, for the vast majority of people an essential symbolic function of food is cultural identity. Beyond self-identification, this usually has a strong collective association. Italian pasta, Scottish haggis, Mexican taco or Chinese spring rolls - what one eats defines who one is, and conversely, who one is not. The appropriate use of food, the etiquette is another expression of group membership. In modern culture, a girlfriend appreciates a box of chocolates from her boyfriend, but not a cauliflower. Wine is considered an appropriate gift to a hostess - a liter of milk is not. Moreover, eating in larger groups increases

food consumption, and in many primitive societies the practise of who can dine together forms and regulates social relationships. Men may eat separately from women and children, servants may eat away from their employers, and in that perspective eating is a daily reaffirmation of cultural integrity. Foods affiliated with given culture are usually introduced during childhood[1] and in global terms are associated with security, good memories and positive emotions. Modern dietary studies indicate that the primal culturally based food habits are often the last practices people change through acculturation[2]. When people move to an area of different cultural norms, adaptation to new environment and society begins, however unlike speaking a foreign language or wearing traditional clothing, eating does not change so much and adoption of new food items takes many years. Throughout prehistory we can track for example 'prestigious foods' very often high in protein content, rare or expensive; 'body image foods' thought to influence beauty, health, sexual functions or well-being; 'sympathetic magic foods' usage of which was linked to their color or form or 'taboo foods' reserved or forbidden to certain subgroups in a given society[3]. Some authors have proposed new models to identify and understand the food habits of different cultures[4]. The majority of naturalistic theoretical models of dietary patterns in humans is based on four leading criteria: a) the frequency of food consumption, for example basic versus supplementary food items; b) 'flavor principles', that is typical for given population cooking techniques and seasoning; c) meal patterns and meal circles, understood as daily, weekly and yearly food consumption; and d) development, modifications and structural changes in food culture over long time periods. The leading principle is that foods available and selected by a given population can be ranked according to frequency, where the core foods are staples regularly included on a daily basis in a diet. Modern dietary studies show that for the majority of humans living today, these typically include complex carbohydrates, such as rice, wheat, yams, taro, potatoes etc. Secondary foods commonly but less frequently eaten (several times per week i.e.) may comprise of vegetables or meat, while peripheral alimentation is restricted to individual food preferences and generally speaking is not cultural group habit. Studies by Mintz and Schlettwein-Gsell suggest that in agrarian societies the core food is almost always served together with secondary items or fringe, to improve the taste[5]. Most starchy staples are bland and uniform in texture and flavorful substances added in small quantities encourage the consumption of the core foods as a bulk of diet. It has been hypothesized that in cultures where grain is a

[1] Pokutta, Howcroft 2012.
[2] Aikman *et alii* 2006; Drewnowski, Popkin 1997, p. 31-43.
[3] see Rozin *et alii* 1993.
[4] Rozin 1996.
[5] Mintz, Schlettwein-Gsell 2001.

core food, sources of vitamins A and C are in fact necessary, and incorporation of secondary foodstuff provides the balance. In this way, changes in food behaviors are believed to occur most often with peripheral foods and least often with core foods, but regardless of all that the complimentary foods are associated with cultural identity of any given individual providing flavor familiarity and 'memories of taste'.

On the other hand and in certain opposition to this, the impact of social anthropology with abstract models linking the function of foods with their cultural attributions can be seen (**Fig. 1**). The 'Culinary Triangle' by Claude Lévi-Strauss has been widely discussed as an abstract model of cooking methods which is independent of any particular culture. Based on linguistic studies and complex systems of oppositions between the phonemes, this model was intended to be universally applicable, although each culture may not utilize all the distinctions in the same time or way. The system of binary oppositions of 'edible'-'inedible', 'raw'-'transformed' and 'natural' versus 'civilized' has been used by many authors. Author's original thought grew into a much more complex system and over the years evolved into a tripartite model including culturally-based social, economic and aesthetic aspects of 'all'[6]. The way people eat and think about food is illustrated and encoded in their language used to describe eating-related rituals and consumables; however Lévi-Strauss's conceptual dichotomy of nature and culture has been criticized by other authors who traced back the roots of this model to ancient Greece[7]. In modern western society the concept of nature and chaos has been culturally constructed primarily in contradiction to human civilization and order as such, and therefore the universalistic aspirations of Lévi-Strauss's theory were overthrown at least in part. Cuisine and lifestyle of given populations are in fact inextricable, as demonstrated by Bourdieu's studies of the Kabyle people inhabiting northern Algeria. Their food practices revealed a complicated system of links between seasonality, cooking and gender[8]. For Berbers winter and spring were more related to the indoor female activities, very often associated with pregnancies and consumption of boiled and moist foods. Summer on the other hand was marked by dry, spicy and roasted foods cooked by men outdoors. Food function may vary culturally and each population creates categorizations which reflect their priorities.

[6] Leach 1976.
[7] Descola 1994, p. 93.
[8] Bourdieu 1990.

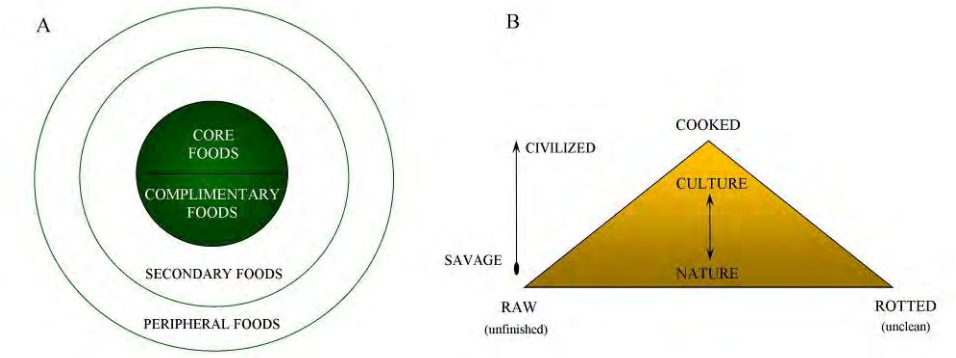

Fig. 1. Nature and culture in theory of food studies: a) naturalistic foods model; b) Lévi-Strauss's culinary triangle.

Staples.

The stability of prehistoric economy and food market depended on a surprisingly small number of plants. Cereals and other staples dominated the core of food products consumed on everyday basis and supplied a major proportion of energy. Production of grain in the Únětice culture indicates significant levels of local specialization, especially evident in the German and Bohemian territories. The most recent archaeobotanical survey of the Bronze Age sites across Europe shows that in EBA Germany we encounter agriculture primarily based on hulled barley, with emmer and spelt as secondary crops[9]. In the so-called Kościan group of the Únětice culture (Central Poland) similar patterns occurs; barley and emmer prevail, accompanied by pulses such as lentil, garden pea and bean[10]. In Silesian and Bohemian groups, however, staples were based primarily on emmer, supplemented by barley and einkorn. This can be illustrated by archaeobotanical data from barrow in Brandýs (Central Czech Republic): emmer (*Triticum dicoccum*) (63,5%), barley (*Hordeum vulgare*) (21,9%) and einkorn (*Triticum monococcum*) with 7,2%. Other plants such as spelt (*Triticum spelta*) or millet (*Panicum miliaceum*) have been found in quantities of below 5%[11].

Generally, Únětican agriculture was unfamiliar with domesticated millet and the first proven record of this plant derives from Olomouc-Slavonín

[9] Stika, Heiss 2013, p. 357-359.
[10] Müller *et alii* 2010, p. 260-264.
[11] Danielisová *et alii* 2013, p. 72-73.

and Olomouc-Řepčín a few hundred years later (3140 ± 40 BP)[12]. According to Kočár and Dreslerová the dominance of emmer in Early Bronze Age Bohemia was linked probably to better quality of soils and local ecology, and the cultivation of barley prevailed on less fertile soils[13]. Legumes were represented by lentils and peas followed by a complementary grown bean (*Vicia faba*, *Faba vulgaris*). The composition of crops shows no substantial changes compared to the Neolithic period, there are however two fundamental changes that occurred in the Early Bronze Age agriculture and shaped the volume of staples available on the global market in centuries to come. The first of them was manuring introduced on large scale, as indicated by isotopic data from Silesia[14], combined with very efficient land management and possibly new types of monoculture. One of the most prominent features of this new agronomy was ecological flexibility and the ability to adapt to changing climatic conditions. At the end of the EBA, rising importance of drought-resistant crops such as millet and lentils can be documented on many sites, and in the Late Bronze Age cultivation of these species will dominate in Slovakia[15] and Poland[16].

Grinding stones: agrarian symbolism and fertility cults.

The Bronze Age ritual and religion have played a significant role in the construction and maintenance of social relations, however in the Únětice culture this relationship between cult, everyday life and communal agricultural activities appears with a particular expressiveness. Many authors discussing issues of diet and subsistence in prehistoric societies draw attention to the fact that food habits, economy and prehistoric consumptional behaviours were governed primarily by culture[17]. The discussed populations were no exception in this field, but as we will see, the impact of Úněticean religion went much deeper, shaping the form of the society and tribal identities to a significant extent.

The highest number of saddle querns deposited in a single barrow was recorded in Szczepankowice Ia (34 items)[18], but they were also found at Łęki Małe, Bruszczewo, in flat graves at Wojkowice, Wrocław-Oporów and many other sites. What makes these findings interesting is that all of them were deliberately 'broken' and they were lacking the handstones. Intentionally 'damaged' querns for the dead bring to mind the thought that milling was of

[12] Kočár, Dreslerová 2010.
[13] Kočár, Dreslerová 2010, p. 221-222.
[14] Pokutta 2013, p. 245-247.
[15] Hajnalová 1993.
[16] Wasylikowa *et alii* 1991, p. 227.
[17] see Richards *et alii* 2003.
[18] Sarnowska 1969.

vital importance at a daily subsistence level and in consequence familiar to everyone in EBA community. These objects were linked to the processes of transformation, when one material turns into refined edibles. The deposition of querns in tombs leads us to complex issues of eschatological nature. Brück sees the grinding action of the quern, which gradually wears the stones, as a metaphor for the passage of time and the transformation from life to death as witnessed in human and agricultural lifecycles[19].

Querns appear very early in European cosmologies of the Neolithic era. Holmberg makes an interesting association between the deposition of handstones in adult graves and lower quern bases in the graves of children at the early Neolithic sites at Fågelbacken and Östra Vrå, Sweden[20]. On the other hand, in the Linear Pottery culture querns tend to be found in the graves of women and children, while at Khirokitia (Cyprus) they were deposited in graves of adult males[21]. Traditionally, grinding seems to be associated with women, in the Únětice period however, querns are found more often in male graves and in a funerary context it is males who, figuratively speaking, take over the role of *the millers*.

Úněticean religion was suspended between symbols of the harvest and fertility, the prosperity and *never-ending* circle of life, death and rebirth. It was a part of a much wider and older religious panorama of Europe and the rising Bronze Age world. The process of milling requires grain, which itself is a powerful symbol of life, death and resurrection rooted in the Neolithic period and the beginnings of agriculture in the Near East.

Seasoning, herbs and taste.

The importance of food flavour cannot be overestimated. The ways food is prepared and seasoned is second in importance only to the initial selection of basic ingredients. There are three basic categories regarding cooking techniques: a) preparation for actual cooking; the peeling, chopping, squeezing, soaking, leaching, marinating; b) cooking: defined as thermal processing of food products, i.e. baking, roasting, grilling stewing, boiling etc.; and c) preservation techniques, such as drying or fermenting. All of these techniques alter the original flavour of basic ingredients, therefore food must be seasoned. Herbs and spices played, in fact, an essential role in development of food habits in prehistory.

[19] Brück 2001, p. 155.
[20] Holmberg 2004, p. 229-230.
[21] Le Brun 2001, p. 116.

Salt, one of the most widely used seasoning, appeared already in the Neolithic and was used probably due to the high impact on human taste response[22]. New researches indicate that salt consumption in Bronze Age Europe played a very important role not only due to palatability. In the Bronze Age several methods was developed to obtain this highly valued commodity, for example, evaporation of brine by heating or insolation, when the sea water was dried by the sun in tidal ponds by the sea[23]. We encounter evidence of salt mining in quarries and 'trough' technology as well. Moreover, the use of salt expanded from food preservation, leather tanning to cloth dyeing and medicine. The number of confirmed salt production sites in Western Europe increased from 1800 B.C. In Germany large quantities of Early Bronze Age briquetage have been recorded in the Saale region and in districts of the Erdeborn, Hitzacker and Brehna[24].

In Poland salt exploitation is confirmed in two major locations: in the sub-Carpathian region, and in Central Poland (Kuiavia and Greater Poland) where natural salt springs occur[25]. In the Early Bronze Age the Carpathian zone was inhabited by populations associated with the Mierzanowice culture and salt might have been among many tradable commodities in this region.

From cultural perspective, seasoning also had another sense, strictly interlinked with prehistoric apotropaic magic. Salt, the sprig of parsley, dill or cumin added to a bowl of food may have originated as a way to safeguard the meal from evil. In the supernatural realm of Early Bronze Age Europe, sickness was caused by the actions of gods, spirits or the ghosts of ancestors. For prehistoric consumers, spices with their distinctive taste, colour or smell strengthened the *sympathetic* quality of a food, preventing illnesses, prolonging life etc.

Sarnowska enlisted approximately 40 species of plants quite likely used in Early Bronze Age Silesia, among them horseradish (*Armoracia rusticana*), cranberries (*Vaccinium oxycoccos*), sheep sorrel (*Rumex acetosella*), raspberries (*Rubus idaeus*), manna grass (*Glyceria*) or garlic (*Allium sativum*)[26]. Several herbs have been identified during recent excavations of Únětican settlements and graves, but many spices were known already in the Neolithic. In Eneolithic Bohemia houses associated with the Baden culture (c.3600-2800 B.C, Prague 9-Miškovice) revealed the presence of several herbs, such as sheep sorrel (*Rumex*

[22] Bukowski 1985, p. 44; Harding 2013, p. 49.
[23] Harding 2013, p. 54.
[24] Müller 1996; von Rauchhaupt, Schunke 2010.
[25] Jodłowski 1971.
[26] Sarnowska 1971.

acetosella), field pansy (*Viola arvensis*), Viper's bugloss (*Echium vulgare*) and elderberry (*Sambucus nigra*)[27].

Elderberry was probably linked to yeast production, which throughout prehistory has been associated with the brewing of beer and wine. Certain fruits are host to large amounts of wild yeasts on their skins, such as the grape (g. *Vitis*), and in northern Europe- the elderberry (*Sambucus nigra*). Fermenting wine or beer can be added to flour to produce leavened bread. Pliny the Elder commented on this practice in later times (*Historia Naturalis,* XVIII). Some new evidence and ceramic impressions from Ukraine indicate the presence of elderberry already in the settlements associated with the Eneolithic Cucuteni-Trypillian culture, approximately 4800-3000 B.C[28].

In fact, the sharp spicy flavour, a mixture of salted dill, horseradish and mustard seeds might have been among the most popular in Central Europe around 2000 B.C (**Fig. 2**).

Fennel (*Foeniculum vulgare*) and dill (*Anethum graveolens*).

Fennel seeds have been identified during excavation in Bruszczewo, an Únětican fortified settlement dated 2200-1700 B.C. Fennel is an antibacterial spice, and it has been studied for its ability to prevent bacterial overgrowth. In this respect, fennel shares the stage with garlic, which has also been shown to have bacteriostatic or bacteria-regulating effects and also a strong diuretic effect, useful in treating respiratory disorders and indigestion. Regardless of pleasant aroma and flavour, dill and fennel might have been used in Únětican households for baking, marinating and possibly in cosmetics.

White goosefoot *(Chenopodium album)*.

The most recent discoveries of goosefoot are based on archaeobotanical analysis of plants from the barrow at Brandýs in Central Bohemia. The excavations revealed a new 'princely grave' radiocarbon dated c. 2027 B.C[29]. From prehistory until 17th century A.D. white goosefoot was widely eaten. Young leaves and stems were eaten fresh, boiled or fried, and the seeds were ground for mush, or used as flour for bread. The plant accumulates large amounts of ascorbic acid in its tissues, making it a valuable tool for fighting scurvy. But above all white goosefoot played quite a specific role in culinary calendar 'filling up' the gap in food supplies at the end of winter and in early spring.

[27] Ernée *et alii* 2007.
[28] Kadrow 2010, p. 96-99.
[29] Danielisová *et alii* 2013.

Mustard seeds (*Sinapis*/*Brassica*).

Mustard seeds are mentioned in ancient Sanskrit writings dating back about 5000 years ago. They have been identified in the Únětican tomb at Brandýs, Czech Republic. Apart from the distinctive pungent taste, like other *Brassicas*, mustard seeds contain plentiful amounts of phytonutrients, such as glucosinolates and a significant dose of selenium and magnesium. While mustard seeds were used already in the Early Bronze Age, it seems that it was the ancient Romans who invented a paste from the ground seeds, which was probably the ancestor of our modern day mustard condiment. The use of *Brassica* in Bronze Age cooking was probably restricted to roasting and marinating/ensiling and macerating the mustard seeds in wine, vinegar or water.

Poppy seeds (*Papaver somniferum*).

Opium poppy has been identified in Bruszczewo[30] and on several Early Bronze Age sites in Southern Germany[31], but in fact this plant accompanied humans from the dawn of civilisation. Opium poppy was cultivated in lower Mesopotamia already by 3500 B.C., and Sumerian texts refer to it as *hulgil*, a *'joy plant'*[32]. Egyptian sources confirm cultivation and trade of poppy around 1300 B.C. They reportedly traded the item across the Mediterranean into Greece and Europe. It seems there was no limitation in the spread of this plant and therefore *Papaver somniferum* can be found almost in the whole of Europe. It has been reported in Greece and Bulgaria (14 sites), France, on Early Bronze Age sites in Spain and in the Carpathian Basin[33].

Garlic (*Alliaria petiolata*).

Culinary art of the Early Bronze Age inherited many basic herbs and essences from the Neolithic period. One of them was garlic (*Alliaria petiolata*). The newest evidence of phytoliths preserved in carbonised food deposits on prehistoric pottery from the western Baltic dating from 5000-4500 cal B.C., indicate the importance of this plant in cooking[34]. The garlic mustard seeds were found in pots along with terrestrial and marine animal residues which points out direct consumption and culinary use, being probably the first direct evidence for spicing of food in the European prehistoric cuisine. According to Saul *et alii* 2013, the exploitation of plants by hunter-gatherers and early agriculturalists included the criteria of taste, and this brings us closer to one of the most

[30] Müller *et alii* 2010, p. 250-287.
[31] Stika, Heiss 2013, p. 356-357.
[32] Aggrawal 1995, p. 34.
[33] Stika, Heiss 2013, p. 350-357.
[34] Saul *et alii* 2013.

forgotten research fields of modern archaeology: wonderful culinary memories for prehistoric Europe.

Fig. 2. Spices and herbs in the Early Bronze Age: a) Fennel (Foeniculum vulgare); b) White goosefoot (Chenopodium album); c) Mint (Mentha aquatica and Mentha spicata); d) Cranberries (Oxycoccus); e) Elderberries (Sambucus nigra); f) Raspberries (Rubus); g) Thyme (Thymus vulgaris); h) Sage (Salvia pratensis); i) Poppy (Papaver somniferum); j) Mustard seeds (Sinapis/Brassica); k) Horseradish (Armoracia rusticana); l) Garlic (Alliaria petiolata).

Seasonal foods, snacks and the consumption of sweets.

One of the basic features of the prehistoric cuisine was seasonality. The vast majority of edibles, such as dairy products, had to be consumed in a relatively short time. The annual cycle of farming activities and weather shaped to a significant extent the volume and quality of food available for immediate

consumption. From summer to autumn the abundance of seasonal fruits and vegetables, such as cherries (*Cerasus fruticosa*), plums (*Prunus*), peas (*Pisum sativum*) or hazelnuts (*Coryllus avellana*) generated surpluses, especially after harvests. The summer was also associated with snacking, and eating in-between meals small quantities of favourite treats. Archaeological evidence from settlements of the Únětice culture indicates at least two types of 'snack-food'. The first of them were nuts of different sorts, such as hazelnuts and beech nuts (*Fagus sylvatica*), present in Central Europe already in the Neolithic, eaten by humans on their own, roasted, salted or sweetened[35]. The consumption of nuts was important as they provide high caloric intake rich in dietary fiber, folate and vitamin E. In Silesia we encounter evidence of another Úněticean summer treat - the duck mussel (*Anodonta anatine*). Significant volumes of shells have been recorded on settlements and in waste pits nearby Wrocław. The level of breakage of shells (almost all have been opened) brings the conclusion that this aquatic animal was a popular type of food[36]. Freshwater mussels nowadays are generally considered to be unpalatable, although the native peoples in North America ate them extensively.

The dentition and volume of cavities recorded in Early Bronze Age Central Europe leaves no doubts as to increased consumption of sweets, and helps to identify major sources of carbohydrates in Úněticean diet: a) porridge, flour and similar plant products; b) beer or alcoholic beverages, such as apple cider, light fruit wines; c) fruits, as the main source of fructose; d) honey and honey-based treats; e) milk (to a lesser extent).

Apiculture and honey production in Bronze Age Europe are heavily understudied. In the prehistoric European woodlands bees were kept probably in specially hollowed trees, and iconographic evidence from epi-Palaeolithic Spain shows that smoke might have been used to keep them calm, while the honey was extracted (**Fig. 3**). Moreover, the depictions found in Niuserre tomb at Abu Gurob show the bee-keepers blowing smoke into hives as they are removing the honey-combs[37]. The presence of beekeepers resulted in the availability of other products such as waxes used in the strengthening of ropes and as natural lubricating oils, or honey based medications. In the Bronze Age Mediterranean honey production was an important part of economy, and beekeeping was highly specialized and probably an hereditary occupation, requiring manual skills and years of training.

[35] Sarnowska 1971, p. 101, Kadrow 2010.
[36] probably seasonal; Pokutta 2013, p. 93-94.
[37] Nicholson, Shaw 1995, p. 409.

Fig. 3. Left: Malia bees pendant made of gold, dated to Protopalatial period (1800-1700 B.C), Crete; Right: the extraction of honey in the Late Palaeolithic (c. 8000- 6000 B.C), petroglyph from the cave de la Araña in Bicorp, Spain.

Milk, soups and stews - food residues and lipid analyses.

In recent years, considerable progress has been made in retrieval and analysis of food residues deriving from sites associated with the Únětice culture. Food residues in the vessels have been discovered in fortified settlement of Bruszczewo in Central Poland (**Fig. 4**). Interestingly, Bruszczewo also provided evidence for the storage of food in disposable containers, and production of cups and kits made of tree bark.[38]

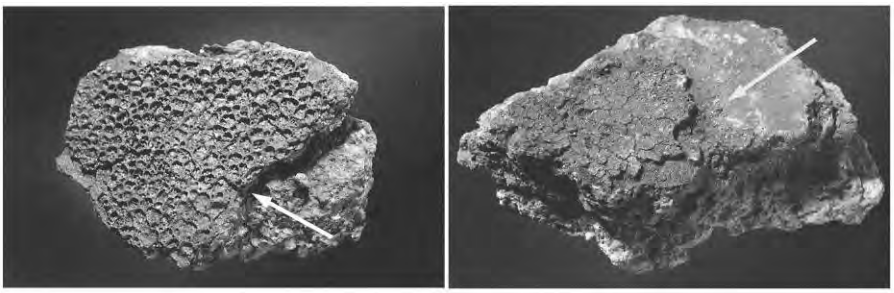

Fig. 4. Food residues found on ceramics, Únětice culture, fortified settlement of Bruszczewo, Greater Poland; after Müller *et alii* 2010 with modifications.

[38] Müller *et alii* 2010.

In 2011 organic residue analysis of the fine-ware ceramic vessel found in the barrow at Kąty Wrocławskie in Silesia, SW Poland, revealed the actual content of the meal offered to the deceased interred in the tomb. Radiocarbon dating of human remains indicated 1858 B.C. and the classic phase of the Únětice culture. A fine-ware, carinated jug with a flared rim tempered with mica was decorated with five horizontal grooves above the carination (**Fig. 5**). Unglazed pottery adsorbs lipids (fats, waxes and resins) from foodstuff or other organic material that has been stored or prepared in them[39], thus providing information on the last few uses of a vessel[40]. It should, however, be mentioned that the forming of lipid residues is a complex process making it difficult to trace the exact 'ingredients' and the 'chronological' sequence in which the content was kept in a vessel. Fat-rich products will leave stronger signals while they may not have been the main ingredient.

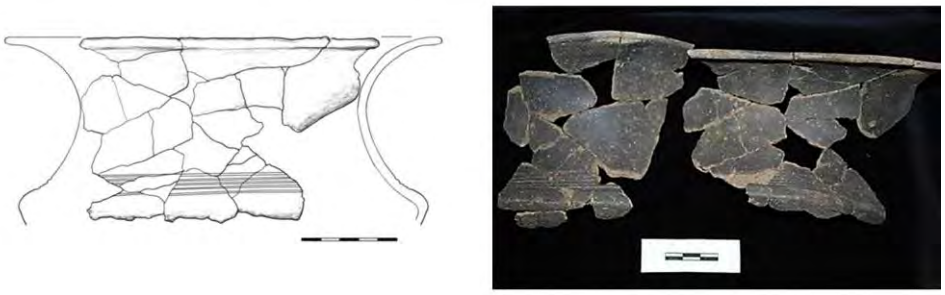

Fig. 5. Vessel found in the barrow at Kąty Wrocławskie, Silesia; size: 22 cm high, diameter c. 25 cm, decorated with horizontal grooves, Únětice culture, classic phase: 1855 cal B.C; drawing: J. Baron, photo: D. Pokutta.

The lipid content of the vessel in question was high, circa 630 µg/g. The ratio C18:0/C16:0 was 1.11 indicating fats of animal origin. Terrestrial animals generally have a higher amount of stearic acid (C18:0) compared to palmitic acid (C16:0). Thus, if the ratio C18:0/C16:0 is high, the origin is likely from terrestrial animals, and reversely, if it is low the origin is likely to be plants or fish[41]. Cholesterol was also present, underlining this interpretation. Furthermore the ratio $C17{:}0_{branched}/C18{:}0_{straight}$ indicated a ruminant origin even if no intact triacylglycerols were present[42]. Ruminant fats (both adipose tissue and milk fats) contain more branched fatty acids as well as more fatty acids with an uneven

[39] Evershed 2008, Evershed *et alii* 2001.
[40] Craig *et alii* 2004.
[41] Olsson, Isaksson 2008.
[42] Hjulström *et alii* 2008.

amount of carbon atoms, compared to other terrestrial animals. This is due to bacterial activities in the animals' intestines and stomachs[43]. The main part of organic residues is free fatty acids that have been hydrolysed from triacylglycerols (TAG). TAG is the bulk part of what is normally referred to as fats and oils. Sometimes intact TAG is present in well-preserved prehistoric pottery. A wide distribution of TAG (40-54 carbons in the acyl-part, compared to 46-54) indicates ruminant fat, as ruminants produce more short-chained compounds. If the amount of the shortest of these (40-44) is high, it indicates fat derived from milk. However, the short-chained TAG decomposes faster than the longer, so a sample with a narrower distribution may still be of ruminant origin. Moreover, the discussed vessel contained plant waxes and the presence of phytosterol and long-chained alkanols have been confirmed[44]. The surface also revealed traces of 3,7,11,15-tetramethylhexadecanoic acid (3,7,11,15-TMHD). This is formed by oxidization of phytol, derived from chlorophyll, which is produced both by plants and photosynthesizing micro-organisms and plankton[45]. The gathered information sheds a new light upon the content of the vessels found in Úněticean 'princely graves', which in the case of the barrow at Kąty Wrocławskie consisted of milk (or its derivates: butter milk, cottage cheese etc.) and greens containing chlorophyll, possibly vegetables, and the presence of meat (ruminant fats) cannot be excluded[46].

Edible and inedible - disgust and food avoidance.

Food selection in prehistory was primarily motivated by availability and taste. Eating choices were typically made according to what was obtainable, what was acceptable and what was preferred. Local ecological conditions, such as climate, weather, soil or native animal population, shaped the food supply at the fundamental level, but seasonal variations were probably also a factor along with unusual climatic events such as drought or floods, that could disrupt the food supply. The dietary domain for any given prehistoric population was generally limited to several food categories: a) inedible foods, b) edible by animals but not by humans, c) edible by humans but not by community/tribe, d) edible by humans but not by me, and finally e) edible by me. Foods defined as inedible vary culturally. This group comprises actually poisonous products as well as harmless food items not eaten because of repulsive look, strong beliefs or taboos. It may include, for example, animals dangerous to catch or animals that have died due to unknown reasons or disease, animals that consume garbage or

[43] Christie 1981.
[44] Charters *et alii* 1997.
[45] Olsson, Isaksson 2008.
[46] see Pokutta *et alii* 2012a.

excrements and so on. The second group is also highly variable, and consists of foodstuff thought to be 'inappropriate' for humans, i.e. the consumption of rats in a modern western example. The third category encapsulates the sense of tribal identity because it comprises foods that were recognized as acceptable in some societies, but not in one's own culture. In some parts of Eastern Africa consumers are disgusted by eggs which are in their opinion associated with excrements[47]. Some South Africans, who consider ants and termites a delicacy, are repulsed by the idea of eating scorpions, a specialty enjoyed by some Chinese. Certain products might have been excluded also due to gustatory preferences of prehistoric consumers, based on religion, expense or sympathy. Archaeological evidence from Wojkowice in Silesia and Brandýs in the Czech Republic indicate clearly that dog flesh was rather not 'on menu'. Dogs were kept for company and treated as certain 'investment' (e.g. sheep farming, hunting) rather than as potential source of food. The dog had accompanied his owner in a 'princely grave' (Brandýs), but canine remains are more frequently associated with the graves of children[48]. The individual food choice model was in fact the base for more complex behaviours, governed primarily by social ranking, identity and cult.

Meat, roses and feasting.

In many cultures 'special' dishes that include costly ingredients or time-consuming preparation are characteristic of feasting. The main goal of the feasts was to redistribute food from rich to poor providing alimentary balance for the whole population, to demonstrate status or to motivate people toward common goals. Food as entertainment and vicarious enjoyment of eating marked the seasons and life-cycle events, often associated with religious rituals (e.g. vernal/autumnal equinox or winter solstice). It may be, however, difficult to differentiate regular consumptional wastes from those attributed to feasting. Haden proposed certain solutions, arguing that apart from food remains and residues, a 'proper' prehistoric feast required constructed facilities (large houses or other tangible traces of architectural arrangements) and was likely limited to certain occasions and locations (e.g. barrow inhumations)[49]. In the Únětice culture the best examples of feasting rituals derive from barrows of the so-called Kościan group in Łęki Małe (Central Poland) and the tombs in Szczepankowice (Silesia); however, it seem likely that the erection of many other monuments was celebrated with cooking on grand scale and ceremonial banquets. Some authors

[47] Rozin 2002.
[48] Pokutta 2013, Danielisová 2013.
[49] Haden 2001.

stress that butchering of large domestic animals in agricultural societies was often reserved for special occasions, and ritual banquets were the means by which political status of elites and social order had been negotiated and transformed[50]. There is no data to assess the quality of the products served at the time of the funerals, however, the volume of food sacrificed for the dead is truly remarkable. It can be illustrated by the smallest among all the monuments, barrow no I at Łęki Małe. Inside of the monument nine animal bone deposits were found, located in more or less equal distances from the centre of the barrow (depth of 4,10-4,20 m)[51]. They have been identified as remains of several ceremonial banquets that took place simultaneously during the funeral and backfilling of the tomb. They represent the remains of 7 horses, 7 cows and at least 3 pigs and 2 sheeps, making a total equivalent of over 6800 kg of meat[52]. The volume of animal bones retrieved from the largest and the oldest tomb (no 4, 6 m high, 50 m diameter) significantly exceeds quantities found in other barrows, including the data provided above. All barrows carried traces of cooking *in situ* (probably roasting) and bonfires.

The social function of shared meals might have been important, however, in barrows of the Silesian group we encounter exotic foods, which undoubtedly were not consumed on a day-to-day basis. The remains of great bustard (*Tarda otis*) were found in barrow Ia at Szczepankowice, nearby Wrocław[53]. Sympathy or devotion was manifested in many other ways as well. The analysis of plant macroremains from the infilling of the barrow in Brandýs revealed the presence of roses used during funeral ceremonies in Bohemia[54].

This evidence indicates a specific dichotomy in respect of the social position of tribal elite ‘forced’ to distribute large volumes of food to people on the one hand, while certain goods remained reserved for only some individuals on the other. This process can be understood as rising 'consumer sovereignty', fundamentally shaped by an economy in which Early Bronze Age consumers became members of complex and larger tribal organizations, together with their families, clans and local communities. This new social arrangement was subjected to many influences from social institutions, forming the foundations of the power of ‘elite’ buried in ‘princely graves’.

[50] Pearson 2003, p. 10.
[51] Kowiańska-Piaszykowa 2008, p. 67.
[52] Kowiańska-Piaszykowa 2008, p. 67-68, 74, 218.
[53] Sarnowska 1969, Pokutta, Frei 2011, Pokutta 2013, p. 90.
[54] Danielisová 2013, p. 68.

Etiquette.

Despite the fact that the majority of food in prehistory was eaten with hands and spoons, it would be wrong to think that etiquette had not existed. Rules for 'correct' behaviour and appearance, especially during social gatherings, have a long tradition. The design of prehistoric 'everyday things' covers not only a broad spectrum of how an artefact worked but also if it was 'approved' by society or simply the most common manner it was used/misused. Some evidence indicates that certain types of amphorae in the Únětice culture were worn on the heads[55]. One such vessel has been discovered at the bottom of the Oder river in Kamieniec Wrocławski in 1971. The vessel was 38 cm high, grey in colour with a base 12 cm in diameter and a rim of 15,5 cm. The material used for production was fine clay tempered with mica, technologically typical for the Únětice culture[56]. Interestingly, the amphora was equipped with three vertical handles and a concave bottom designed to be carried on the head (with some organic pad for comfort perhaps). It weighted 4,8 kg providing almost perfect counter balance for the human head during transportation[57]. Another interesting issue is the asymmetry of obliquely formed rims (**Fig. 6**). The Únětice culture pottery making tradition was unfamiliar with certain elements of design, such as spouts (e.g. in jugs). Undoubtedly, the quality of ceramics varied and some pots were not free from defects, however, obliquely formed mouths indicate deliberate attempts to modify the static and heeling angle of the vessel, to prevent it, for example, from dripping when pouring liquid/loose products.

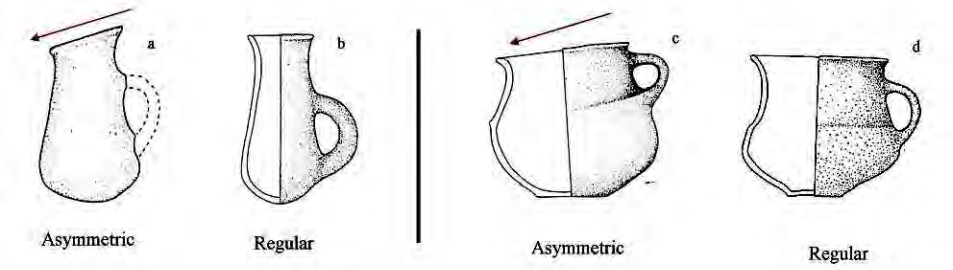

Fig. 6. Pouring without spilling: some Úněticean vessels indicate deliberate attempts to create an asymmetric heeling angle; from the right: jugs: Weißenfels (Zich 1996, tab. 14C) and Salzmünde (Zich 1996, tab. 15C2); pots: Kötzschen (Zich 1996, tab.37 H) and Oschersleben (Zich 1996, tab.28).

[55] type 12B according to Zich 1996, tab.72.
[56] Sarnowska 1971, p. 94-96.
[57] see analogies: Zich 1996, tab. 8c, 12a, 14f, 16d.

Even a brief overview of the range and shapes of Únětican pottery provides information on the manner of cooking, storage and serving. The sizes of vessels vary from miniature cups, lids, bowls and epergnes, strainers to huge storage amphorae and barrel-shape containers. That indicates highly developed and structuralized food technology and food culture. Únětican ceramics were the subject of interest to many scholars and it is not my intention to summarize the magnitude of the work devoted to this issue[58]. Instead, here I would wish to have a closer look at the subcategory of mugs and human-related drinking behaviours.

Únětican mug - toasts and drinking salutations.

The deliberate creation of drinkable alcohol is thought to date back roughly ten thousand years, and most of the ancient world was very familiar with alcoholic drinks[59]. Beer without hops and drinks made from honey ('mead') are likely to have been the first alcoholic beverages, but other drinks were quickly discovered and produced from whatever was locally available. The invention of beer predates considerably the advent of the Sumerians in Mesopotamia, and this fact has even been discussed as a possible motive for a much earlier development of human culture and the so-called "Neolithic Revolution" in this region. Braidwood argued that it was the discovery of the intoxicating effect of the alcohol contained in beer, rather than the use of grain for other foodstuffs, that caused the transition from hunting and gathering to living in stable settlements[60]. According to him alcoholic beverages might have been in use around 7000 B.C. in the border territory of the alluvial plain of Mesopotamia. In Europe the use of this new invention might have been 'delayed' however, and according to Sherratt broader consumption of beer was linked to later phases of the Neolithic. According to him production was not really possible before the 'secondary products revolution' and in fact many European plants did not contain enough sugars or yeasts for fermentation to take place[61]. We encounter the first physical evidence of drinking in the Early Bronze Age. One examples comes from Scottish Ashgrove, where the remains of honey, ribwort, meadowsweet and mint have been identified inside a vessel[62]. Regardless of the various possible interpretations, some authors see that as

[58] Moucha 1963; Sarnowska 1969; Machnik 1987; Zich 1996; Lasak 1996; Bartelheim 1998; Kneisel, Schiltz 2004.
[59] Austin 1985, Ferme Ghaliounqui 1979.
[60] Braidwood *et alii* 1953.
[61] Sherratt 1987.
[62] Dicksons 2000, p. 79-80.

evidence of mead or ale[63]. Another well-attested evidence derives from Middle Bronze Age Denmark, where in Egtved the organic bucket contained pollen of meadowsweet, clover, bog myrtle mixed with wheat and cranberry (yeasts)[64].

What made Únětican lifestyle unique perhaps was not the quality or formula of alcoholic beverages, but the institutionalization of drinking embedded in a variety of ceramic forms designed for this purpose. Toasts, the ritual of raising glasses during collective consumption, is probably one of the oldest and most common European traditions associated with expression of good will and hospitality. Alcohol has been a topic frequently mentioned in the Odyssey. Athena used alcohol, in this case to distract the many suitors and allow Telemachus to have a secret escape[65], Calypso got Hermes drunk with wine[66], Zeus' daughter Helen mixed alcohol with narcotics[67] and Odysseus brought a skin of extremely strong wine to the Cyclops, just to mention a few examples. Regardless, it is difficult to say when the custom of raising vessels during feasts appeared exactly, but indirect evidence points out the Late Bronze Age. The specific shape of Únětican mugs of the classic phase with small handles, asymmetrically and vertically located in the lower parts of the body required unusual skills to grab/hold it, which it is shown in **Fig. 7**.

In this case we can track the way vessels had to be held by users: with their index fingers securing the handle and thumbs most likely upwards to keep stability. From the biomechanic perspective, the 'Únětican grip' in fact physically prevented drinkers from raising vessel too high, especially with liquid content inside. It is therefore possible that people of the Únětice culture were not familiar with such a form of drinking salutations.

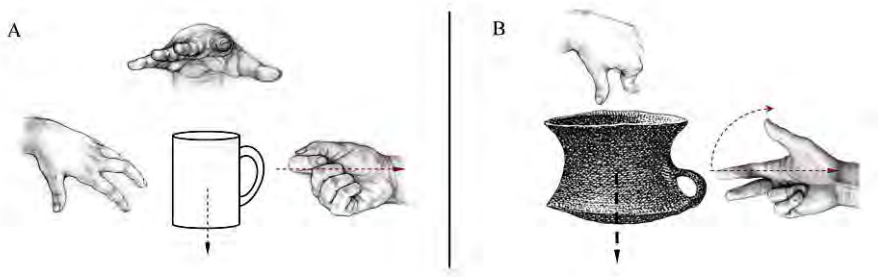

Fig. 7. The biomechanics of the hand during drinking; A) modern grip of a mug; B) Uneticean mug.

[63] see further references in Pearson 2003, p. 20.
[64] Pearson 2003, p. 20; Dicksons 2000, p. 80-81.
[65] Homer, Odyssey 7.105.
[66] Homer, Odyssey 7.155.
[67] Homer, Odyssey 7.133.

Conclusions.

Despite the fact that the greater part of ingredients, such as dairy products or alcoholic drinks, were known already in the Neolithic, food technology of the Bronze Age changed significantly due to three great transformations. Increasing salt consumption resulted in the development of more sophisticated food preservation techniques available to a broader group of customers. Secondly, change was interlinked to the spread of bronze production. The first use of cooking facilities dates back to Pthe alaeolithic (approx. 23 000 B.C) and in Central Europe ovens have been discovered at Dolní Věstonice in the Czech Republic[68]. However thermal processing of food, especially roasting and cooking, were a lot easier in the Bronze Age due to more efficient use of fuel and ovens. Metallurgy and smelting required advanced knowledge regarding temperatures, appropriate fuel and timing; certain parts of these technical innovations have been creatively adapted also in kitchens. Alcoholic beverages, such as mead, beer, fruit wines and ciders were introduced during the Neolithic. During the Bronze Age evidence indicates institutionalized consumption, extended the range of products associated with drinking (e.g. vessel type vs. capacity), and complex social norms and rituals. Large ceramic vessels discovered on many sites of the Únětice culture, as well as other storage facilities, were linked to a growing need to accumulate food surpluses and breaking out of the overbearing grip of seasonal availability. Some items, e.g. grinding stones, evolved culturally and were associated with concepts of power, leadership and fertility cults[69]. Today, dozens of querns deposited in Úněticean barrows bring to mind the universal message, that lack of food was deadlier than any weapon man ever made.

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[68] Zvelebil 1994.
[69] Sarnowska 1969, Pokutta 2013.

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