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BEYOND POTTERY KILNS

ABSTRACT

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There are 48 settlements containing the remains of pottery workshops from the area of the Przeworsk culture. It was here, from the end of the 2nd to the third quarter of the 5th century AD, that the wheel-made grey pottery was produced. As many as 13 of these sites were discovered in the Vistula valley, east of Kraków, in a settlement zone characterized by well-developed agriculture and non-agricultural production. The most important is the settlement in Zofipole, which provided the most valuable archaeological sources for the discussed topic.

This article attempts to explain the reasons for placing, in the chambers of pottery kilns, items that are agricultural tools or artifacts associated with bronze workshops. Intentionally buried objects are a material illustration of the perception of fire as a powerful transformational force, both in the physical and symbolic aspect. They also reveal unspecified forms of cooperation between farmers and craftsmen, and the latter with each other, including potters and bronze workers.

Keywords: Roman Period, Przeworsk culture, Zofipole settlement, pottery kilns, offerings
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INTRODUCTION

The most frequently discovered archaeological object indicating where pottery was made is the pottery kiln. Other parts of pottery workshops, such as cavities for storing or purifying clay, ceramics dryers or depots, as well as pottery tools, are rarely disclosed. From the area of *Barbaricum*, between the Rhine, the Don, the Baltic Sea and the Danube,

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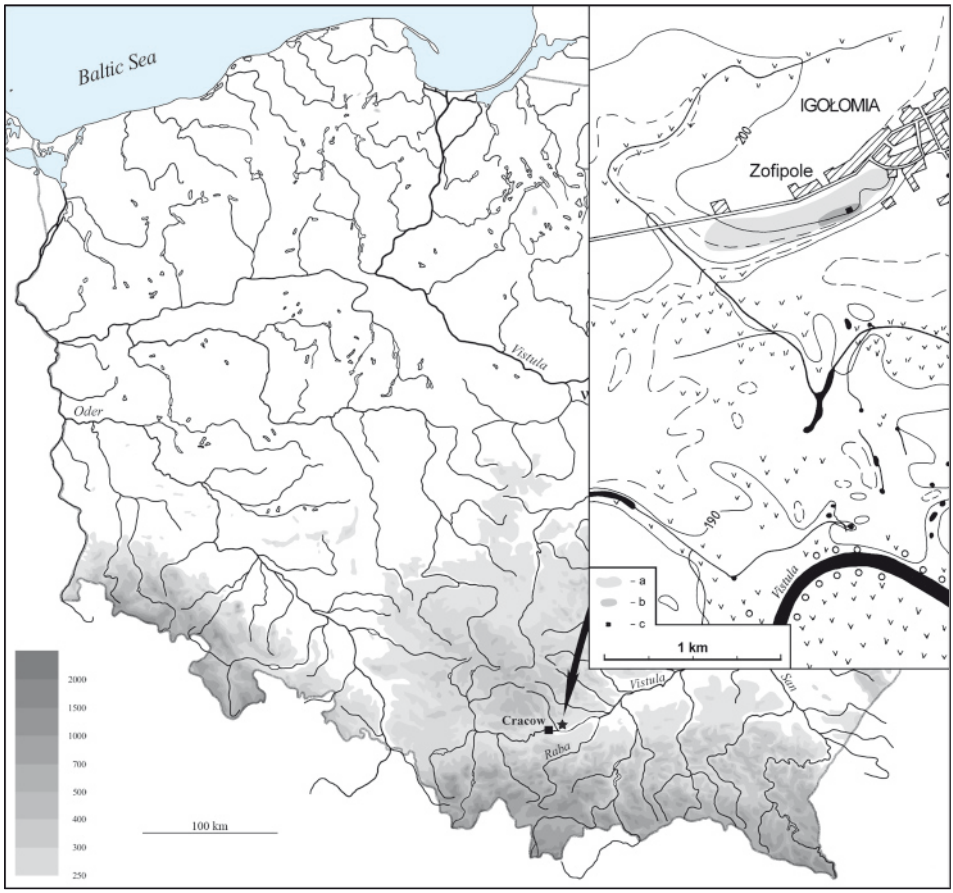

Fig. 1. Location of site 1 at Zofipole, Igołomia-Wawrzeńczyce commune, Małopolska province. a – distribution of archaelogical material on the surface, b – production area of the settlement, c – Archaeological Reserve. Drawn by I. Jordan

we know of about 220 archaeological sites with remains of pottery workshops where, from the 2nd to the 5th century AD, wheel-made grey pottery was manufactured. Of these sites, as many as 48 come from the Przeworsk culture.

The objective of the archaeological examinations of the kilns used for firing ceramics is to get to know their construction, and also to obtain ceramic materials that are production waste, which in turn indicate the type of vessels produced. The other artifacts that accompany them are very rarely perceived in terms of their use as chronological indicators for the examined objects. The presence of other materials discovered in the kiln fills does not arouse any special interest, the reason being the frequent perception of the kiln, by archaeologists, as merely a garbage dump. Also, there is a lack of detailed observations regarding

the way the kiln and its stoke-hole fill up. Because of this, it is worth asking whether all items discovered in the kilns are there – either accidentally or intentionally – as objects thrown out because of their destruction or wear. If not, it is necessary to consider the reason for their presence in the firing chambers of pottery kilns. An attempt to clarify this issue is made in this article.

The data needed to carry out research on this subject come from objects discovered in the zone of intense settlement of the Przeworsk culture population, east of Kraków.

PRODUCTION OF POTTERY IN THE VISTULA VALLEY

We know of about 190 kilns from the area of the Przeworsk culture. As many as 138 of them were found on the 13 sites archaeologically examined in the settlement zone on the loess terrace of the left bank of the Vistula, located about 30 km east of Kraków. Individual objects were also discovered on the floodplain of the river. It should be emphasized that in

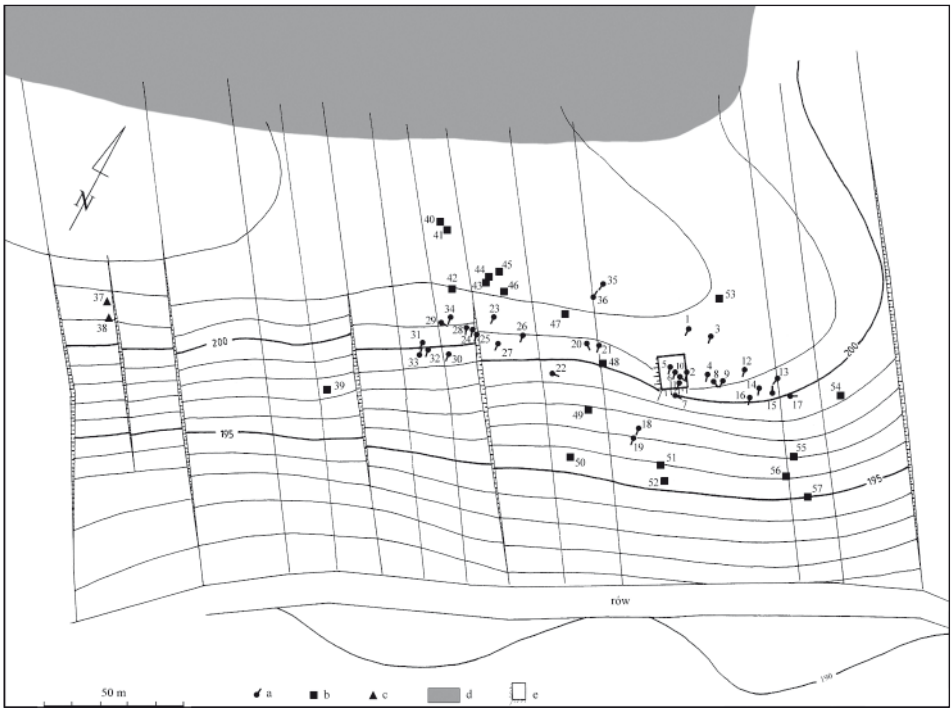

Fig. 2. Zofipole, site 1. Distribution of pottery kilns: a – excavated kilns; b – kilns, known only by geophysical prospection, not excavated; c – kilns, identified as a result of archaeological survey; d – residential area; e – Archaeological Reserve. Drawn by I. Jordan, J. Ożóg

the Vistula valley, evidence of the production of wheel-made grey pottery has been found in almost every settlement (Dobrzańska 2013, fig. 2, table 1). In the discussed zone, 4 centers with numerous kilns (from 14 to 57) were in Zofipole, site 1; in Kraków-Pleszów, sites 17-20; in Kraków-Mogiła, site 59; and in Igołomia, site 1, which functioned from the end of the second century to the third quarter of the 4th century AD. Among these, the production center in Zofipole, where 57 pottery kilns were discovered,36 of which were excavated, deserves special attention (Fig. 1.2).

The ceramic workshops form the production zone of the settlement and are located in the area of the loess edge of the terrace. They co-exist with the remains of workshops of bronze-workers, who produced gold ornaments. Craftsmen producing items using fire were working in this zone. These ceramics were produced in Zofipole for approx. 180 years. The oldest kilns date back to the beginning of the 3rd century AD; the youngest to the third quarter of the 4th century AD. The location of production enabled easy access to raw materials, such as river overbank flooding deposits and wood, in both cases coming from the Vistula flood plain (Dobrzańska and Kalicki 2004, 119, 120, fig. 4). The production area, located at the edge of the terrace, was separated from the residential part of the settlement, located on its flattening (Fig. 2).

Agriculture was the basic source of income for the population living on the Vistula River and its valley. The location of settlements on the border of two different ecosystems – loess terraces with fertile soils, and river floodplains with rich vegetation, especially forests – was favorable to the cultivation of land, animal breeding, hunting, fishing, gathering herbs, etc. (Dobrzańska and Kalicki 2004, 115-122).

Pottery kilns

All archaeologically examined kilns in Zofipole (36) are categorized as updraft kilns. They are vertical and double-chambered, and are built on a circular plan. This type of kiln was already known in Europe in the Eneolithic period. In the La Tène, Roman, and Migration periods, it is associated with the specialized production of wheel-made ceramics.

Both the poor state of preservation of the majority of kilns found in Zofipole, as well as the deficiencies in the documentation of old research on kilns, render a detailed description of the structures of all examined objects impossible. However, it can be concluded that at least 13 of them were almost completely sunken in the loess substrate (Fig. 3). The opposite of such a construction type are objects with an upper firing chamber built of clay on a wooden frame in the form of a basket. These were only partially sunken in the ground. In the case of as many as 16 kilns, the structure of which can be more precisely determined, the presence of a wall dividing the lower chamber and passing into the fire tunnel was found (Fig. 4 a).

The round oven floors, with diameters from 142 to 160 cm, indicate there were small differences in the size of the kilns. They were made from clay inside of the kilns, on a board

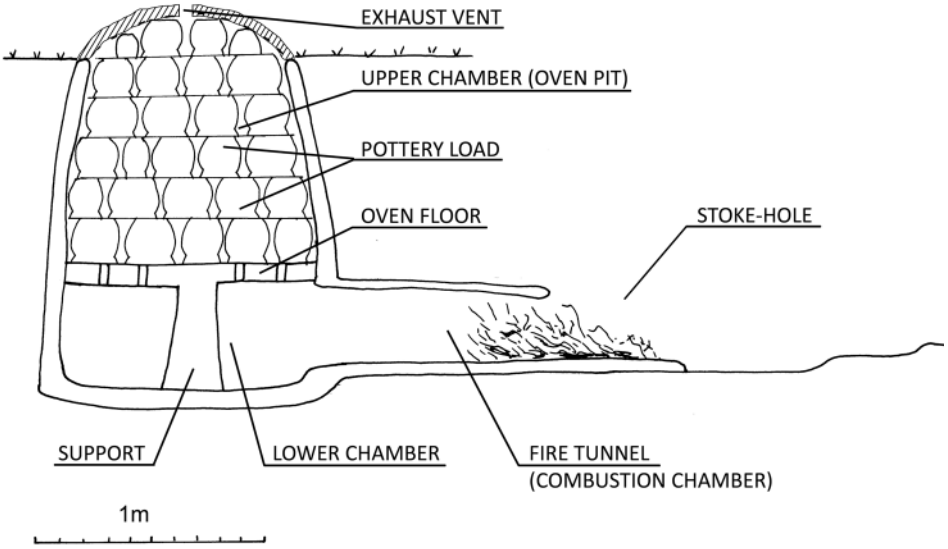

Fig. 3. Components of sunken pottery kiln. After V. Swan 1984, fig. II/IV completed, modified by J. Ożóg

made of wood and branches. The oven floors of kilns with upper chambers built on a wooden frame could be repaired, which prolonged their useful life. Ethnographic observations show that the oven floors of kilns with both chambers sunk into the ground could not be repaired. In such cases, the destruction of the oven floor, as a result of its burning, meant the end of use of the kiln. The grey ceramics from the Kraków region were. Both laboratory and experimental results indicate low firing temperatures, around 700°C (Dušek *et al.* 1986, 59-63; Goerlich *et al.* 2005).

The results of laboratory analyses of samples taken from the fills of two pottery kilns, which indicate a high homogeneity of these fills, are of significant importance for the issue discussed here. They give credence to the assumption that the chambers and fire tunnels were buried soon after the use of the kiln was discontinued (Dobrzańska 2008, 185; 2011, 264).

In the updraft kiln, "...the heat moves upward from the firebox (fire tunnel) through the setting and then is vented outward..." (Rice 1987, 159). The use of a perforated platform (oven floor) enabled the separation of the fuel from vessels, and as a consequence, also their separation from the direct flame and facilitated the distribution of the temperature in the kiln. Adjusting the air supply, and consequently also controlling the fire, made it possible to regulate the time and temperature of firing (Gheorghiu 2007, 32-33). It's worth mentioning that among the unfavorable features of a vertical draft kiln is the difficulty in balancing the temperature of firing in its upper chamber. As noted by M. Cardew,

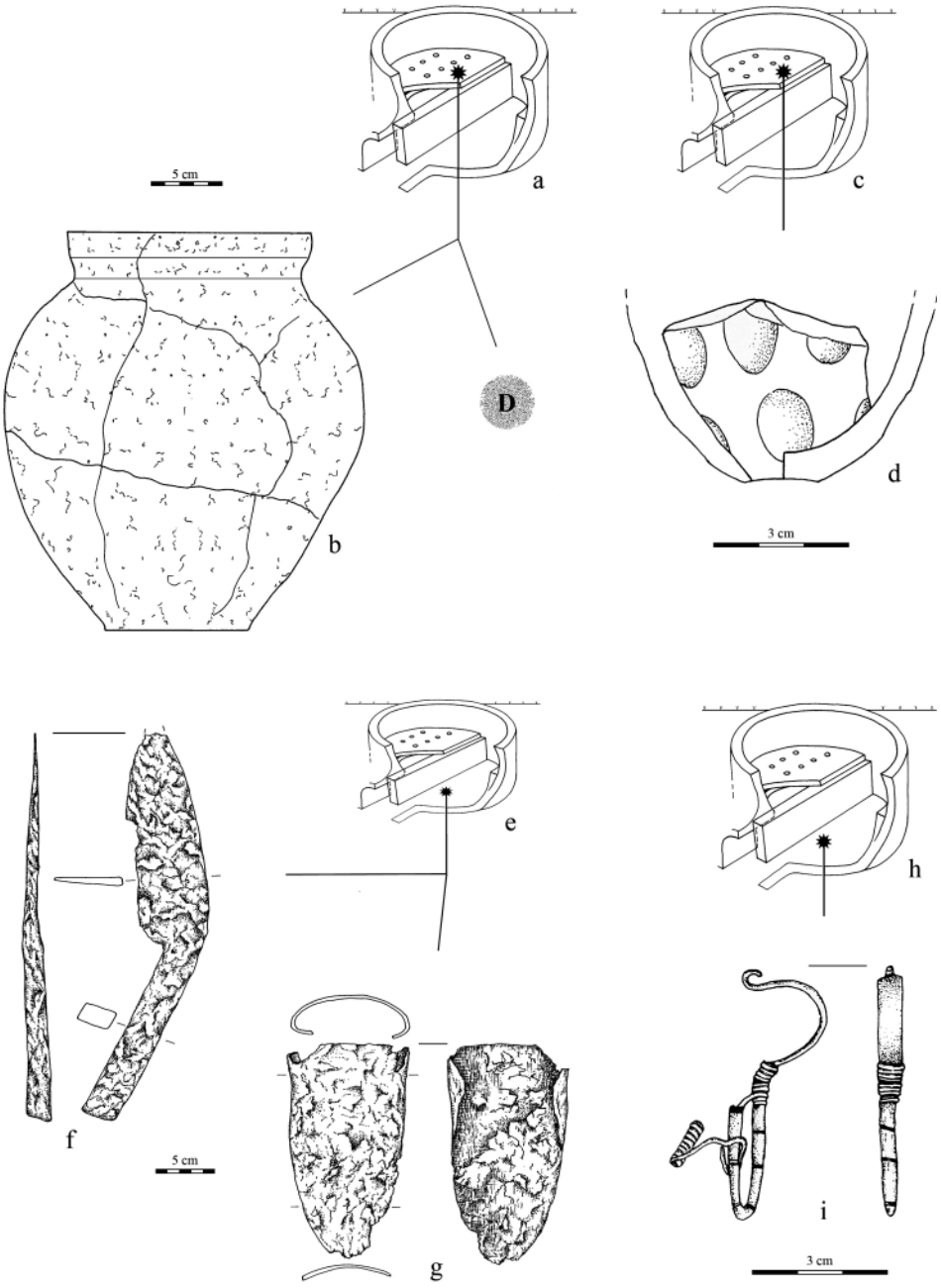

Fig. 4. Zofipole, site 1. Locations of items in kilns.
a – kiln 25; b – clay vessel; D – Hadrian denar; c – kiln 29; d – glass beaker; e – kiln 31; f-g – iron parts of wooden ard; h – kiln 35; i – bronze fibula. Drawn by J. Ożóg

"...the temperature distribution is very uneven, with areas of serious overfiring and underfiring..." (Cardew 1969, 179).

Several years of experimental research related to the construction of – and the firing of ceramics in updraft kilns were carried out in Vadastra village, Romania, by D. Gheorgiu. Supplemented with ethnographic studies, this research brought invaluable information to bear on explaining the essence of the functioning of this machine and its complexity.

In the work of this author, we find the following statement: "...I believe that the control of the machine (i.e. the controlled transformation of matter), the increase of the quality and quantity of the production of one individual, as well as the nocturnal activity of the kiln conferred to the pyrotechnologist a special prestige, probably with a magic role..." (Gheorghiu 2007, 42).

ITEMS DEPOSITED IN KILNS

Of the 36 kilns with various states of preservation excavated at Zofipole, 6 contained deposited items. The most spectacular artefact buried in an oven at Zofipole is the Hadrian denar,minted during the years between 134-138 AD (Kunisz 1985, cat. no. 332 / II, 258). It was placed in organic material that filled a discarded wheel-made pot, which had been deformed by high heat and deemed as production waste (Fig. 4 a, b, D). It was then placed on an unbroken oven floor, separating the two chambers of kiln 25. It was also observed that the kiln's fill was intact (Buratyński 1958, figs 8 and 9, 48; Dobrzańska 2000, 48). Denars from the 1st and the 2nd centuries AD were commonly used from the 2nd half of the 3rd to the first half of the 5th century AD (Godłowski 1970, 240). The coin in question could be used as raw material in the production of items made in the workshops of bronze jewelry, as suggested by the use of early Roman coins in similar studios from the neighboring settlement in Igołomia (Dobrzańska 1990b, 78). At the bottom of the lower chamber of kiln 35, near the fire tunnel, a small, cross-bow bronze fibula (AVI 162) was found; it had a spring wrapped on the leg, thus prepared for remelting in the crucible (Fig. 4 h, i). The whole set is dated to the C1a phase (Dobrzańska 2011, 267). Also found was a large piece of a Roman metal vessel was discovered in chamber of the kiln 1 (no exact location), and served as a metal scrap to be used in the process of production of other bronze items. Below the damaged oven floor of kiln 31, at the bottom of its lower chamber, iron parts of a wooden plough (Fig. 4 e-g) were also found, which, according to the chronology of this object, can be dated to phase C3 (Dobrzańska 2000, 48). E230 glass beaker (Fig. 4 c, d), discovered in the lower parts of kiln 29 (Rau 1972; Stawiarska 1999, 147-151), has a similar chronology. Its connection with the production of pottery is documented by a wheel-made clay vessel, which was found near kiln 29, and mimicks the form and decoration of the E230 glass beaker. Two grinding stones (similar to whetstones) found in the same related to the production of bronze objects (Dobrzańska 2000, 48, fig. 12: 7, 8) A cylindrical iron

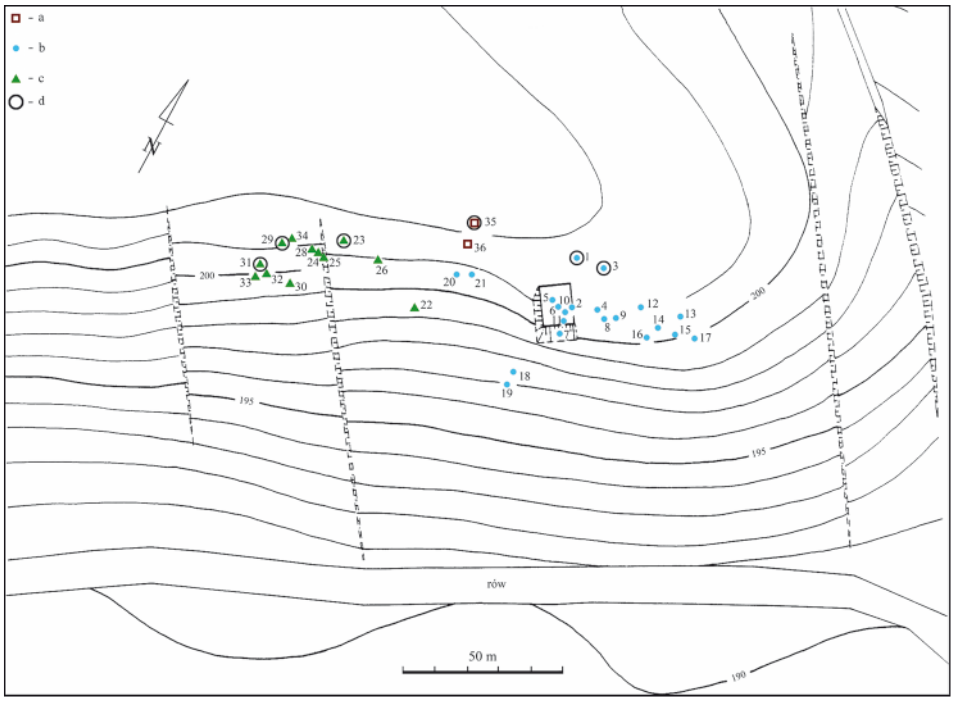

Fig. 5. Zofipole, site 1. Chronology of the kilns
a – phase C1a; b – phase C1b-C2; c – phase C3; d – kilns with "offerings". Drawn by I. Jordan, J. Ożóg

padlock came from kiln chamber 13 has an analogy in the 70/55 building in Igołomia, associated with the activity of bronze-workers and dated to the C2-C2/C3 phase (Dobrzańska 1990a, pl XXVIII: 7; 1990b, 69, 70; 2000, fig. 12: 1).

In the chamber of kiln 3 in Zofipole, burned fruits of Lithospermum arvense L. (field gromwell) in the amount of 67 mm3 were found. This plant is a weed, known from six sites dating back to the Roman Period (Lityńska-Zając 2005, 342; Lityńska and Wasylikowa 2005, 198, 246). In folk medicine, its diuretic effect is well known, and it is also used for menopause and in elderly people with atherosclerosis. Its roots contain a red pigment. Currently, its high nutritional properties are widely appreciated (atlasflory.type.pl/lithospermum_arvense.html).

This tradition of placing the items in pottery kilns is observed throughout the whole period of occupation of the Zofipole site (Fig. 5).

Also in nearby Igołomia, in the chamber of the 3/52 pottery kiln, the bronze fibula AVII of „Sarmatian type" was discovered. In this area, there are also numerous remains of bronzeworks (Dobrzańska 1990a, pl. LXII: 1; 1990b, 64). At the site in Wawrzeńczyce (39 and 41), located 4 km Zofipole, 2 ingots of metal (tin?) were discovered in the explo-

red pottery kiln. They were in the form of irregular patches and were placed at the bottom of the lower kiln chamber and in the kiln fire tunnel (information from Dr. Krzysztof Tunia).

In Tropiszów, at a site about 3 km west of Zofipole, stove 4 was filled with bones of domestic animals that were not burnt. There were cattle skulls, as well as pig and goat bones. An iron sickle was placed on one of the skulls (Reyman 1936, 163-166, pl 28: 1).

The objects discussed above represent a large variety of manufactured products, both in terms of the material from which they were made, as well as the function they performed in the life of the inhabitants of the settlement. Their common feature is the use of fire for their production: iron elements of an ard, an iron sickle, a Roman denar in an clay vessel, bronze fibulae, a fragment of a bronze vessel, and ingots were found, as well as a fragment of a glass beaker. Burnt *Lithospermum arvense L.* fruits were also found. These objects also have in common their location at the bottom of the kiln chamber, or slightly higher, on the oven-floor, which is the place most vulnerable to destruction as a result of burnout. They were never found in the stoke holes. It should also be noted that kilns were backfilled after their productive use, which makes these units homogeneous.

DISCUSSION AND CONCLUSIONS

The observations above allow us to formulate a hypothesis about the intentional placement of the discussed items in the kilns after they used.

In attempting to explain the intentions behind the placement of these objects, it is worth referring to the rich cultural significance of concepts such as fire and kiln (Kowalski 1998, 371-380, 434-438). M. Eliade writes about the association of magic with technological excellence, the “secrets of the profession“ of metallurgists, blacksmiths, and potters. The techniques they used had their origin and basis in the “mastery of fire“, the domain of shamans and sorcerers, before it became the “secret“ of potters and later metallurgists, blacksmiths and other craftsmen. One of the many meanings of the kiln concerns the processes involved in transforming matter from one form into another (e.g., clay hardening), which gives it a symbolic function (Eliade 1988, 188; 1993, 104).

Kiln artifacts may have been “offerings“ for limiting the risks associated with the bursting of vessels. This was also the goal of numerous magical procedures of folk potters, which did not take on a material form, but were reflected in the richness of beliefs and folklore (Czubala 1974; 1978). Buried items are also a material illustration of the perception of fire as a powerful transforming force, both physically and symbolically, by local producers.

The objects in question also reflect other types of activity of people living in Zofipole, namely the cultivation of land and the production of objects from non-ferrous metals. Using them as „offerings“, in the context discussed here, indicates a clear connection of

potters with these areas of production. While potters could participate in agricultural work, which is documented by numerous ethnographic data, the hypothetical combination of the production of vessels and the production of bronze objects, as for now, must remain in the sphere of discussion. It is highly probable that craftsmen working with non-ferrous metals used high temperatures, exceeding 1000°C in the fire tunnels of kilns (Dušek *et al.* 1986, 59-63), for melting the bronze scrap.

The results of research on the ceramic production centers in the Vistula valley, especially in Zofipole, indicate the seasonal character of this production, depending on their current needs. In Zofipole, the pottery was made for about 180 years, during which the continuity of some of the basic pottery forms, and of kiln construction, were maintained (Dobrzańska 2011, figs 10-12). Production skills were passed in the master-student relationship. A part of this tradition is also discussed in this article as the custom of placing "offerings" in kilns (where matter is transformed), and is directly related to the work of potters, and to a lesser extent, bronze-workers. Given the aforementioned multiplicity of meanings „kiln" and „fire", and especially their symbolism, it seems that we cannot take into account only the intent of production alone. The actual transformation of the matter placed in the kiln into a completely different kind of object is a representation of birth or initiation, which always require the experience of symbolic death (Kowalski 1998, 435).

The presence of the *Lithospermum arvese L.* plant in the kiln, which has pharmacological properties, may be related to therapeutic practices carried out by the potters. In folk pottery, clay treatments in the form of compresses in which other components, and the usage of clay solution in healing drinks, is noted (Czubala 1974, 198; 1984).

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