

# A »Kernos-Type« Vessel from the Baden Culture Site Zesławice Used for Textile Production?

## Abstract

Between 1953 and 1958, excavations were carried out at two sites (nos 21 and 22) in the village of Zesławice (now part of Krakow). Both sites were associated with the settlement of the Baden culture. In one of the sites, two intriguing vessels with »pockets« were found. They were shaped like pear-shaped amphorae with cylindrical rims and bases with a small diameter.

One of the vessels, due to the lack of analogies in the Baden culture, resembles a Kernos-type vessel in shape. This container refers to vessels with nozzles, which were used for twisting threads. The skeins of thread were placed in smaller compartments, and the ends were pulled through the nozzles of the vessel and then pulled out through the main opening. In this way, the threads were twisted using a spindle, probably suspended from the ceiling. The use of such clay vessels began in the Chalcolithic period and continued throughout prehistory in various forms and cultural contexts.

## Keywords

Central Europe / Poland / Baden culture / Chalcolithic period / spinning process

## The Sites

Sites nos 21 and 22 in Kraków-Zesławice (pow. Krakowski/PL) are located on the western slope of a prominent hill, descending towards the Dłubnia River, belonging to the Proszowice Plateau (part of the Lesser Poland Upland) (Kondracki 1994, 233–234). Its entire surface is covered by brown soils formed on loess. The height difference between the current river level and the sites is about 30 m. Originally, sites nos 21 and 22 were called Dłubnia and marked with the Roman numerals I and II. Site no. 21 is located about 140 m away from site no. 22.

The sites were discovered during the construction of a brick factory in Zesławice, which was meant

to supply building materials for Nowa Huta (pow. Krakowski/PL). The excavations were carried out in the years 1953–1958. Initially, the research was led by Zdzisław Sochacki (1953 and the beginning of 1954), then by Stanisław Zemełka (1954–1957), Stefan Wołczyk (1957), and again by Zdzisław Sochacki (1958). During the fieldwork, about 240 features were registered, both settlements and burials (due to incomplete documentation, it is impossible to determine their exact number). The vast majority of them belonged to the Baden culture. Sochacki states that he attributed 227 features to the aforementioned culture, including two graves (Sochacki 1988, 6). Al-

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most all features of this culture were discovered at site no. 21 (220), where the residential part was located.

The settlement had an oval shape with dimensions of 200 m × 145 m, with the longer axis running northwest to southeast (Sochacki 1988, 98). The large number of features accumulated in a small area suggested that the hill was not inhabited simultaneously. By excluding certain types of features, it was possible to distinguish two settlement phases.

The second site (no. 22), covering an area of about 0.3 ha, was associated with animal husbandry. A cattle pen surrounded by a ditch was discovered, along with a silted-up water reservoir and features that could have served as shelters (Sochacki 1988, 110–113).

More features from site no. 21 and all features from site no. 22 were assigned to the older settlement phase. Fewer features (64–72) are associated with the younger phase (Gołowska 1968, 110). Unfortunately, the incomplete documentation of the research does not allow for the reconstruction of the principles of object distribution within this Neolithic settlement. The modern clay mine (for the nearby brick factory) destroyed or damaged some of the settlement pits. Based on the preserved features (pits) and their functions, an attempt was made to reconstruct the internal organization of the Zesławice settlement.

In its southern part, pits related to household utility functions were identified. These were mainly cellars serving as granaries. All such pits had a trapezoidal shape in profile. Before use, their walls were secured by burning or coating them in clay and firing them. They were mainly located in sunny areas that were free from groundwater (Sochacki 1988, 90).

In the central part, features relating to residential construction predominated. These included residential structures of the semi-subterranean type and above-ground buildings. The former were preserved as oval or oval-circular pits with intact entrances, equipped with fireplaces, and sometimes with remnants of clay structures from above-ground constructions. Additionally, tool fragments found in the infill of the feature could indicate their residential function. Above-ground residential structures were identified based on the presence of a combination of features and fireplaces.

In the northern part, an area related to spirituality and rituals was distinguished. It included one cult object and two graves. It should be noted that very few graves of the Baden culture have been found in Poland so far. The graves discovered in Kraków-Zesławice were skeletal burials (nos 10 and 217), with the deceased lying on their side (Zastawny et al. 2009, 455–456).

## Find Context and Description of the Vessel

The feature, which could have served as a cult site, was distinguished based on its equipment. It was a pit preserved only in about one-third of its original entirety, marked with the number 52/1/54. The remaining part was mechanically destroyed during earthworks related to the clay mine. It was 200 cm deep, with an upper diameter of about 50 cm and a bottom diameter of about 200 cm. In profile, it had a trapezoidal shape. Originally, the entrance was reinforced with sticks coated with clay, as evidenced by clay fragments with such impressions (Sochacki 1964, 304). Sochacki distinguished several layers in it (infills and usage layers).

The uppermost layer was devoid of artifacts and clay fragments. In the second layer beneath it, apart from quite numerous artifacts, loose clay fragments with impressions and a small amount of charcoal were found. The third layer (possibly a usage layer), devoid of clay fragments, contained pottery fragments from two large vessels (according to Sochacki). The remaining fragments of these vessels were found in the ceiling of the fourth hearth layer. Apart from earth, the latter consisted of solid, thick, com-

pacted clay lumps, ash, and small pieces of charcoal. The fifth layer was composed of hard, dark earth with remnants of charcoal.

From the lower parts of the pit (layers 3–5), two interesting vessels with »pockets« were reconstructed (Sochacki 1964, 306). They were pear-shaped amphorae with cylindrical rims and small-diameter bases. According to Sochacki, the first one had a total height of 61.5 cm, a rim diameter (excluding the pockets) of 26 cm, a pocket diameter of 12 cm, a belly diameter of 78 cm, and a base diameter of 17 cm. The height of the pockets was approx. 15 cm (**fig. 1**). The dimensions of the second vessel are unknown, as it survived in smaller fragments, which made the measurements less precise. Various sizes are provided in the publication (Sochacki 1964, 307), but these can only be accepted with a significant probability, as large Neolithic hand-formed vessels were sometimes deformed, making it impossible to determine all their parameters. Its rim diameter exceeded 20 cm, and its belly diameter exceeded 60 cm.

The enigmatic aspect of these vessels appears to be the pockets (small containers) attached to the rim



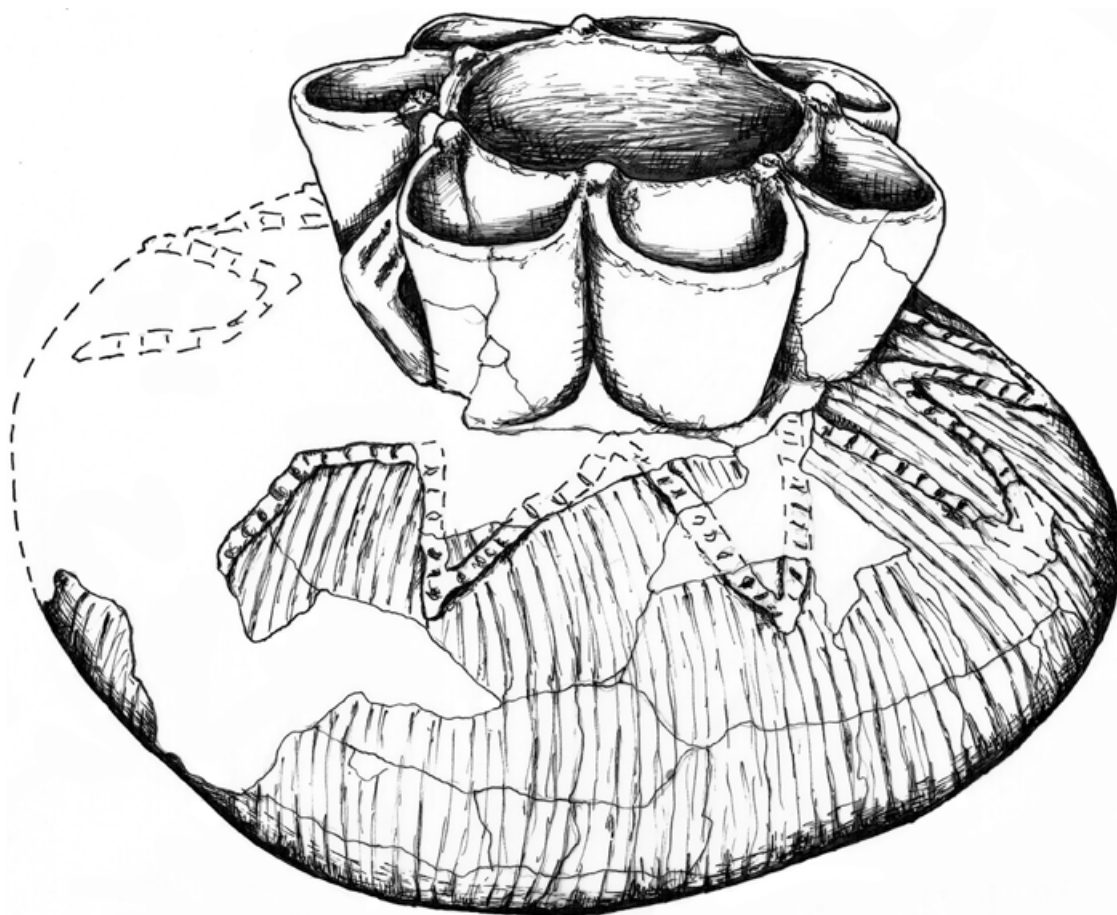
**Fig. 1** Photo of the vessel from site no. 21 in Kraków-Ześlawice. – (Photo J. Bober). – Without scale.

that were open to the interior of the vessel (**fig. 2**). Each pocket is connected to its neighboring pocket by a single wall. Their height is the same as the rim. At the connection point between the pocket and the rim, there is a small, slightly flattened knob. The only gap in the rim is filled with a ribbon-like handle, typical of the Baden culture, which ends on the edge of the rim with three slightly flattened knobs. The lower part of the handle is attached to the vessel at the transition from the belly to the neck, similarly to the lower parts of the pockets. In the upper part of the belly, there is a plastic ornament in the form of a strip with nail decorations. When viewed from above, it likely forms an eight-pointed star. Below the handle, the arrangement of this strip is unknown because these parts of the vessel have not survived. Inside the »star-shaped« ornament and on the belly, vertical grooves are visible.

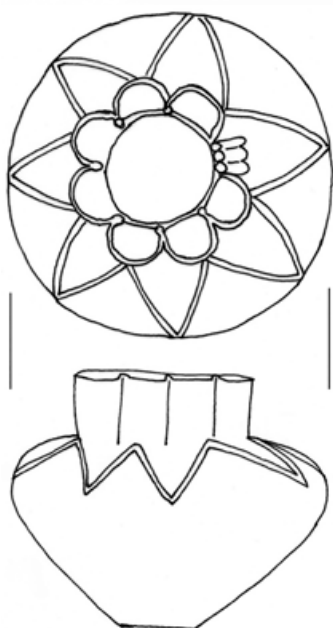
Currently, the reconstruction of the entire vessel is being questioned because rebuilding Neolithic vessels often presents difficulties. This is due to their asymmetrical structure and poor firing. Further-

more, all the fragments used for reconstruction may not originate from two vessels, but from a single one.

The collection of artifacts from feature 52/I/54, including the unique vessel with »pockets«, deserves further attention. Its uniqueness lies in the original shape of the upper part adjacent to the rim. Without the pockets, it would not differ significantly from the other amphora-like forms commonly found throughout the area inhabited by the Baden culture population. From the Nowa Huta area alone, where this vessel was discovered, at least dozen examples of amphorae could likely be cited. A few examples with belly ornaments in the form of plastic strips will be mentioned. They occurred at sites nos 21 and 22 in Kraków-Ześlawice (Godłowska 1968, 99 fig. II pls XVI, 23; XXVI, 6; Sochacki 1988, pl. XII, II–12), sites no. 5 in Kraków-Wyciąże (Bober 1995, pl. I, 4), sites nos 17–20 in Kraków-Pleszów (Rook 1971, 177 fig. 28), sites nos 53 and 55 in Kraków-Mogiła (Bober 1993, pls III, 16; VII, 18; Godłowska 1976, pls XLIV, 6; LVI, 3), and sites nos 7, 58, and 65 in Kraków-Cłó (Bober 1998, pl. V, 5; 2018, pl. 2, 9).



a



b

**Fig. 2** Vessel from site no. 2I in Kraków-Ześlawice: **a** drawing. – **b** visualization. – (Drawing M. Byrska-Fudali). – a scale 1:5; b without scale.

However, when considering the vessel with pockets, the situation is different. In the existing inventory of the Baden culture, a few fragments from such vessels can be distinguished (Horváthová 2015, pl. V, 10), but only one is very similar in form. It was found

in the Jennyberg near Mödling in Lower Austria (fig. 3, 2) in the 1920s (Ruttikay 1974, 45). It ended up in a private collection in Gießhübl. The Austrian vessel has also an amphora-like shape with an inverted pear-shaped belly. According to the publi-



cation, its height was 42 cm, with a similar diameter for the belly. In the upper part of the belly, there are six »pockets« in the shape of funnels connected to the main vessel. The Austrian vessel is also classified as a ritual object (figs 4–5).

However, due to the lack of analogies in the Baden culture, it is instead compared to Kernos-type vessels with pockets, which were used in the Mediterranean region and Central Europe from the Chalcolithic period. In the Mediterranean basin, such items were used in ritual practices (Boghian 2012, 39–63; Buzoianu/Alexandru 2023, 87–88). The pockets contained substances such as honey, oil, wine, and vegetables. Similarities to vessels from the Hallstatt period, the Roman period and the Middle Ages are also mentioned (e.g., Niewęłowski 1964, 231 figs 2–3; Czopek 1985, 392–393; Bartel 1998; Delnef 2006; Kuśnierz 2010; Łaciak 2018; Gediga et al. 2020, 42).

## Discussion

As mentioned earlier, the ceramic container from Kraków-Zesławice resembles in form the Kernos-type vessels, which are associated with rituals. This text will present another potential use for this clay vessel, which could possibly be linked to textile production.

Undoubtedly, the most important archaeological find indicating the use of similar containers for this purpose was made in a 6<sup>th</sup>-century cemetery in Pfakofen (Lkr. Regensburg/DE) (Bartel/Codreanu-Windauer 1995). Among the grave goods of an adult woman (grave no. 74), a vessel with six nozzles (fig. 6) and the remains of a spindle with a weight at the top were discovered. The analysis of the vessel's contents revealed traces of wool and kermes (Bartel/Codreanu-Windauer 1995, 254–272; Bartel 1998, 145–147). In the first case, it involved one of the basic textile materials (Gleba/Mannering 2012, 6), while in the second, traces of the insect kermes (*Porphyrophora*), whose larvae were collected from the roots of small plants – perennial knawel (*Scleranthus perennis*). Historical sources indicate that harvesting took place in late spring and early summer, and to collect 1 kg of the insect, approx. 260,000 plants had to be uprooted (Mączak 2005). After drying and grinding, it produced a red dye (Michałowska 2006, 56; Grömer 2016, 161).

The vessel from Kraków-Zesławice resembles, in form, nozzle-equipped vessels used for twisting threads. For this purpose, balls of thread were placed in smaller containers, and their ends were passed through the nozzles of the vessel, then pulled out



Fig. 3 Map with marked localities: 1 Kraków-Zesławice. – 2 Jennyberg. – (Map M. Byrska-Fudali).

through the main opening. In this way, the threads were twisted together using a spindle suspended, for instance, from the ceiling (Bartel/Codreanu-Windauer 1995, 260–262) (fig. 7).

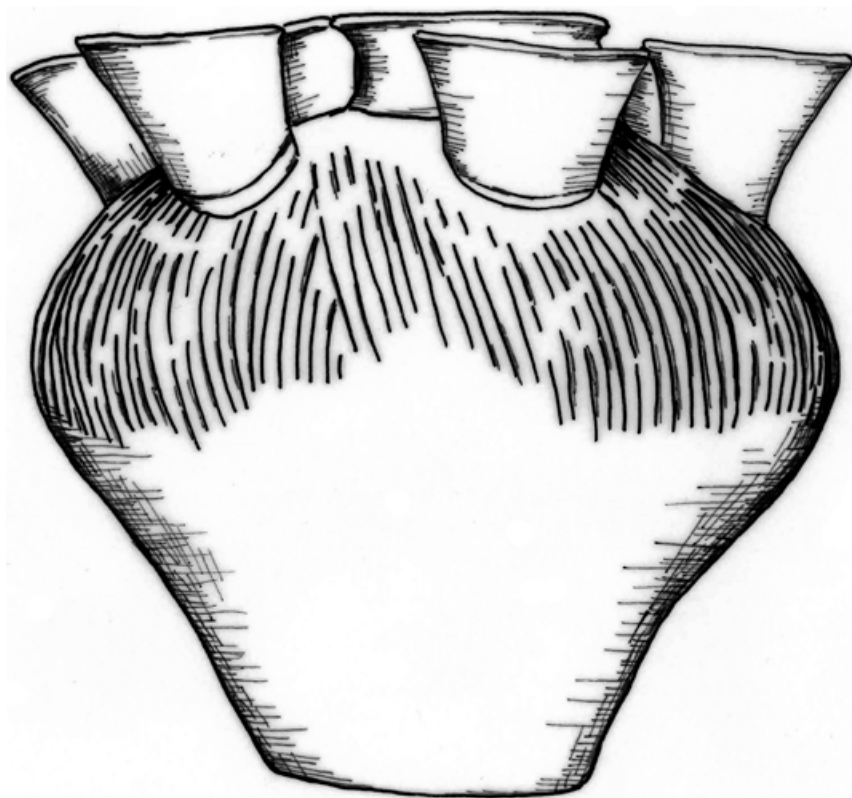
The use of such spaced containers with placed balls of thread is evidenced by iconographic representations (fig. 8) and observations made in Romania in the 1930s (Bartel 1998, 143–144 figs 4–6).

The use of such a set of vessels during the spinning process could have been motivated by various reasons. First and foremost, the balls of thread in the smaller containers would not become dirty or tangled. In the small containers or baskets, different-colored threads could be placed one after the other, which were then twisted together.

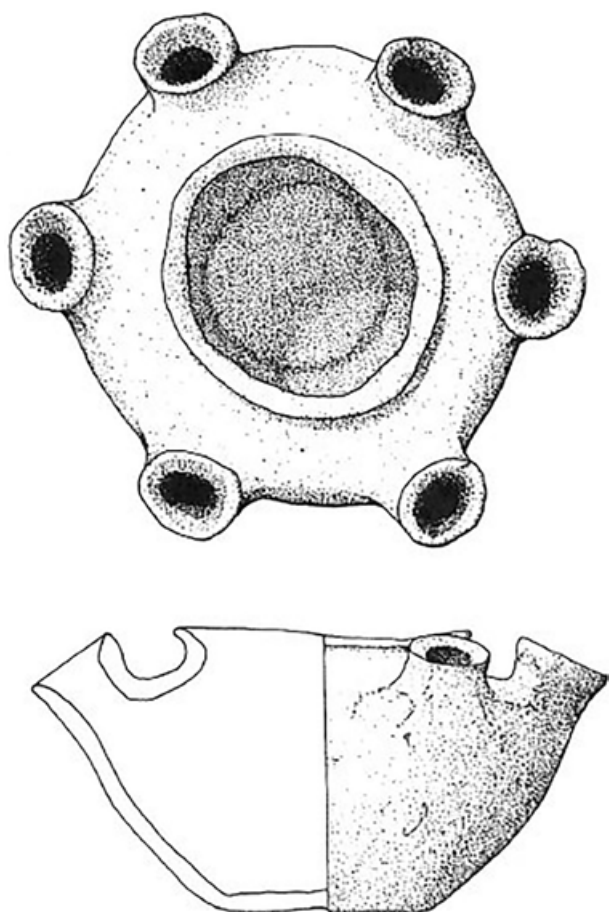
It should be noted that the primary textile materials used in prehistoric times were plant fibres: flax, hemp, nettle, tree phloem (Hald 1942, 40; Zohary/Hopf 2000, 126–127, 132; Gleba/Mannering 2012, 6–8; Bender Jørgensen et al. 2016, 70–71), and animal fibres: wool, mainly of sheep, but also fibrous varieties of goat, fibres from tendons (Chmielewski 2009a, 28–51; Moskal-del Hoyo/Badel Garcia 2009, 245, 251; Słomska/Antosik 2020, 123).



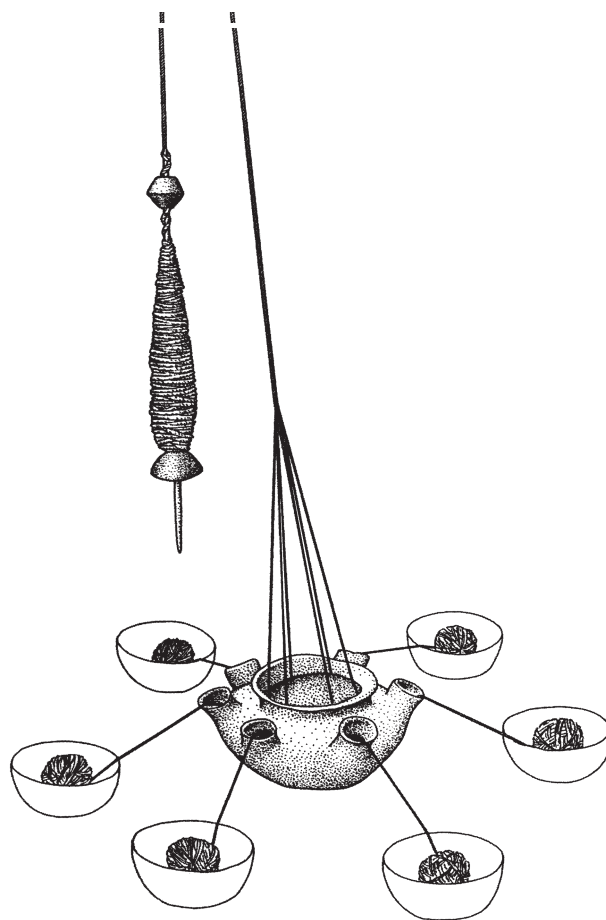
**Fig. 4** Photo of the vessel from the Jennyberg. – (Photo Karl Gruber, Mödling\_Bezirksmuseum\_5947.jpg, Wikimedia Commons CC BY-SA 4.0).



**Fig. 5** Drawing of the vessel from the Jennyberg. – (After Ruttkay 1974, fig. 1). – Scale 1:4.



**Fig. 6** The vessel with nozzles from Pfakofen. – (After Bartel 1998, 142 fig. 3). – Without scale.



**Fig. 7** The reconstruction of yarn twisting using a dish with nozzles. – (After Bartel 1998, 144 fig. 6).

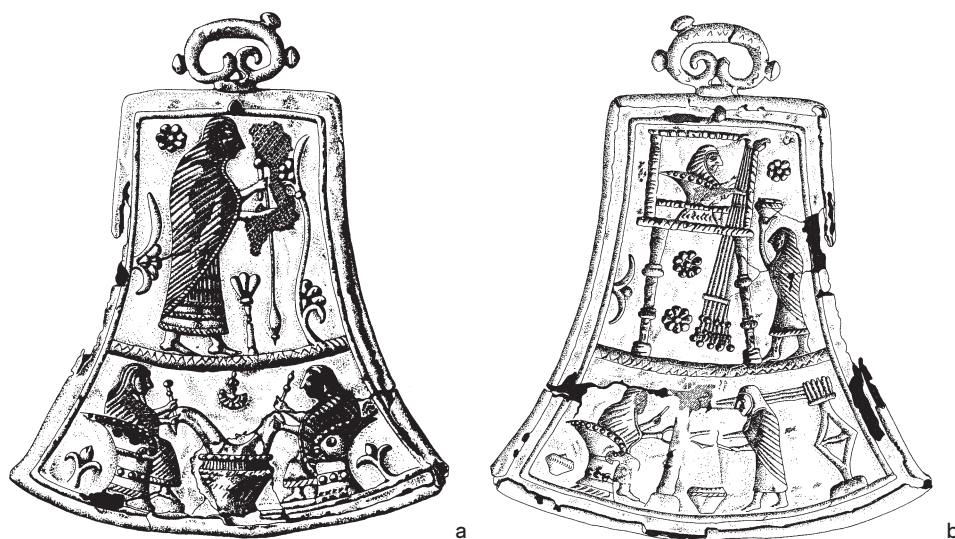
Without a doubt, an important technical issue in processing plant fibres is that moist threads are less brittle and easier to spin. Ethnographic accounts indicate that spinners dipped their fingers in water containers to moisten the threads during their work. A similar effect could certainly be achieved by placing the raw material in vessels containing liquid (Chmielewski 2009a, 148–149).

As Tomasz Jacek Chmielewski, among others, has shown, the use of this type of clay vessel began in the Chalcolithic period and continued throughout prehistory in various forms and cultural contexts. However, over time, they lost their original function (Chmielewski 2009a, 158; 2009b). At this point, it should be noted that nozzle-equipped vessels were not the only clay containers used in the process of thread production. In addition to these, spinning

bowls were also used, which had one to four holes at the bottom through which threads were passed (Chmielewski 2009a, 149–156; Silvar 2016; Ruiz de Haro 2018). These vessels complemented the wide assortment of spindle whorls commonly used and discovered during archaeological excavations (Chmielewski 2009a, 148–158; Pipes et al. 2019).

To summarize, it should be emphasized that this text aims to present one of the possible uses of the vessel found in Kraków-Ześlawice. At the same time, the above issue requires further consideration and research. It should be remembered that the main sources of information about textile production in the Chalcolithic and Neolithic periods are textile tools, rather than the original finished products of this process (for more, see Siennicka et al. 2018).





**Fig. 8** Images of vessels (a-b) used for spinning on an Etruscan pendant. – (After Gleba 2012, 233 fig. 9.16). – Without scale.

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# Zusammenfassung

## Résumé

### Ein Gefäß vom Typ Kernos aus der Badischen Kultur von Zesławice - für die Textilproduktion verwendet?

Zwischen 1953 und 1958 wurden an zwei Fundstellen (Nr. 21 und 22) in Zesławice (heute ein Teil von Krakau) Ausgrabungen durchgeführt. Beide Stätten wurden mit der Besiedlung durch die Badische Kultur in Verbindung gebracht. An einem der Fundorte kamen zwei faszinierende Gefäße mit »Taschen« zutage. Sie hatten die Form birnenförmiger Amphoren mit zylindrischen Rändern und Böden mit kleinem Durchmesser.

Eines der Gefäße ähnelt aufgrund fehlender Analogien in der Badischen Kultur in seiner Form einem Gefäß vom Typ Kernos. Dabei handelt es sich um Gefäße mit Tüllen, die zum Zwirnen von Fäden verwendet wurden. Die Fadenstränge wurden in kleinere Fächer gelegt, die Enden durch die Tüllen des Gefäßes gezogen und dann durch die Hauptöffnung herausgezogen. Auf diese Weise wurden die Fäden mithilfe einer Spindel gezwirnt, die wahrscheinlich an der Decke hing. Die Verwendung solcher Tongefäße begann im Chalkolithikum und setzte sich während der gesamten Vorgeschichte in verschiedenen Formen und kulturellen Kontexten fort.

### Un vase de type Kernos du site culturel de Baden Zesławice - utilisé pour la production textile?

Entre 1953 et 1958, des fouilles ont été menées sur deux sites (nos 21 et 22) dans le village de Zesławice (qui fait aujourd'hui partie de Cracovie). Les deux sites étaient associés à l'établissement de la culture de Baden. Sur l'un des sites, on a trouvé deux récipients intrigants avec des »poches«. Ils avaient la forme d'amphores en forme de poire, avec des bords cylindriques et des bases de petit diamètre.

En raison de l'absence d'analogies dans la culture badoise, l'un des récipients ressemble à un récipient de type Kernos. Ce récipient se réfère à des récipients munis de buses, qui servaient à tordre les fils. Les écheveaux de fil étaient placés dans des compartiments plus petits, et les extrémités étaient tirées à travers les buses du récipient, puis ressorties par l'ouverture principale. Les fils étaient ainsi tordus à l'aide d'un fuseau, probablement suspendu au plafond. L'utilisation de tels récipients en argile a débuté au Chalcolithique et s'est poursuivie tout au long de la préhistoire sous différentes formes et dans différents contextes culturels.

## Schlüsselwörter

## Mots-clés

Mitteleuropa / Polen / Badische Kultur / Chalkolithikum / Spinnverfahren

Europe centrale / Pologne / culture de Baden / période chalcolithique / processus de filage