The Potter's Wheel

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The Potter’s Wheel

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Introduction

The potter’s wheel was invented in the 5th millennium BC in the Near East and spread across the Mediterranean into southern and eastern Europe during the late Bronze and early Iron Ages before also reaching Asia and, finally, the American continent. The potter’s wheel utilized new technological principles, namely, rotational kinetic energy (RKE) combined with manual force, to shape vessels. Initially, however, it seems that the wheel was only used to make small shapes or medium-sized and larger pots in stages and was not used for wheel-throwing but hybrid techniques. When utilized to its full potential, this innovation has the ability to speed up production considerably. It remains a mystery why ethno graphic studies consistently show that the potter’s wheel is almost exclusively associated with male potters.

Definition

Scholars have conventionally defined potter’s wheels either by placing greater emphasis on the device’s design (Childe 1954; Evely 2000; Franken 1971; Holthoer 1977; Saraswati and Behura 1966; Streily 2000; Wood 1990) or on the speed/length of rotation that can be achieved (Arnold and Bourriau 1993; Foster 1959a; Rice 1987; Roux 2019; Scheans 1965; Thér et al. 2017). In reality, most scholars recognize that the two aspects need to be considered together as unaided rotation requires a stable and smoothly running flywheel.

Potter’s wheels are traditionally divided into two categories: simple and double (or kick) wheels (Holthoer 1977) (Figs. 1 and 2). Both can reach a maximum speed of 220–230 rotations per minute (rpm), though most potting activities will fall within a range of 50–120 rpm. The simple wheel consists of one single, heavy wheel that serves both as the flywheel and the potting surface. It is activated by stick or by hand – either by the potter or an assistant. The momentum is stored in the heavy wheel and will gradually slow down as the potter works. A pivoting axis is set in the ground and, depending on its length, may also need stabilizing higher up. To achieve the necessary weight, they are normally made of stone or...
clay, though wood can also be used. The simple
wheel can be constructed at any height, and
potters may sit, squat, or stand to work on it. The
double wheel is constructed of a light round upper
throwing surface and a heavy flywheel below
which are connected by a fixed vertical axis. The
advantage of the double wheel is that potters
themselves can adjust its speed seamlessly by
kicking the flywheel at the bottom while
constructing the pot on the small throwing surface
on the top.

Potter’s wheels need to be distinguished from
rotary devices and turntables (or tournettes). A rotary device is not mounted on an axis and
hence does not generate any rotational momen-
tum. A rotary device might be a wooden or clay
plate, bat, or a large clay sherd upon which a pot
is being constructed. Early Bronze Age “mats”
from Crete are good examples of this type
(Evely 2000: 271–273 (Type 1)). A turntable is
a device mounted on an axis which the potter or
an assistant can rotate, but any momentum gener-
ated slows down quickly and does not allow the
creation of an entire vessel. Turntables can be
made of wood, clay, or stone. Roux considers
prehistoric Mesopotamian and Palestinian stone-
pivot arrangements to fall into this category
(2019: 50; Roux and de Miroshedji 2009)
(Fig. 3). The division of devices into rotary
devices, turntable, and wheel is based on the
assumption that only wheels can achieve suf-
ficient rotational kinetic energy that would allow
the wheelhead to spin for long periods of time
despite the weight of the flywheel itself, the
weight of the clay, and the pressure exerted by
the potter while making the pot. However, in
reality, the distinction between the different pot-
ting devices is rather fluid and imprecise.

Several physical phenomena impact on a ves-
sel as it is being thrown on the wheel. These are
the rotational kinetic energy (expressed in terms
of angular velocity and the moment of inertia), as
well as manual pressures. Angular velocity is the
amount of rotation the wheel undergoes based on
its speed and direction. The moment of inertia is
the distribution of mass around an axis of rotation
and refers to the opposition of the device to
changes in speed of rotation. Calculations may
include, for example, its weight, dimensions, and
morphology. Hence, rotational kinetic energy is
the rotational energy that the wheel exerts bearing
in mind the speed of rotation and opposition to
this rotation. Manual pressures are vertical and
horizontal pressures of the potter’s hands in rela-
tion to the malleable clay as she/he pulls up the
vessel, thins the walls, and molds its shape by
pushing inward or outward with one or both hands. In contrast to common perception, centrifugal force – which exerts pressure toward the outside – does not play an active role in raising a vessel up; it only contributes negatively or positively by making inward movement harder or by supporting outward movement (Roux 2019: 76–83). A similar argument can be made about gravity which could also be considered a passive force in that it attracts a material toward the center of the earth and thus exerts downward pressure on the clay mass, but does not impact positively on the upwards throwing motion of a potter.

Excavations do not necessarily reveal potter’s workshops or evidence of potter’s wheels and archaeologists therefore must rely on macroscopic and microscopic traces on the pots themselves to deduce the use of a potter’s wheel (Evely 2000: 269; Van As and Jacobs 2014: 89). There are several of these marks or traces.

The first of the macroscopic marks is the base (or central) spiral. This spiral is created when the potter applies first downward and then outward pressure with their fingers to open the clay ball and to create the base width of the vessel. It quite often leaves a raised central “pimple.” Because the wheelhead of the potter’s wheel offers solid resistance, the base spiral is normally well pronounced (Fig. 4a). The second feature is throwing grooves, also called rilling, on the outside and/or inside of the vessel wall. Rilling marks are best observed on the interior of restricted vessels. They can be shallow or deep and horizontal, concentric, or spiraling depending on the pressure, direction, and speed applied by the potter. The more even and continuous these grooves, the more likely they are made by throwing (Fig. 4b). Uneven or discontinuous rilling may hint at forming techniques that only utilize rotation for part of the manufacturing sequence (Courty and Roux 1995). When pots receive secondary treatments like smoothing, scraping, burnishing, or turning, rilling marks may be obliterated entirely. Thirdly, there are diagonal compression ridges in
the neck region which occur when rotating clay is being pushed inward to create a neck. The fourth mark is the spiral cut-off pattern on the underside of the base. When the wheel is rotating while the potter is cutting the pot off with a string or wire, this action leaves a characteristic decentralized spiral pattern on the underside of the base (Fig. 4c). Stationary vessels leave linear marks. Cutting marks are often removed by subsequent treatment. Finally, there is a gradual thinning of

The Potter’s Wheel, Fig. 4 (a) Base spiral. (b) Rilling. (c) Cut-off spiral pattern. (d) Gradual thinning of wall from base to rim
the wall from the base to the rim. Unlike hand-made pots which can display the same wall thickness from base to rim, wheel-thrown vases normally show a gradually reducing thickness as the lower section would otherwise collapse under the weight of the upper section (Fig. 4d).

While all these marks and features are clear evidence of the utilization of some rotating device at a particular stage during the making of a vessel (e.g., the base, the neck, or removal of the pot), none of these marks are incontrovertible or unambiguous evidence of throwing as turning devices can leave similar patterns nor do they confirm that the entire pot has been made on the wheel.

Absence of distinct traces of hand-forming techniques, such as coil seams, mold seams, or uneven wall thickness as a result of paddle and anvil action, can aid our interpretation.

In addition, there are further – more subtle – macroscopic indicators of wheel-throwing. Firstly, there is the pot’s symmetry. Handmade pots can take on any shape, regular or irregular. In contrast, pots thrown on a wheel are, by the very nature of the device, symmetrical and regular in shape. Secondly, as wheel-throwing requires clay to be wet in order to make it malleable, this can lead to unintended stretching of the clay which is visible as small cracks in the wall. Finally, the existence of self-slip is indicative of the use of water during the manufacture which creates a very thin layer of liquid clay that settles on the walls of the vessel. It may be removed by subsequent surface treatment or decorating.

Most of these indicators are polysemic and can be the result of entirely different forming techniques. However, the most reliable ones for throwing are the base spiral and reducing thickness between the base and rim as they are less likely to stem from other manufacturing techniques.

Microscopic investigations, while time-consuming, costly, and limited in sample size, can be very helpful in determining whether or not a pot was wheel-thrown by evaluating porosity (volume, size, orientation, frequency, distribution and degree of connection with other pores) and inclusions/temper (orientation and distribution of elongated inclusions or temper). Porosity is impacted by the amount of water and temper/inclusions used, the type of temper/inclusions, the content of the clay matrix, kneading, and preparation as well as firing – as a consequence, porosity is a good indirect indicator of forming technique. Petrography, X-radiography, and, most recently, high-resolution X-ray microtomography have shown that handmade and wheel-thrown vessels can be confidently identified based on the above criteria and that distinction between different wheel-utilizing techniques and wheel-throwing is also often possible (Berg 2008; Karl et al. 2013; Pierret et al. 1996; Thér 2016).

Scholars have identified the speed (in rpm) and/or the duration of unaided rotation (often called the “momentum”) as key characteristics of a true potter’s wheel leading to a supposed division of wheels into “slow” and “fast” types (Holthoer 1977; Roux and Mioschedji 2009; Orton et al. 1993: 120–125; Rice 1987: 132–135; Childe 1954), with “slow” wheels not considered proper potter’s wheels. The assumption is that rotational kinetic energy (some scholars mistakenly identify it as centrifugal force) only starts acting upon a vessel when the wheel reaches a particular speed (rpm) and that pots made at slow speeds therefore are not “thrown.” The minimum speed required to attain RKE has not yet been demonstrated experimentally or theoretically. Various speed ranges for throwing pots are mentioned in the literature but normally lie around 80–150 rpm (Childe 1954; Amiran and Shenhav 1984: 108; Doherty 2012: 17; Evely 1988: 118; Roux 2010). However, experiments have demonstrated that pots can indeed be thrown at very low speeds and hence that rotational kinetic energy acts upon clay at all speeds: 36 rpm was sufficient to throw a 10 cm tall cup (Berg 2013: 116); 15–20 rpm were used to form a small pot (Doherty 2012: 17); and a medium-sized vessel was thrown at 60 rpm (Foster 1959b: 62) even when the potters themselves consider the task time consuming, more laborious or boring. The presumption of a minimum speed at which rotational kinetic energy jumps into action also ignores the reality of potting, whereby the potter will vary the wheel speed depending on the stage of the throwing process.
and the size of the vessel: centering is done at higher speeds than pulling up or shaping; and the larger the vessel and the greater the clay mass, the slower the speeds (Gandon et al. 2011).

The second assumption is that a wheel has to spin for a considerable amount of time to throw a pot. However, ethnographic data have shown that, for example, experienced potters only need approximately three and half minutes to complete a pot of 47.5 cm × 20 cm × 22.5 cm (Saraswati and Behura 1966: 54). A household factory potter in Spain could throw 100 small items in an hour and a Mexican potter could make one food bowl every 47 s on average (Arnold 1985: 208, 244–245). Thus, when high speeds can be obtained, the necessary duration of unaided rotation to complete a pot is considerably shorter than standard accounts seem to imply. Where the moment of inertia is too great, the use of an assistant who keeps the wheel in motion can be used to overcome any disadvantages.

Finally, we must discard the common assumption that the potter’s wheel is exclusively associated with wheel-throwing. As the case studies below demonstrate, a wide range of hybrid forming techniques combine handmade techniques with the wheel at different stages of the forming process (Courty and Roux 1995). All of these may utilize the potter’s wheel as a device, but do not necessarily use it to its full potential. Instead, they may use it more like a turntable by using it at lower speeds or for shorter periods of rotation.

**Historical Background and Future Directions**

From the 1950s to the 1990s ethnographic studies of traditional potters were at the forefront of researchers’ endeavors. We now possess a very comprehensive library of worldwide case studies (Arnold 1985; Foster 1959a, b; Kramer 1997; Saraswati and Behura 1966), and there is a sense that additional examples will not dramatically change our existing knowledge base. Experimental archaeology was another valued avenue of exploration, much of it focusing on reconstructing potter’s wheels to understand their design features, physical potential, and limitations (Arnold and Bourriaux 1993; Roux and Corbetta 1989). We have now acquired a solid understanding of these factors and, thus, experimental work has changed direction to helping us understand the very essentials that underpin the utilization of the potter’s wheel, such as the nature of the physical forces acting upon the wheel and establishing the level of skill potters have, and how this impacts on their use of the wheel (Roux 2019; Gandon and Roux 2019; Gandon et al. 2011). Despite decades of research into the potter’s wheel, there is still much that is unknown about the very core forces and aspects, and it is in this subject area where future contributions to knowledge will have the greatest impact on our understanding. With finds of potter’s wheel relatively rare but pots abundant, another strand with great future potential are investigations into the features encoded into pots that were made on the wheel to see whether we can work backward from the product to the device (e.g. Berg 2008; Choleva 2018; Jeffra 2013; Thér et al. 2017). Again, experimental archaeology will take a leading role here by working with replica control groups before applying the findings to ancient material. All of this will, of course, involve a multitude of scientific and social science disciplines that will make key contributions to our overall comprehension of the device.

**Key Issues/Current Debates**

**Emergence of Innovation**

It is commonly assumed that there was an evolutionary progression from rotating devices to turntables to the wheel, as potters gradually acquired the skill to harness rotational kinetic energy ever more effectively. The eventual invention of the potter’s wheel is traditionally linked to the onset of mass production, with the wheel specifically acting as a device to speed up production and produce standardized shapes (Childe 1954; Nissen 2006; Saraswati and Behura 1966: 16). However, while scholars recognized that the wheel does of course speed up production (Arnold 1985: 208), recent work in Egypt and
the Near East has shown prestige and technical exclusivity – rather than speed – to have been the driving forces for the emergence of the wheel (see also Thé et al. 2017 for central Europe and Crewe and Knappett 2012 for Cyprus; Choleva 2018 for mainland Greece; Berg 2007 for Melos). The marketization of speed and commercialization of the wheel are later developments (Foster 1959a; Streily 2000: 233).

Evidence of the social context of the emergence of the potter’s wheel in Egypt has been collated by Doherty (2012). The earliest credible scenes of potters using potter’s wheels can be found in the Tomb of Ty at Saqqara (Fig. 5) and Tomb of Ptahshepses at Abu Sir dated to the 5th Dynasty of the Old Kingdom (ca. 2500–2300 BC). Statuettes, models, and written manuscripts also date back to this period and, together, indicate that these potters were under the control of Egyptian royalty and nobility. First evidence of wheel-thrown pottery is linked to the 4th–5th dynasties (2600–2300 BC) when it became popular for Pharaohs to build monumental pyramids which incorporated chapels dedicated specifically to the nourishment of their spirit (ka) in the afterlife. Daily liquid and solid offerings to the Pharaoh’s ka were made in miniature, wheel-thrown cups produced in vast amounts. Prior to the introduction of the potter’s wheel, specialist potters already produced standardized funerary vessels at a large scale mainly using the mold technique. Increasing the production could easily have been achieved by adding more workers. In contrast, the first pottery produced on the wheel consisted of shapes exclusively used for the Pharaoh’s funerary state-controlled activities before gradually being disseminated into private elite contexts. The elite meaning associated with the potter’s wheel is further encapsulated by the use of basalt in the construction of the wheel bearings, a prestigious and rare stone requiring the expertise of stone masons and previously exclusively used in the manufacture of religious statuary.

An exclusive elite craft context for the use of the wheel is also observed in the southern Levant where the potter’s wheel is first used during the Late Chalcolithic (4500–4000 BC) for the manufacture of V-shaped bowls, small ceremonial bowls used in ritual activities. Knowledge of the potter’s wheel ceased immediately following the collapse of the societies, and the technology only reemerges centuries later (Baldi and Roux 2016; Roux 2003). Mass production does not appear to have played a role either in northern Mesopotamia where wheelmade bowls make up less than 1% during Late Chalcolithic 2 (3900–3800 BC) at Tell Feres al-Sharqui. Similar to the Levant and Egypt, most of the bowls were found in a central elite building. Importantly, these bowls were made in by wheel-coiling rather than wheel-throwing (Baldi and Roux 2016).

Adoption of Invention and Transmission of Technology

Invention of a product or devices does not automatically guarantee its successful transmission. This also applies to the potter’s wheel where scholars have observed both the disappearance of the technology after initial use and widespread adoption. The former scenario is exemplified by the aforementioned Late Chalcolithic ceremonial V-shaped bowls from the southern Levant. When these Chalcolithic cultures collapsed in Early Bronze I (4th mill BC), wheelmade pottery also vanished. It only reemerged in Early Bronze II–III (3rd mill BC), though only a small number of vessels were made with this technique and there is no spread of the technique beyond the confines of a restricted set of specialists. At the end of the 3rd millennium BC (Early Bronze IV), cities collapsed and wheelmade pottery disappears again, only to reappear a few centuries later to establish itself as the dominant pottery forming technique by Middle Bronze II (mid-2nd mill. BC) (Roux 2010).

Invention of the potter’s wheel followed by keen widespread adoption is visible on Bronze Age Crete (Fig. 6). Here, experimentation with the potter’s wheel in Early Minoan III/Middle Minoan IA leads to its adoption in Middle Minoan IB where it is used in the making of cups, in particular. The initial use is widespread and immediate, extending to palatial and non-palatial sites across the entire island, although it takes several centuries for potters to acquire the necessary know-how to also make large pots on the wheel (Crewe and Knappett 2012).
**The Potter's Wheel, Fig. 5** Tomb of Ty, Saqqara, Egypt, showing potter working on a wheel (c. 2450–2300 BC). (After Doherty 2012: Fig. 2.2)

**The Potter's Wheel, Fig. 6** Reconstruction of Minoan potter’s wheel. (After Evely 2000; Morrison and Park 2007/8)
As these two case studies show, adoption scenarios of the wheel can range from widespread to abort. Roux (2010) offers an explanatory framework which examines to what degree innovation systems are fragile/robust or closed/open. She argues that the transmission of an innovation is, in part, dependent on the size of the network, skill level and production context of the craftspeople involved. Fragile technological systems are restricted in the number of participants and therefore cannot withstand transformations of the societal structure. In contrast, robust systems have transmission networks sufficiently large to weather any socioeconomic storms. Closed systems have a strong relationship between the producers and the technological task, but do not interact with other production units. Open systems are characterized by transfer and borrowing between production groups.

In the context of V-shaped bowls, specialists were few in numbers, highly skilled, attached to elites, and producing pots specifically for elite consumption. When these elites collapsed, so did the production of the special function V-shaped bowls, leading to the disappearance of the potter’s wheel. The system here was fragile and closed, leading to an interrupted development. In contrast stands Minoan Crete where the skills were widespread among a highly skilled, large potting community that served both palatial and non-palatial consumers. As a consequence, the potter’s wheel flourished. The Cretan scenario is thus representative of a robust, open system with a linear pattern of transmission.

A number of additional factors have been referenced to explain the failure of adoption of the wheel in various contexts across the world. Arnold, for example, recounts the efforts of the Mexican government to increase the efficiency and quality of pottery production in the town of Ticul in the 1930s (2008: 238–242; also Arnold 1985: 222–223). At this time, local potters were using the k’ab’al, a traditional turntable, to make pots. Despite sending an experienced potter who ran a workshop with five kick wheels for 4 or 5 years, the potter’s wheel was not adopted by the local community of potters. The disadvantages highlighted were (a) the price of the wheel which was well beyond the reach of a local potter’s income, (b) the local clay was considered too coarse and unsuitable, (c) potters were used to working barefoot which resulted in abrasions and injuries of their feet when kicking the fly-wheel, and (d) the wheel was incompatible with existing motor skills and used different muscle groups. In addition, the organizational setup, including the sexual division of labor, may be inconsistent with the new technique. For example, the introduction of the potter’s wheel in Guatemala was unsuccessful, argues Arnold (1985: 222–223), because pots had traditionally been made by women on a part-time basis alongside other household activities. When the wheel was introduced, it led to no change among women potters. Instead, the wheel became an entirely separate craft sphere performed by men. Strict social sanctions against innovation can also prevent change. Such sanctions were observed in Ch inertia, Guatemala, between the 1950s and 1970s and led to a strict replication of the traditional pottery repertoire and strict prohibitions on innovations. Unfavorable industrial conditions may also make adoption less likely – Rajasthan potters mentioned the frequent power cuts that interfered with the use of their electric wheels (Kramer 1997: 62).

However, the potter’s wheel, when used for proper wheel-throwing, can also bring many advantages. It produces even and symmetrical vessels, it allows the production of a vessel in a matter of minutes and can thus maximize turnover, and it speeds up mean production times – Arnold (2008: 244) estimates that a wheel can make production between twice and five times faster than a turntable or mold – although this theoretical increase in production speed must be weighted against a greater time investment at other points during the manufacturing sequence, such as collection and preparation of finer clay. Most importantly, however, for an adoption to be successful, the motor habits and work position must be compatible with previous practices. Foster therefore notes that it is often easier to train non-potters in a new technique than converting experienced potters from a traditional technique to wheel-throwing (1959a). In addition,
Thér and his colleagues have highlighted the performative aspects of wheel-throwing, such as the rotation of the wheel, the gradual shaping of the vessel, the obvious grooves on the surface, which can appear highly attractive, if not magical, to the non-specialist when watching the manufacturing process or when touching the final product (2017).

The advantages of the potter’s wheel are less clear-cut when the power of rotational kinetic energy is not understood or when RKE is not used to its full potential, for example, when the wheel is used more like a smoothly running turntable or when pots are created in stages, as is typical for wheel-coiling (Foster 1959a: 100–109; Arnold 2008: 242–243) (Fig. 7). The use of the potter’s wheel for wheel-coiling is a common phenomenon in the Old World where scholars have argued that the first use of the wheel was actually to make wheel-coiled vessels rather than wheel-thrown ones (Choleva 2018 for prehistoric Greece; Thér et al. 2017 for Iron Age Europe; Jeffra 2013 for Minoan Crete; Roux 2010 for the Near East). Roux (2010) conceptualizes the emergence of the potter’s wheel in two stages: its initial use was for wheel-coiling and, later, for wheel-throwing. Because the potter’s wheel, even when used incompletely for wheel-coiling, introduces an entirely new physical principle, it represents a jump in the history of innovations. It is a “discontinuous innovation” because potters would have to acquire an entirely new set of motor skills to use a device that retains RKE for long periods of time using entirely different hand motions (Roux 2010). Because new motor skills need to be developed, scholars have stressed the importance of a face-to-face interaction to ensure complete transmission of the innovation – learning how to throw sections of a pot, even if they were coiled first, requires the acquisition of cumulative bimanual skills (Roux and Corbetta 1989) through a lengthy apprenticeship. Being a highly complex skill, developing a high level of expertise in wheel-throwing is estimated to take up to 10 years (Ericsson and Lehmann 1996). On the positive side, when an experienced wheel-throwing potter is confronted with a different wheel or new shapes, they are able to adjust to these challenges easily by applying and, if necessary, modifying existing hand positions (Gandon and Roux 2019). Wheel-coiling skills, in contrast, are less demanding but may still require a lengthy period of direct interaction between expert and learner.

If we accept that the first potter’s wheels were not exploited to their full potential, then this realization provides additional support that the introduction of the wheel was unrelated to the desire for mass production or a more standardized product – both of which require that the potter’s wheel was utilized to its greatest potential. Thus, as Foster (1959a: 104, 109) would argue, it was not the wheel itself that brought about technological or social change, but rather acted as a device that could be utilized to implement change already in motion.

**International Perspectives**

The potter’s wheel can be found in all corners of the world. The specific design may vary, but the applied principles remain recognizable. As we have seen above, it was invented in the 5th millennium BC in the Near East (Roux 2010) and spread across the Mediterranean and north and eastern Europe during the Bronze and early Iron Ages (Thér et al. 2017; Crewe and Knappett 2012; Doherty 2012). It is widespread in Asia, though the precise date of introduction is unclear. In the Americas, the wheel was first introduced by the Spanish (Arnold 2008: 238).

Scholars normally assume that wheel was introduced in a supposed evolutionary sequence from bat to pivoted turntable to simple wheel to double wheel. However, it has become amply clear that the wheel often was not immediately used to its full potential, and hence the period of initial innovation and stage of widespread use do not typically overlap. Likewise, it is commonly observed that the different devices are used simultaneously within the same cultural setup.

As Foster (1959a: 116) already recognized some time ago, one of the great mysteries of history is the potter’s wheel’s well-established correlation with male potters. Worldwide ethnographic studies have shown that 80% of
traditional potters are female. Nevertheless, the introduction of the wheel almost always leads to the involvement of male potters with women continuing to manufacture vessels by traditional hand-forming methods in the home. When women use the wheel, it is for wheel-coiling only (Vincentelli 2003). The proverbial exception to the rule are female potters from El Porvenir in Honduras who – due to limited agricultural potential, men’s long absences from the community, and easy access to potting resources – took up wheel-throwing commercially to ensure the financial survival of their households (Mouat and Arnold 1988). Whether the typical gender division also applies to prehistoric potters is a matter of speculation. Foster (1959a: 116) hypothesizes that this may be due to the physical strength that is required to set and keep the wheel spinning and throwing heavy clay. However, given the evidence of modern female artisan potters, the involvement of women in many other physically strenuous stages of the pottery production, and women’s general participation in demanding tasks, such as agriculture, textile manufacture, and childcare, this argument seems unviable (Rice 1987; Kramer 1985). Instead,

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>Handmade</td>
<td>Pinching</td>
<td>Squeezing a clay ball between fingers and thumb, and then thinning the walls. Mostly used for small open vessels; can also be used to begin the base of larger vessels or as a finishing technique to even out walls.</td>
</tr>
<tr>
<td></td>
<td>Drawing</td>
<td>Starting from a lump of clay, the walls are pulled or squeezed upwards with the hands to create the desired shape. Frequently combined with coiling where coils are pulled up in stages.</td>
</tr>
<tr>
<td></td>
<td>Coiling</td>
<td>Rolls of uniform thickness are created and then used to build up the vessel shape. The pot may vary in wall thickness along the horizontal and/or vertical axis and coil seam junctures. Often combined with other techniques, such as drawing or wheel throwing.</td>
</tr>
<tr>
<td></td>
<td>Slab building</td>
<td>A vessel built up of joined flat slabs. Particularly suitable for large vessels.</td>
</tr>
<tr>
<td></td>
<td>Molding</td>
<td>A flat ‘pancake’ of clay is prepared and placed into a plain or decorated mold. As the clay shrinks away from the mold, it retains the desired shape.</td>
</tr>
<tr>
<td>Wheelmade</td>
<td>Wheel coiling</td>
<td>Rotational kinetic energy (RKE) is applied to a vessel originally made of coils and can be introduced at different stages of the forming process. At its most basic, pots are made by coiling and then thinned or smoothed on the potter’s wheel. At its most advanced, a coil is added and ‘thrown’. Common features mirror those of wheel-thrown pots, but are less continuous and regular.</td>
</tr>
<tr>
<td></td>
<td>Wheel throwing</td>
<td>The potter’s wheel runs at speeds sufficiently high to develop RKE which is used by the potter to pull up and shape the clay with bilateral movements.</td>
</tr>
</tbody>
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The Potter’s Wheel, Fig. 7  Common forming techniques with and without use of rotational kinetic energy
Kramer (1985) suggests that economic aspects interact with religious or ideological traditions, such as supply and demand patterns, employment types, household organization, access to raw material resources, capital and time, apprenticeship patterns, or the need for mobility and visibility of potters. Arnold (1985: 99–108), in contrast, draws attention to the strong relationship between men and agricultural activities, arguing that, when this link is broken, men will turn to alternative income-generating resources, such as wheel-throwing, while women remain associated with household tasks and handmade production which are more easily scheduled around agricultural and childcare tasks.

Cross-References

- Ceramics: Scientific Analysis
- Ethnoarchaeology: Approaches to Fieldwork
- Ethnoarchaeology: Learning from Potters in Gilund
- Experimental Archaeology
- Technological Studies in Archaeological Science

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**Further Reading**


