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Of the various ceramic construction methods, throwing on the potter’s wheel is the most common in Western, European-based culture. For producing large quantities of individually handmade functional wares it is the most efficient method. It is important to consider, however, that the potter’s wheel is a machine and by its very nature tends to impose a mechanical symmetry and precision that you may not want. Think carefully about this, explore all options for thrown and altered form, and consider handbuilding options as well. In Eastern cultures mastery of the potter’s wheel gives license to alter and distort the form, rather than to leave it in its most mechanically perfect condition. It is possible to create forms on the potter’s wheel that show minimal evidence of the human hand, and that may be your choice, but if we inadvertently allow the wheel to influence us in this direction, we do a disservice to ourselves and our craft. Some of the most exciting wheel-thrown work today is done with soft clay on a slow wheel, showing the great skill of the potter, but it also shows the marks of the process and the natural irregularity of organic form without excessive mechanically imposed symmetry and precision.

This section will help you become familiar with the basics of throwing on the potter’s wheel and/or help you show others the techniques. In either case, plan on devoting a great deal of time to practice and skill development, and review the suggestions and guidelines in this chapter frequently. Read and reread all the information very carefully to ensure that you are not overlooking any part of the process. There are so many separate steps and important
moves to keep track of, and frequent reviewing will help you master the complete process much more quickly and smoothly. As you become thoroughly familiar with these descriptions and guidelines, the actual physical process will come much more easily. For best results and speedy progress, work on your throwing for an hour or two as frequently as possible, preferably every day. Once you become comfortable with throwing, or with teaching throwing, you will no doubt modify certain steps to suit your own body geometry and individual inclinations. It is the nature of throwing that no matter how you are taught, much of what you eventually accomplish is learned by the seat of your pants. Allow this to happen, and be ready to adapt your methods at all times.

A traditional approach to throwing involves completion of the pot upon the wheel so that very little needs to be done afterwards to finish the form. This is especially true of certain jar, vase, bottle, and bowl forms. Even if a trimmed foot or a knob is needed, we often use the wheel for those tasks as well. It is a joy to use the wheel in this way, but consider also that the wheel is an extremely versatile tool for making component parts to be assembled off-wheel into vessels or sculpture. The wheel excels for making hemispheres, spheres, ovoids, flat disks, cylinders, cones, tubes, and a myriad of other shapes. All of these components can be assembled in an unlimited number of ways. If you do not explore these possibilities, you are missing one of the best things that the wheel can do.

### Choice of Wheels and Seats

There are almost as many opinions on types of wheels as there are potters. As an individual potter or teacher, it is important to simply consider your needs and the needs of your students. Types of wheels will be discussed at greater length in Chapter 10, “Studio Design, Setup, and Operation.” For now, consider the physical implications of different kinds of wheels. Some teachers believe that students should initially learn on a kick wheel. Personally, I believe exactly the opposite. It is hard enough to learn to throw without having to power the wheel with your foot. At the same time, beginning students often have a hard time controlling the speed of a power wheel, and the teacher must be very diligent in restraining “lead-foot” inclinations.

Some power wheels are appropriate only for people of very small stature. It is actually difficult to find a power wheel with an ergonomically correct operator position. Most power wheels are mounted much too low to the ground. It is far healthier to be sitting on the front edge of a slightly-forward-slanted bench-type seat, with the thighs slanted downwards. This means that for the average person, the wheelhead should be approximately 24” to 30” off the ground. Needless to say, the only wheels made to these measurements are kick wheels and treadle wheels. My own wheel is adapted from the design of a popular Japanese power wheel, except I built it to fit my tall frame. I can throw all day long without getting cramped.

Some power wheels do offer height adjustment options, and it is possible to adapt almost any wheel for different throwing heights. In any case, make sure you have a comfortable bench or stool. Ideally, the seat should be tilted forward slightly. Almost any existing bench or stool can be adapted to provide this tilt, and many potters choose to make their own throwing stool or bench. See Chapter 10 for more information on stools.

For the full-time studio potter, there are many important criteria in selecting the type of wheel. Many potters prefer the rhythm and ease of the kick wheel or treadle wheel. There is something very meditative about the gentle swinging motion of the foot on a traditional Leach-style treadle wheel. Also, many contemporary potters agree that power wheels encourage the potter to throw with the wheel turning much too fast, whereas slower throwing speeds decrease our reliance on the mechanical symmetry imposed by the power wheel.

For anyone experiencing back problems, it is a good idea to use a mirror to observe the developing profile of the pot, and it may be far healthier to throw standing up. See the section on taking care of your back in Chapter 9, “Studio Safety and Sensible Studio Practice.”
Throwing Right-Handed vs. Left-Handed

In Japan potters traditionally throw with the wheel turning clockwise, whereas in the West we throw counterclockwise. You may choose to follow either tradition, but the decision of whether to throw with the wheel turning clockwise or counterclockwise should have nothing to do with whether you are right-handed or left-handed. In throwing, both hands must do tasks that involve great dexterity and control, and it matters little which tasks are done with which hand. If you are left-handed, you have nothing to gain in learning to throw completely backwards from the way everyone else is throwing. There is no advantage in it, and much disadvantage.

Wedging and Preparing Balls of Clay

Successful throwing always begins with properly prepared clay, and the primary step is the wedging process. If you are not familiar with wedging or need help with the wedging process, see the section on wedging in Chapter 2, “Handbuilding.” Wedge plenty of clay, and divide into fist-size balls. When you are learning to throw, never sit down at the wheel with fewer than 10 balls of clay. It is essential that you abandon the preciousness of the individual pot. If you sit down with only two or three balls of clay, there may be an unconscious desperation to make every pot a success, no matter how much fiddling is required. That is never productive. When learning to throw, work on a form only as long as the work is going well. As soon as it starts to go bad, scrap it and start another one. You will accelerate the learning curve and accomplish far more.

Clay Consistency

Don’t waste time with clay that is too hard or too soft. It is impossible to describe exactly, but you will quickly learn the ideal clay consistency. Clay that is slightly on the stiff side may seem more manageable for the beginning potter. It will maintain its structure longer before water absorption turns it to jelly. At the same time, clay that is too stiff is unresponsive, and over time can be very hard on you physically, especially when throwing larger forms. Clay that is too soft will not maintain its physical structure. It settles down as you lift it up, and it moves outwards in response to the centrifugal force of the spinning wheel. Work with clay of varying consistency, and continue to experiment as your throwing skills improve. Subtle differences in clay consistency and moisture content will have a major impact on the performance of the clay on the wheel. For the experienced thrower, well-aged clay that is slightly on the soft side is very responsive and, if thrown quickly, will maintain its physical structure.

Correct Position for Centering

Centering the clay is not a matter of muscular strength. It involves using the weight of your upper torso and the muscles in your hips and back, which are very powerful muscles. Move your stool in very close to the wheelhead, as shown in Fig. 3.1. Before starting the wheel and attempting to center the clay, estab...
lish your position and try the following movements to ensure that your position and distance from the wheel are correct. Hold both hands as you would if shaking hands with someone but with your wrists pressing together at the base of the thumb, and wrap your hands loosely around the slap-centered lump. Throughout the centering and wheel-wedging process, pretend that your hands are permanently connected at the base of the thumb. Your hands can hinge and swivel at this point, but they should remain firmly connected there in order to give the appropriate stability and cross-bracing. See the series of images in Fig. 3.3.

*Do not* allow the upper edge of your hands (at the base of the index finger) to close down against the clay, as this can cause the lump to flatten against the wheelhead once you begin centering the clay. The primary force of throwing is across the wheelhead, not down against it. Keep your hands in a vertical, shaking position, but with fingers wrapped around the lump. Maintaining this hand position, lean your right elbow into the crook of your right thigh (where it meets your torso), and lean your left elbow against the top or your left thigh. Lean down on your elbows with the full weight of your upper torso. Try rolling your hips forward. This movement should force the palm of your right hand against the lump of clay. It is the base of your right hand that does almost all the work in centering. As long as your elbows are locked in place as just described, you will have a great deal of force at your disposal simply by rolling your hips forward. If you cannot get your hands to apply force against the clay when you roll your hips forward, it indicates that you are not sitting close enough to the wheelhead. Practice this position until you are comfortable with it.

**Centering**

The purpose of the centering process is to shape and compress the clay into a symmetrical mass perfectly centered in the middle of the wheel. Proper centering is essential to good throwing. Before placing a lump of clay on the wheel, it is essential to prepare the wheelhead. Clay sticks best to a surface that is slightly damp but not wet. Squeeze some water over the wheelhead or bat, scrape off any clay residue, and squeegee off all water with a stiff rubber rib. If the surface is rough, as with a weathered wood bat, use an old towel to remove all moisture that the rubber rib does not remove.

When the wheelhead (or bat) is ready, slap a ball of clay down in the center of the wheelhead. Before starting the wheel or applying any water, roughly center the ball, slapping it from both sides with your hands (Fig. 3.2), rotating the wheel with the pressure of your hands (or with foot if a kick wheel), sealing the edges down against the wheel with the lower edges of your hands. By this method you should be able to slap center the lump quite accurately.

When you are sure that your position is correct as described, squeeze some water over the lump, bring the wheel up to full speed, place your hands as described (*be sure that your two wrists are pressing together at the base of the thumb*), anchor your elbows, roll your hips forward, and lean into the lump (Fig. 3.3). *Be sure* that you are leaning firmly down on your elbows and that your right elbow is locked in the crook of your right thigh. This should prevent your arms from bouncing back and forth with the irregularity of the clay. If all goes well, the irregularity and asymmetricality of the lump of clay will simply disappear, and your hands wrapped around the lump will remain completely still as the centered lump spins. As you are centering, rest your thumbs across the top of the lump, and apply moderate

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**SLAP CENTERING**

*Figure 3.2 Slap centering. Seal the lump down with the lower edge of your hands while the wheel is turning slowly.*
a. Centering and wheel wedging: Initially center the clay with firm side pressure.

b. Profile of properly centered lump.

c. Continue the side pressure while hinging hands together, causing clay to rise.

d. Cross section showing intermediate stage of wheel-wedging.

e. Raise the lump to a rounded peak.

f. Cross section showing maximum rise, with heel of thumb poised to press clay back down.

g. With continuing side pressure to prevent mushrooming, press clay back down.

h. Continue pressing downwards as lump widens.

i. Finalize centered form after repeated wheel-wedging.
downwards pressure with them. As mentioned, the primary pressure in centering is applied across the wheelhead, rather than down against it, but some pressure from above with the thumbs is necessary to consolidate and center the top of the lump. Pressing down against the wheelhead with the edge of your hands is wasted effort, and with a gritty clay body it can erode the skin surface in a hurry.

While centering it is essential to maintain a wide “footprint” at the base of the lump. Avoid digging the lower edge of your hands too deeply into the base of the spinning lump, as this can cause it to come off the wheel. Throughout the centering/wheel-wedging process maintain this wide footprint.

Aside from purposeful altering or distortion of a thrown form, usually after the throwing process is completed, it is normal to avoid touching the lump of clay or partially formed pot unless the wheel is turning. Never apply force to the clay until the wheel has started, and always release pressure gradually while the wheel is still turning. Pulling your hands away suddenly will throw the lump off center or damage the pot. Similarly, stopping the wheel while you are still applying force will distort the clay. Also, throughout the throwing process, whenever possible keep your hands connected together at some point, so that your arms “cross-brace” each other, stabilizing the hands, and giving you much greater control.

As you are centering, if the lump remains irregular and off center, you are lacking either force or stability. Make sure you are leaning hard against your thighs, and make sure that you are sitting close enough to the wheel so that when you roll your hips forward the power is transferred through your forearms to the spinning lump of clay. In some cases, it may be necessary for you to draw your elbows close together in front of you and lean directly against them. As you try to center, think about your body position, and observe to see if your arms are moving back and forth. A little observation will show you what you are doing wrong. If the process is done properly, with your elbows leaning firmly against your thighs, and with the full weight and force of your body behind them, you will be able to muster a very powerful force, easily capable of centering the soft, malleable clay.

During the centering/wheel-wedging process, if a flange of clay seems to spread out at the base of the lump, it is because you are applying too much force downwards against the wheelhead. If this tends to happen, use the square corner of a wooden rib to scrape off this flange of clay. Make sure you are applying the primary force across the wheelhead, and make sure that you maintain the “handshaking” position, with open spaces between the lump and the upper edges of your hands.

Always center at medium to high speed, and apply water as often as is necessary to lubricate the clay. As you are developing your skills, it is advantageous to try and complete the centering and wheel-wedging, processes as quickly as possible. This reduces the amount of water absorbed by the clay, retaining its structural stability. Also, if the surface of the lump becomes increasingly gritty as you are centering and wheel wedging, it simply means that the water used for lubricating is washing away the clay particles, leaving the sand behind in higher concentration. It will feel rough, but it doesn’t hurt anything, and as you learn to center faster this will no longer happen. Remember one of the cardinal clay commandments: clay appreciates a vigorous commanding approach. Do not be afraid to push hard. The worst that can happen is that you will push the clay right off the wheelhead, but you will also learn what works and what doesn’t.

Wheel Wedging

Clay is composed of microscopic flat particles called platelets. After hand wedging, these platelets are aligned in random “currents,” throughout the lump of clay. On the wheel, if you only center the outside of the lump, the platelets within the lump will still be oriented in random “currents,” which work against you and create irregularities as you attempt to form a vessel. The wheel-wedging process in effect centers and twists the lump all the way through to the inner core, leaving the platelets in symmetrical spiral “currents,” perfectly prepared for the throwing process. As in centering, wheel wedging should be done at medium to high speed, and the clay should be lubricated frequently with water. As
you are centering, lift your hands slowly, and at the same time close them together gradually, hinged at the base of your palms, as indicated in Fig. 3.3. As explained previously, keep your hands connected at the base of the palms throughout the throwing and wheel-wedging processes. As you lift, keep moderate pressure with your left thumb across the top of the lump in order to prevent the formation of a depression in the center that could trap slurry, causing problems later. As you work the clay upwards in one continuous movement, closing your hands together, you should produce a tall cone-shaped mass of clay. While still pressing against the side of the lump with your right hand, allow the ball (base) of the thumb of your left hand to slide up on top of the lump and push the lump back down into a lower, wider mass. Retaining side pressure with the right hand is important, because it will prevent the lump from mushrooming when you press it down from above. Repeat the wheel-wedging movement at least three or four times. As you do this you will feel the clay become more responsive to the pressure of your hands.

Penetrating the Lump
After the clay mass is well centered and wheel-wedged, you are ready to begin forming a vessel. As you proceed, be sure to consult the images in Figs. 3.4 and 3.5 (on page 48). With the wheel still running at high speed, lubricate the spinning lump, wrap your hands around either side for stability, and with the tip of one thumb create a dimple in the center of the top. When working with a small lump of clay, squeeze some water into that dimple, and simply continue pressing the thumb down into the lump, creating a narrow V-shaped opening in the center of the lump. Stop when the tip of your thumb is about ½” from the bat or wheelhead.

When working with a larger lump, after squeezing water into the dimple slowly press one finger of your left hand (the second finger with the index finger twisted around behind it to back it up works very well) down into the center of the lump, holding the finger at a slight angle, and keeping the fingertip right on the center axis as you press down, again producing a V-shaped hole. Keep your right hand wrapped around the right side of the lump for stability, and use the left side of your right thumb as a steady rest and guide, sliding the fingers of your right hand against it as they penetrate the lump. Stop pressing down into the lump when your fingertip is approximately ½” from the wheelhead.

Measuring the Thickness of the Bottom
The decision of how thick to leave the bottom of a pot depends on whether or not you plan to trim away any clay from the bottom. Until you develop an accurate sensitivity to bottom thickness, it is worthwhile to check it at this point. Hold your needle tool in one hand with the index finger against the base of the needle. Poke the needle tip through the inside bottom of the “vessel” until it touches the wheelhead or bat surface, and slide your index fingertip down along the shaft of the needle tool until it touches the bottom of the “vessel.” Lift finger and needle tool out together. The distance between your fingertip and the end of the needle tool gauges the thickness of the bottom. You can use this system whenever you wish during the throwing process to measure the thickness of the bottom of a pot. If you plan to trim the bottom, it should be at least ¾” to 1 ½” thick. If you are not going to trim the bottom, ¼” thickness is adequate for small and medium-size vessels.

The Claw—Widening the Bottom
Slow the wheel down a bit for this operation. As your skill develops, you may wish to do the penetrating and claw (widening) steps in one continuous movement with the wheel at high speed. Squeeze water from your sponge over the spinning lump so that it flows down over the inside and outside walls. With your right hand wrapped around the right side of the lump for stability, place the second finger of your left hand into the hole in the lump, with the finger tip touching the bottom of the hole and with your index and ring fingers “backing up” the second finger, providing more strength and rigidity. Keep the edge of your left index finger resting against the side of your right thumb for stability (with right hand still wrapped around lump), and move your three
**Figure 3.4 THROWING**

a. Basic throwing: After centering and wheel-wedging, form a dimple and apply water.

b. Penetrate the lump to create a V-shaped opening.

c. Widen the bottom using the "claw" motion, and compress the bottom.

d. Begin lifting the walls.

e. Maintain firm, even pressure and steady upwards movement.

f. Stop lifting just shy of the rim.

g. Compress the rim.

h. Begin second lift, pressing into the clay at the base.

i. Continue lifting slowly and steadily up to the rim.

j. Repeat with the third lift.

k. Begin shaping vessel as you lift.

l. Think about the shape as you follow through.
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Figure 3.5 THROWING CROSS SECTIONS

a. Cross sections of basic thrown form: Creating the dimple.

b. Penetrating the centered lump.

c. Widening the bottom.

d. The initial lift.

e. Stop just shy of the rim.

f. Second lift, pressing into the base.

g. Proper position during lifting, with inside fingers slightly ahead of outside fingers.

h. Final lift.

i. Resolving the shape.
left fingers (together as described) towards you in a claw motion, so that you widen the inside and bottom of the “vessel” without widening the opening at the top. As you widen the bottom try to keep it as level as possible. If you end up with a raised bump or “pedestal” in the center of the bottom it is because you are pushing down as you widen the bottom. If you end up with a concave cross section across the bottom it is because you are lifting up your fingers as you widen the bottom. Avoid both these circumstances, trying instead for a flat uniform bottom. There are circumstances where you will want a curved bottom, but for the sake of skill development it is good to work on creating uniform flat bottoms.

Recentering
During the latter part of the “claw” movement many potters will squeeze with the left hand and apply slight pressure against the outside of the “doughnut” with the right hand. This is called “recentering,” and some people find it helpful in ensuring a uniform “doughnut” before proceeding with lifting the walls. In my experience, if initial centering, wheel wedging, penetrating, and widening are done correctly, recentering usually is not necessary.

Compacting and Leveling the Bottom
When you widen the bottom you are pulling clay away from what remains as the bottom of the pot, whereas during subsequent lifting you will be compressing the walls of the vessel from both sides. If the bottom remains uncompressed, it will shrink more than the walls, and S-shaped cracks may form during drying or firing. To avoid this, apply mild fingertip pressure against the spinning bottom, moving from the center to the right edge and back again several times. This is also the ideal time to level any irregularities in the bottom.

Lifting the Walls
If all has been done correctly up to this point, you are at what is called the doughnut stage, ready to begin lifting the walls. Hold both hands as you would to shake hands with someone. Bring them together, and cross and lock your thumbs together, creating what we call the caliper position. Bend your fingertips slightly inward. If you bend them too much you will rake clay off the surface, and if you bend them too little you will be working with the flats of your fingers and will have little control. With your hands held in this caliper position, you have formed both a lifting tool and a measuring device, and during the lifting process it is important to always think of your hands as not only moving and thinning the clay, but also constantly gauging the thickness of the walls. Bend your hands/caliper downwards at the wrist. It will feel awkward initially, but you will get used to it quickly. While undertaking the lifting process, keep your elbows resting on your thighs or tucked in against your torso for stability.

When you have experimented with this position, bring the wheel to medium speed and squeeze your sponge above the rim of the spinning vessel so that water flows down both inside and outside. Lower your hand/caliper over the right-hand wall of the vessel, with your left hand inside and your right hand outside. From this point on, always work on the right-hand side of the vessel, where the clay is moving away from you. With the wheel at medium speed, close your hand/caliper so that your slightly-bent fingertips press against the lower extreme of the walls inside and outside, and slowly lift your hands. During the very first lift, the wall at the base of the vessel will be considerably thinner than the doughnut above it, so do not apply significant pressure until you come up against the doughnut, but at that point increase the pressure and continue lifting. In the first lift, you should be able to raise the doughnut, producing a uniform wall approximately ½” thick. The most common fault at this point is to apply too much pressure beneath the doughnut, so that the lower walls are thinned too much and no longer have the strength to withstand the torque necessary to thin the walls above.

As you lift, your fingertips should leave very gradual spiral marks up the side of the vessel. Stop just short of the lip of the vessel. If the size and shape hasn’t changed at all in the first lift, you are not pressing hard enough. Always lift in one continuous pass from the bottom to the top, and between each lift always
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and distorting the pot. This is important, but you will notice that the rim may remain quite thick, and there is also the chance of cracks forming as the diameter of the rim expands and more water soaks into the clay. To avoid cracks, after every few lifts compress the rim with your sponge or fingers, gently pressing against both sides and the top. At the same time, if the rim is too thick you may increase the pressure enough to thin it down. Throughout the lifting process it is an excellent practice to keep the rim a little thicker than the walls. The thicker rim will reinforce the form during throwing and give you the option for a thicker rim on the finished pot. You may choose to thin the rim during the final stages of throwing. Also, when throwing covered jars, one common lid system involves a lid gallery in the rim of the pot, which requires that you throw the pot with a very thick rim. It is best to get used to a thicker rim early on, for all of these reasons.

Trimming Excess Clay or Irregularity from the Rim

If the vessel is lopsided and the walls are thicker on one side, you can carefully and purposefully lift the walls so that the irregularity is all moved to the rim, and then trim off the irregular portion. Hold the needle tool in your right hand, with the needle pointing in the direction of wheel rotation. Avoid cutting with the needle vertical to the clay surface, as this will tend to rip the clay. Hold a finger of your left hand inside the vessel in a spot corresponding with the tip

As you are lifting the walls, if you encounter small hard bumps in the clay, they are either foreign objects (like a small piece of sponge or fired clay) or air bubbles. Poke your needle tool into the bump. If the needle goes right through, it is probably an air bubble. When you do your next lift the air will squeeze out through the hole left by the needle tool. If the bump is a foreign object, then you must decide whether to leave it or remove it. If it is very small you may choose to ignore it, but if it is large you can remove it and press a small piece of clay into the hole.

Lubrication While Throwing

As indicated above, it is essential to squeeze water over the lump when centering and over the walls of the pot while lifting. But excessive water is your enemy while throwing. As long as the clay is wet, it is absorbing water, which spreads the particles apart, softening and weakening the clay. It is imperative that you use only the necessary amount of water and that you work on throwing as quickly as possible. Some potters hold a sponge in the fingertips or under their thumb while throwing, enabling them to feed water onto the surface during each pull.

As soon as you have a vessel you wish to keep, remove all water from the bottom, as explained below.

Compressing the Rim

As mentioned above, each time you lift the walls, stop just short of the rim in order to avoid the likelihood of your fingers slipping off the rim and distorting the pot. This is important, but you will notice that the rim may remain quite thick, and there is also the chance of cracks forming as the diameter of the rim expands and more water soaks into the clay. To avoid cracks, after every few lifts compress the rim with your sponge or fingers, gently pressing against both sides and the top. At the same time, if the rim is too thick you may increase the pressure enough to thin it down. Throughout the lifting process it is an excellent practice to keep the rim a little thicker than the walls. The thicker rim will reinforce the form during throwing and give you the option for a thicker rim on the finished pot. You may choose to thin the rim during the final stages of throwing. Also, when throwing covered jars, one common lid system involves a lid gallery in the rim of the pot, which requires that you throw the pot with a very thick rim. It is best to get used to a thicker rim early on, for all of these reasons.

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of the needle tool. With the wheel at slow-medium speed, touch the needle tip against the outside of the pot just below the lowest point in the rim and swing the tip of the needle gently into the clay until the tip touches your finger on the inside of the pot. At this point allow the vessel to turn one more full revolution. Remove the needle tool, stop the wheel, and lift off the cut ring. When you get good at this process you can lift off the trimmed potion as soon as you feel the needle touch your finger, with the wheel still turning.

**Skill Development with Cylinders**

No matter what your skill level, one of the best ways to develop your ability on the wheel is to throw lots of cylinders. As you complete each one, cut it in half vertically with your cut-off wire to observe the cross-section profile. Don't try to do this with other shapes, because they will collapse as soon as you cut them, whereas half of a cylinder will still stand up.

When you view the cut cylinder there are several important things to look for. First of all, a primary objective in throwing is to keep the outside profile and inside profile as similar as possible. In other words, if the walls are of uniform thickness, then the outside and inside will be very close to the same contour, whereas if the lower wall is very thick, the outside and inside will be very different in shape. Start off with a series of six or eight small cylinders, working up to about 4" or 5" in height. Try to achieve walls that are no more than \( \frac{3}{8} \)" thick at the bottom and \( \frac{1}{4} \)" just below the rim, with a smoothly tapering wall in between. The bottom thickness is not so crucial, but remember that if you wish to trim the bottom it should be \( \frac{1}{8} \)" to \( \frac{1}{2} \)" or more thick (this will give you ample thickness for trimming a raised foot-ring), and make sure that the bottom is flat and level, with a distinct rounded corner where the bottom ends and the wall begins. Later you may wish to throw forms with a curved bottom, but for skill development it really helps to become familiar with flat-bottom cylinders.

When you cut each cylinder in half remember to carefully observe the uniformity of the walls, the smoothness and thickness of the bottom, and the uniformity and thickness of the rim. There should be very little variation in thickness of the walls from bottom to top, and the lower inside corner should be quite square, as indicated in Fig. 3.5g. With each successive cylinder, try to respond to the problems or faults in the previous ones, so that you are continuously experimenting and developing your technique.

If you find yourself frustrated with the ordinary cylinder, try doing timed cylinders. Sit down at the wheel with 20 or 30 small balls of clay, and have someone time you. This is a great exercise to do in a classroom situation. Start with five-minute cylinders, with 30 seconds in between to scrape off the previous one and put a new ball of clay on the wheel. When time is called, immediately stop the cylinder you are working on and scrape it off the wheel. After two or three of these, reduce the time to four minutes, then three, two, and finally one-minute cylinders. You will be amazed at the progress you can make through several of these sessions.

**What To Do with the Basic Cylinder**

When you are comfortable with the basic cylinder, you are ready to experiment with a variety of vessels. Most vertical forms like cups, mugs, pitchers, and vases start out as basic cylinders, whereas low, wide forms like bowls, casseroles, and baking dishes start out as a flared cylinder like an inverted cone (see section on throwing bowls before attempting this). As you proceed from the doughnut stage, anticipate what you are going to make, and accordingly either keep the cylinder narrow or flare it out. If you are making a mug, after the cylinder walls are thin enough you can simply finalize the shape with the wheel at medium speed, by pressing inward or outward with your fingers, a sponge, or a rib. At the same time, you might apply one or more decorative grooves by pressing the sharp end of your wooden knife (not too deep) or the handle end of your needle tool against the spinning pot.

More detailed explanations of various thrown forms appear later in this chapter. The following is an explanation of how to finish your forms.

**Remove All Water**

When the pot is finished be sure to
remove all water from the inside, and sponge off excess water and slurry from the surface of the pot. It is critical that you not leave any water in the bottom of the pot, because this will soak into the clay causing it to expand, and during drying the bottom will shrink more than the walls, causing S-cracks.

**Trim Excess Clay from the Base**

When you are sure the pot is finished but before cutting it off the wheel always trim off excess clay around the base. This is an important step, because if extra clay is trimmed away now it will be far easier to remove the pot from the wheel, plus you will decrease the amount of trimming to be done later when the pot is leather-hard. Also, many forms can be thrown in such a way that they require only minimal finishing without any additional trimming after they are removed with the wheel, and in this case it is especially important to pay close attention to the bottom thickness and to finishing the outside lower edge.

If there is only a modest flange of excess clay around the bottom, you can scrape it off with the square corner of your wooden rib or with a knife-edge modeling tool. If there is a more extensive flange of clay you can trim it off as a single piece, leaving a nice clean lower edge, as shown in **Fig. 3.6**. With the wheel at medium speed, use the sharp end of your wooden knife to slice into this excess clay so that it is cut away from the pot but remains in a continuous ring. Hold the wooden knife firmly with both hands, at an angle with the tip pointing in the direction of wheel rotation. Cut vertically, but at a slight angle pointing inward towards the center of the pot. Be sure not to cut inward at such an angle that the tool cuts too close to the inside surface. Cut until the tool touches the wheelhead. Using the tool as a guide, squeeze water so that it flows into this cut. When the cut is full of water, use the same tool to slice in under this ring of excess clay, directly against the wheelhead. When you have cut in far enough to intersect the first cut stop the wheel, slice vertically through the ring of excess clay, and remove it.

Whichever technique you use to remove excess clay, make sure you end up with a moderate inward bevel at the base of the pot. If necessary, simply use a wooden modeling tool or wooden knife to create such a continuous ring. Hold the wooden knife firmly with both hands, at an angle with the tip pointing in the direction of wheel rotation. Cut vertically, but at a slight angle pointing inward towards the center of the pot. Be sure not to cut inward at such an angle that the tool cuts too close to the inside surface. Cut until the tool touches the wheelhead. Using the tool as a guide, squeeze water so that it flows into this cut. When the cut is full of water, use the same tool to slice in under this ring of excess clay, directly against the wheelhead. When you have cut in far enough to intersect the first cut stop the wheel, slice vertically through the ring of excess clay, and remove it.

**Fig. 3.6 TRIMMING EXCESS CLAY**

![a. Trimming excess clay away from base of finished pot: Slice into the clay with a wooden knife.](image)

![b. Dribble water along the knife to feed it into the cut.](image)

![c. Slice horizontally under the waste flange with the wooden knife.](image)

![d. Stop the wheel, cut through the waste flange, and remove it from the pot.](image)
a bevel. This will make it far easier to remove the pot from the wheel.

Removing the Pot from the Wheel

When you are sure the pot is finished and properly trimmed and beveled at the base, you are ready to cut it off the wheel. Wipe all water and slurry away from the base of the pot. Stretch the cutoff wire between your hands, and wrap either end around your fingers to shorten the useable length so that it is 4” to 6” longer than the width of the pot base. With the wire held taught, press it down against the wheel with your fingers or thumbs, and pull it under the pot. With large-diameter pots, always cut them off with the wheel turning. This requires a little more control, but it will keep the cutoff wire from climbing up into the base of the pot.

If your wheel is equipped with removable bats, then after running the cutoff wire under the pot you can simply lift off the bat and set it aside. Plates, platters, and wide, low bowls or casseroles should always be thrown on bats, whether or not the wheel has bat pins. If you are throwing directly on the wheelhead or if you wish to reuse the same bat there are several possible ways to remove the pot. Most cylinder-based shapes can be lifted off the wheel by hand, as long as they are not too thin or too saturated with water. Be sure to trim off all excess clay, create a bevel undercutting the lower edge of the pot, and remove all water and slurry from the outside of the pot and from the wheelhead around the pot. Use an old towel to remove all water and slurry from your hands. Gently wrap your hands around the pot with as much surface contact as possible (Fig. 3.7). It is the friction and not the pressure that allows you to lift the pot without distorting it. Be sure to have a ware board handy, so that you only need to move the pot a minimal distance. Lift the pot and move it to the ware board in one sure continuous movement. Do not attempt to sponge off the hand marks until the pot has stiffened up a bit. As an alternative lifting method, if the pot has a very thick bottom for trimming a tall foot, you can apply pressure with your fingers and thumbs of both hands on either side of this thick base, lifting the pot upwards without touching the walls.

In some cases, even a wider pot can be lifted from the wheel if it has been thrown quickly and the clay still has some structural integrity. One option is to lay a sheet of newspaper or paper towel flat across the rim, very gently smoothing it to the rim. As you lift the pot, this will prevent the rim from distorting. Once the pot is on a ware board, the paper is easily peeled off, and the rim may be smoothed with a sponge.

Some potters seem to appreciate the commercially available pot-lifters, as it is possible to lift even awkward forms by forcing these two flat sheet metal tools under either side of a pot. The pot-lifters leave obvious marks on the underside of the pot and are therefore appropriate only if you plan to wheel-trim all your pots.

If a pot is too large or too thin to lift and has not been thrown on a bat, you may slide it off the wheel onto a ware board, although this is never a preferred method. Also, it only works on a wheel with no splash pan or with a removable splash pan. Remove part or all of the wheel splash pan in order to be able to hold the ware board next to the wheelhead. Generously wet the surface of the ware board where you are going to slide the pot onto it. Squeeze a generous amount of water around the base of the pot, and pull the cutoff wire under the pot several times to draw the water underneath. Holding the ware board next to and level with the wheelhead, wrap your hand gently around the pot and pull towards you, allowing the pot to rotate as you pull it. Continue to reposition your hand and rotate the pot as you slide it. If it doesn’t want to slide easily, apply more water and pull the cutoff wire under again.

LIFTING POT FROM WHEEL

Figure 3.7 Some freshly thrown pots can be lifted from the wheel with broadly placed gentle hand contact encompassing the base of the pot.
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To create spiral grooves from the center outward to the edge. Thoroughly sponge off all moisture, center a bat on the cookie, and carefully pound it in place. When you are done throwing a pot, use an old screwdriver to pry the bat loose. The spiral grooves admit air, allowing you to pry it loose easily. The same cookie will work for many subsequent bats, but you may occasionally have to rewet it and/or redo the spiral grooves.

Throwing on Canvas

As an alternative to using bats, consider throwing on canvas squares, as shown in Fig. 3.10 on page 56. Although rarely used, this is a very appropriate method with most small shapes and almost any cylinder-based shapes, especially those that will not require wheel trimming. Any heavyweight canvas cloth will work. Make sure that the diagonal measurement of the squares is at least twice the base diameter of the forms you wish to throw. Mix up a gritless slurry of appropriate clay (Goldart for stoneware, kaolin for porcelain or whiteware, Redart for terracotta). Using your rubber rib, smear both sides of all new canvas squares with a thin coat of slurry and allow them to dry completely. Smear a spiral of slurry onto the wheelhead with your fingertips. Place a dry, coated canvas square on top of the slurry, and squeegee out from the center with your rubber rib, rotating the wheel. Allow the slurry that comes out from under the canvas to smear across the top of the canvas, but thoroughly squeegee off all excess with the rib. Proceed with throwing in the conventional

ATTACHING BAT WITH PINS

Figure 3.8 Attaching a bat with wads of clay when using bat pins: Flatten the wads with the palm of your hand before placing the bat.
fashion. When the form is complete, carefully run your cutoff wire under the canvas, grasp one corner of the square, and pull the canvas and thrown form off onto a ware board. If this technique appeals to you, get a cheap triangular concrete-finishing trowel. Pull the canvas and vessel onto the trowel, and from the trowel onto a ware board. When the wares are leather-hard, peel off the canvas, smooth the small burr along the edge, and sign the bottom (if you wish).

**Critical Points in Throwing**
The following review is designed to help beginning clayworkers become familiar with the most important points in throwing. As mentioned earlier, there are lots of steps to keep track of, and it will help greatly to go over this list frequently and commit it to memory.

**Prepare Clay Properly.** Wedge the clay thoroughly before using. This is especially important for wheel-thrown work. Don’t waste time on clay that is too wet or too dry. If clay is too wet, let it sit out until stiffened adequately and rewedged, or wedge it on a dry plaster surface, or wedge in some dry material (although this decreases plasticity). Don’t try to reuse clay from a previous pot that didn’t work out—let it stiffen up and rewedged it before using again.

**Prepare Plenty of Clay.** With only one or two balls of clay in reserve, it is easy to develop an attitude of preciousness about each pot and a desperation to make each one work. Always prepare at least a dozen balls, and if a pot is not working, remove it immediately and start another one.

**Clean and Dampen the Wheelhead.** The ideal surface for receiving the clay is slightly damp but not wet. Use a rubber rib to squeegee off all remaining slurry from the previous pot, and if any surface moisture remains, remove it with an old towel.

**Slap Center.** Before applying water, slap center a ball of properly prepared clay on the wheelhead or bat, and seal down the edges thoroughly.

**Avoid Touching the Clay When the Wheel Isn’t Turning.** Except for slap centering, always start the wheel before applying pressure, and always remove pressure before stopping the wheel.

**Aggressive Commanding Approach.** Clay appreciates a vigorous commanding approach with an economy of motion. Be clear about the specific reason for whatever you do, and remember that with an aggressive, adventurous approach you’ll learn very quickly. Take risks.

**Concentration of Pressure Points.** All stages of manipulating the clay depend on concentration of pressure points. Concentrating force

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**ATTACHING WITH COOKIE**

*Figure 3.9 Throwing a cookie for attaching bats: The spiral pattern allows the bats to be easily pried up. This form is thrown like a plate, as shown in Fig. 3.13.*
on a small area of the clay will give much greater control than broad application of pressure over a large area. Centering primarily involves pressure with the base of the right hand. Lifting the walls involves pressure with slightly bent fingertips rather than the flats of the fingers or the hand. Once the clay has taken the form of a basic vessel you should never use the broad surface of your hand for any shaping task. If you want to smooth or flatten a broad area, use a rib.

**Centering: Full Body Control.**
Centering and wheel wedging depend on full body control. The work is not done by your arm muscles, but rather by the full force of your upper torso when you roll your hips forward on the chair or bench.

**Work on the Right-Hand Side of the Wheel.** After centering always work at the right-hand side of the wheel where the clay is moving away from your hands (assuming you are throwing counterclockwise).

**Work at the Correct Speed.**
Use full speed for centering, wheel wedging, and penetrating the lump of clay. Use medium speed for widening the bottom, lifting the walls, and finishing small vessels. Use slow speed for large vessels.

**Action→Reaction.** For every action there is a reaction. Keep in mind the consequences of every type of pressure that you apply to the clay, and when lifting or shaping a vessel apply corresponding pressure both inside and outside the form. Avoid expanding the diameter of a form without pressure from both sides, unless you are very sure of the anticipated outcome.