Power OF THE Drill

BY LEWIS PALEIAS

DRILLING COUNTER-CLOCKWISE. *Drilling must be accompanied by forward motion (Fig. B).*

Drilling jing **twists** as it penetrates and adds **power** to the torque.

Regardless of the many differences between the internal and external, or hard and soft martial arts, there are only three ways that force can be generated: linear, torque and as a wave. You can think of them as the hammer, the drill and the whip.

In physics, they all have individual mathematical equations to predict the amount of power produced. In reality, the forces can be mingled to illicit different outcomes. Linear force, familiar to all hard stylists, is based on using your large muscles (usually the shoulder and arm muscles) to propel the fist forward into the target. This math equation is easy: power equals mass x the square of the speed. It shows that the force can be increased by either increasing the mass (i.e., heavier fist or shifting/lunging the weight forward) or by increasing the speed (remember: it's power squared, so modest increases in velocity greatly affect power outcome). For comparison sake, we can assume that this kind of strike might produce around 100-to-150-foot pounds of power per square inch. Don't think that only external styles use linear force: xingyi's beng chuan (wood fist) is an elegant, direct way to end a fight.

The Twist

Most Asian martial arts also teach their practitioners to corkscrew or twist their punches as they hit (just think of the "reverse punch" in karate.). This "drilling jing" (power manifestation) twists as it penetrates, taking the first equation and adding the power of "torque." When your hand touches your opponent's body, your arm and hand rotate clockwise (Fig. A) or counterclockwise (Fig. B) in a screwing motion, which makes the power penetrate deeper than a linear attack.

This aggressive power, generated by the turning of the waist and shoulder, is usually directed forward, although it can also be used sideward. The corkscrewing motion increases the distance the arm travels, magnifying speed and mass, thus increasing "torque." This is exactly how increasing the torque on the drive shaft of your car increases the car's forward motion. Adding torque in martial application could quadruple the impact of the punch to as much as 400-foot-pounds per square inch.

Additional force can be generated in the internal arts, where

THE PHOENIX EYE FIST *(Fig. F).*

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ZUAN CHUAN (WATER FIST) APPLICATION *(Fig. C). Ted Mattingly and the author square off (1). The defender sidesteps to the left and parries the attack (2). While the defender steps through his attacker's door, his left hand twists him open. His right zuan then crushes the trachea (3).*

power begins with and is "rooted in the feet, generated in the legs, directed by the waist and expressed in the hands." As each part receives the energy and torque from the preceding joint it transmits that energy plus its own to the next segment. By the time it finally emits out the hands, the power has increased logarithmically. This power add-on from segment to segment (what Dr. John Painter calls "entrainment") multiplies the 400-foot-pounds by a factor of three, or as much as 1,200-foot-pounds per square inch. Just like the rifling in a gun barrel, the number of degrees of twist and the direction of the twist proposes an infinite combination of variables.

Compare xingyi's zuan chuan (water fist), where one hand twists forward 180 degrees from palm down to palm up while the other twists back palm up to palm down (Fig. C), with tai chi's "deflect downward, parry and punch" (Fig. D), where the right fist drills forward in a lazy 45-degree palm up to vertical fist as the left pulls your opponent into the blow. Compare them with the twisting drills of bagua's "hawk flies to heaven." Drilling jing also can be used to pull your arm out of your opponent's grasp. Here too, the shoulder and waist are the source of the power. Since the arm is shaped like an oval, you can deflect an oncoming fist away via centrifugal force by drilling away from your body.

Hand Forms

In drilling, the fist, finger, knuckle, palm and arm can be used for attack, frequently against vital cavities. The most common hand form, however, is the phoenix eye fist (Fig. F). Forming this weapon involves making a fist while leaving your index finger forward. Closing it last will leave the second knuckle jutting forward around one-half inch.

As all the power is directed through a small point it has great penetrating power, destroying nerves, blood vessels and internal organs. My teacher, Dr. Yang Jwing Ming, likens it to a dum-dum bullet; from a small entry point the destructive energy spreads throughout the body. Tensing the muscles a bit to direct the jing ensures that it penetrates and also protects the hand against injury. In tai chi chuan, the time you are tensed is kept as short as possible. Also, your yi must be concentrated inside your opponent's body in the organ or cavity being attacked.

Conditioning Methods

Because drilling jing is popular in both external and internal styles, many training methods have been developed. One of the most-common ways used in external styles is to drill your fist or knuckles into a basket of mung beans. (Mung beans are used because of their medicinal properties). Later, sand, pebbles and iron filings can replace beans. The easiest way to strengthen your fingers is by slow finger push-ups, first against the wall and then on the floor.

To strengthen the phoenix eye fist push the middle knuckle of the index finger against the wall while holding a phoenix eye fist. Do not push on the tip of the bent index finger or you will injure the joint. Pushing on the flat second bone of the phalanges strengthens both the bones and connective tissues. Massage dit da jow liniment both before and after training.

My favorite method (because I live on the beach) is "sand conditioning." Drill your knife hand (palm up to palm down) in loose sand (you could use a pail). Close your fist and withdraw your hand (twisting to palm up) while squeezing handfuls of sand. Now drill your arm forward (twisting palm up to palm down), rapidly extend your fingers and fling the sand away. This exercise strengthens the skin, bones, and grip while increasing speed.

Punching bags are also popular with drilling training. Start with your fist or knuckles lightly touching the bag. Suddenly generate the jing from your waist and shoulder and drill your hand forward to bounce the bag away. Once you get the motion, make the wind up shorter and shorter until there is no visible preparation for the punch. The goal is to have the body and fist move only a short distance. Always use dit da jow liniment both before and after all hand training, because: it increases the qi flow to the hand; it heals blood clots and bruises; and it strengthens the bones. Rub it on the whole arm, not just the hand. Though there are quite a few commercial bottles available, I find that nothing beats what you can make at home. I use a recipe I found in this magazine.

The Tai Chi Way

The training approach in tai chi is different because internal styles use less physical force. One method uses a thick layer of soft material, for example, paper napkins, on a table (Fig. H).

"The fist, finger, knuckle, palm and arm can be used against vital cavities."

DRILLING CLOCKWISE, *Ed Mendelsohn gets clocked (Fig. A).*

SPEED DRILLING A PIZZA BOX *(Fig. I).*

DRILLING NAPKINS EXERCISE *(Fig. H).*

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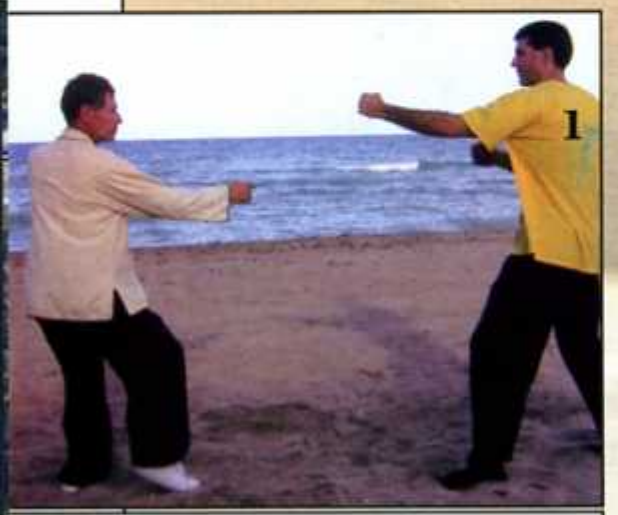
The fist is pushed down with a screwing motion. The muscles should be relaxed as the yi (concentrated mind) strives to extend the jing to the surface of the table. Increase the thickness of the material when you can bounce the jing off the table. The thicker the material, the greater the drilling power required. It is also important to do this exercise horizontally.

It is desirable to practice extending your qi by punching at a candle. When you can extinguish the flame without touching it, shorten the distance between your fist and target.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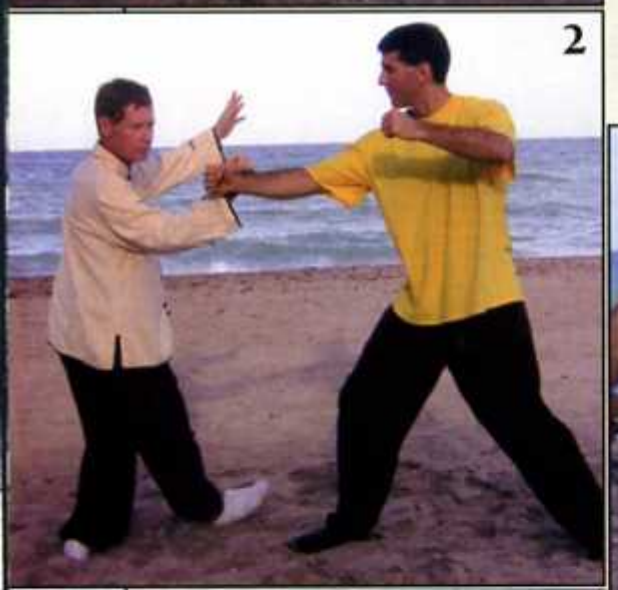
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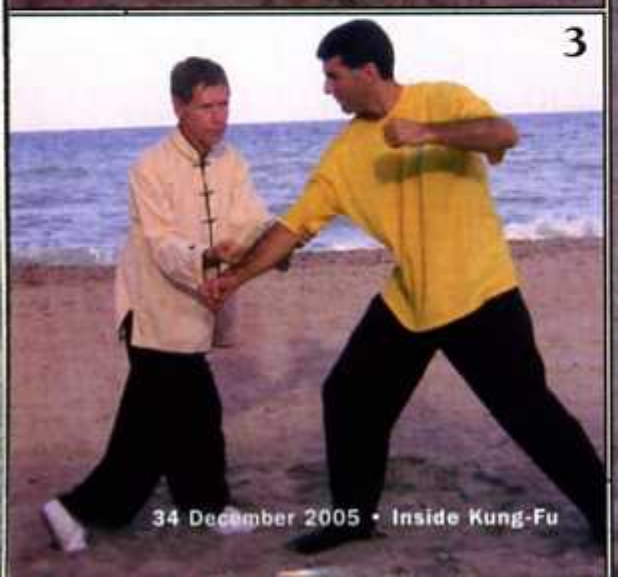
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Testing Your Drilling Jing

Suspend a one-half sheet of newspaper from one hand. From about six inches away, drill your other hand forward, piercing the center of the paper. Do this without withdrawing your hand. Once you have mastered this drill, move up to a single sheet of bond paper.

Lastly, you can progress to striking a suspended pizza box (eat the pizza first). When you can successfully penetrate this with your phoenix eye fist (Fig. I), shorten the distance between your fist and the target. The main trick for increasing your hand speed is to go from a relaxed state (sung) to exploding into your strike. When you strike, keep your hand form loose until just before the target and tighten your muscles just prior to impact. Your body weight will be driving just behind the fist. Remember: the longer you practice, the stronger your power, and the more natural and smooth your power generation will be.

There are No Secrets

Mastering drilling power is like mastering anything else — there is no magic, but there are specific recipes and principles that must be understood. Then comes the hard part: "kung-fu" (time and effort). When you can easily penetrate a pizza box you will have developed the ability to generate all the force needed to seriously injure an opponent. Don't get complacent; the "power of the wave," as well as the footwork, must still be perfected before you can get you through your opponent's empty door.

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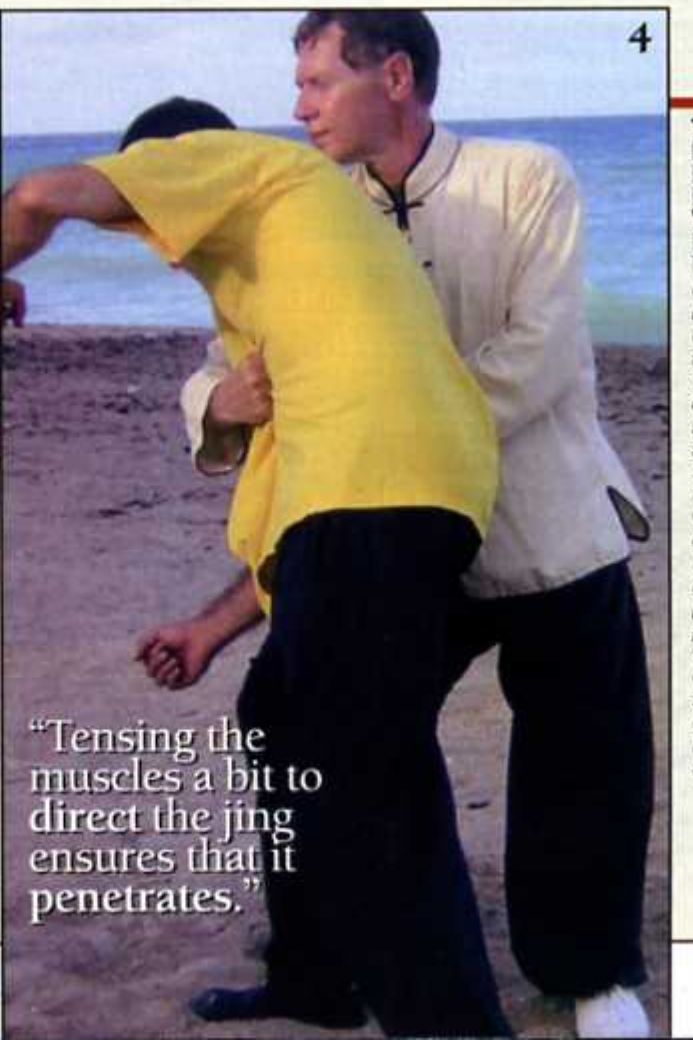
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"Tensing the muscles a bit to direct the jing ensures that it penetrates."

TWIST BODY, DEFLECT DOWNWARD, PARRY & PUNCH *(Fig. D). Ken Blue and the author square off (1). The defender sidesteps and smashes TB 5, breaking the attacker's wrist (2). The defender twists his body and plucks HT 3, pulling downward (3). He continues stepping and drills LV 13, rupturing the spleen (4).*