

ROWING AND SCULLING

Good rowing (or sculling) is fast rowing, fast relative to the energy applied. Put another way, good rowing is efficient.

It is an undisputed fact that the mastering of perfect technique is a decisive factor in performance. The frequently cited maxim, "endurance gains boat lengths, technique only gains metres" has cost many crews their victory- in the end, metres count! Dr. Ernst Herberger et al. - "Rudern - the GDR Text of Oarsmanship"

In the simplest terms, rowing involves only two components, propulsion and resistance. The first must be maximized; the second minimized. The many implications of this maxi- and mini-mization reside under the umbrella of "technique". Proper technique applies the laws of physics and the elements of human physiology toward moving a boat efficiently, and in no way expresses a "style" or arbitrary set of movements. Efficiency demands elimination of movement or work not dedicated to moving the boat forward.

Propulsion derives primarily from force against the pin (oarlock), though a minor effect results from the crew pulling the boat under them as they move toward the stern during the recovery. Interestingly, the two forces combine to produce the boat's maximum speed after the blades leave the water.

Propulsion and resistance in the real world of the racing shell result from three interacting elements, namely pulling, blade work, and the waterline of the boat. This division of elements does not in any way imply a sequence of separate gestures during the stroke. In fact, correct technique melds all facets of propulsion and resistance into one continuous movement, described by George Pocock as "one cut". So important is this sense of seamless movement that much of the description to follow focuses on feel, what the body senses and responds to throughout the stroke. This is one activity in which "the blind (coach) leading the blind (rower)" can produce superior results, as each must express and understand feel and not rely on schematic descriptions.

THE STROKE

SIT READY-

Before initiating the first stroke, and every subsequent stroke, the rower will prepare for a combination of hard work and graceful movement.

- 1.) The back is elongated, with the tailbone lifted (pelvis tilted forward), the upper back and shoulders relaxed. This stacking of the lower vertebrae, "setting the back", is universally performed by weight lifters prior to a heavy lift. The rower/sculler, however, must add a forward lean, with hands reaching well beyond the feet, making correct back preparation essential to avoiding injury and maximizing leverage.
- 2.) Whether rowing or sculling, the body sits and moves symmetrically, the shoulders remaining essentially square to the hull at all times.

- 3.) The sliding seat is drawn sternward to about "3/4 slide", the actual position affected by the angle of the lower back to the water. Knees are comfortably spread to avoid restriction of reach or setting the lower back. The arms extend on either side of the lockside knee when sweep rowing. The chin aims at the horizon, slightly lifted.
- 4.) The hands rest lightly on the oar handles, containing the handles with the fingers formed into a relaxed hook. Scull handles are held with the first finger resting on the rounded end, thumb lightly touching the lower side of this rounded end. To test his hold, the sculler can simply extend his arm, utterly relaxed, then gently lower the hand onto the very end of the scull handle without involving any muscles or changing finger position. The handles sit neither in the palm nor fingertips, but between the first and second joints of the fingers. **THIS RELAXED HOLD IS KEY TO EFFICIENT BLADE WORK.**

The sweep oar is held with the outside hand close to the end of the handle, the lockside hand a shoulders width or less away. Due to the larger handle diameter, the lockside wrist may have to drop slightly to assist the fingers with the squaring action.

FEEL-

The positions described above, which occur for a brief moment prior to every catch (but with the seat drawn to "full slide"), offer a feeling of a low center-of-gravity, an open chest and air passages, a slight tension in the lower back muscles, even side-to-side pressure on the seat, an absence of squeezing in the hands and forearms, shoulders hanging in response to gravity. For the most part the rower/sculler will be unaware of body parts because they are so relaxed. The exception, setting of the back and overall extension, produces a muscle tension akin to a dissonant musical note that needs to resolve to a "comfortable" scale tone. This resolution occurs with the beginning of the stroke.

CATCH-

The rower attempts to make the catch indistinguishable from the drive. He simply starts pulling, moving the boat from his maximum effective reach position.

To our thinking, the "entry" or "catch" is very definitely a part of the drive and to separate the two can lead to much trouble. Stan Pocock

Of course, the blade must enter the water and rotate to its squared position determined by the oarlock. Yet the catch is only complete when the shaft of the oar is bent, with full pressure against the oarlock pin. This bending of the shaft can never occur too quickly.

A correctly performed catch will:

- 1.) Result in instantaneous pressure against the pin, felt as pressure against the fingers.
- 2.) Not disturb the attitude or flow of the hull.
- 3.) Minimize stern check.* (see below)
- 4.) Use as few gestures as possible.
- 5.) Set the blade at correct depth and angle.

The blade is driven into the water by springing from the stretcher. The legs have the strength to take up the initial load of the stroke and the power to provide speed necessary for the blade to grip. Mike Spracklen - Canadian National Team Coach

This is accomplished by:

- 1.) Preparing the blade by rolling up to approximately 60° off the horizontal and lightly touching the lower edge of the blade on the water. The roll-up results from lightly curling the fingers as if making a fist, drawing the handle across the thumb. Note particularly that the roll-up is NOT performed by rotating the wrists.
- 2.) Very quickly driving the legs. This leg drive initiates the catch. The preparation described in item 1.) occurs independently of the actual catch. The lower back does not yield during this initial "leap", so the hands move bowward the same distance as the seat. In simple terms, **drive the blade into the water** with the legs. Do not place the blade in and then drive the legs.
- 3.) **THE KEY**-Simultaneous with the leg drive, but in response to the pressure of the drive, the fingers curl into a fist shape, assisting the rotation of the handle. The handle rotates as the water grabs the lower edge of the blade. The blade will dive slightly to correct depth, just covered. The result is the quickest possible engagement of blade against water.

An equally effective method, particularly useful in rougher water, is practiced by Frank Cunningham. A moment before the drive, lift the 2nd and 3rd fingers slightly, then tap the handles around with the tips of these fingers. With precise timing and a loose hold, this gesture accomplishes the same immediate engagement and coordination with the leg drive.

FEEL-

The oarsman seeks the feeling of the earliest possible pressure against his fingers, avoiding even the slightest delay. Feel the immediate load associated with a first stroke taken with blades squared and buried. Listen for the elimination of splash; feel no impact.

He feels: His index finger contacting the round end of the handles, similar to a ball-and-socket joint.
A quick, light closing of the fingers as the handles rotate.
His legs "leaping" off the foot stretchers, feet pressing evenly, pushing the seat bowward.
A brief moment of the arms pulling at the shoulder joint sockets.
The first, second and third fingers sharing the load of the drive.

Comfortable tension in his lower back, relaxation in the upper back.
An engagement of the %ats+, but very little actual movement of his shoulders, arms, and back.

Overall, he feels that he has instantly changed from rest to pulling, with almost no body or hand movements in between. The catch has %disappeared+.

Length is utilized at the beginning by bringing the blade down close to the surface before entry. A blade that is too high off the water has further to travel and grip will be delayed. Mike Spracklen

DEVIATION-

A sweep oar, and both sweeps and sculls in rough water, requires some modification of this "sculler's catch".

- 1.) The larger diameter of the sweep handle may require some raising of the lock-side wrist during the preparation phase.
- 2.) For safety, the fingers of the outside hand (left hand for a port rower) should not protrude past the end of the sweep handle.
- 3.) The rower will sense a slightly greater lift of the handle than the sculler.
- 4.) The sweep handle turns in, is not turned by, the outside hand. The lockside hand performs the sculler-like gestures described above.
- 5.) Rough water may prohibit, or make erratic, the touch-down of the lower side of the blade prior to leg drive. This may affect the amount of roll-up and the degree to which the water can rotate the blade.

Despite these accommodations, the goal remains the same: an instantaneous bending of the shaft while at full reach, clean blade entry with correct depth, minimal movement of body and hands.

One of the most apparent, and aesthetically pleasing, features of a well-rowed team boat is precise timing, all blades entering and leaving the water at the exact moment. Sloppy timing invariably produces hull instability and ineffective application of power. But even precise blade timing will not produce speed unless accompanied by equally precise and efficient application of power. This particularly implies the catch technique described above, the early "pop" of leg power.

***Notes on stern check:** Stern check, usually seen as a halt in the run of the boat at the moment of catch, is to some degree unavoidable. Check occurs when the legs push sternward against the foot stretchers. If the blades are not in the water at this precise moment, check can be very pronounced, momentarily bringing the boat to a complete stop. Even if the blades are fully engaged in the water, the flexibility of the oar shaft and the slippage of the blade through the water will result in a small amount of check, despite an *apparent* smooth acceleration of the hull. A deliberate placement of the blade in the water, followed by a gradual increase in power, may mask, but does not reduce this unavoidable amount of check.

As the legs drive the blade into the water, they are, for a moment, pushing against the run of the boat before the blades grip. This checks the boat's movement forward. There is also some loss of power when the legs drive before the blade grips. These losses are unavoidable, but can be reduced by covering the blade quickly. Mike Spracklen

Drive-

The drive phase, incorporating the catch in its first moment, appears as a sequential uncoiling of the body and drawing in of the handle(s). This sequence of motions belies the fact that the arms, back and legs are working together. The relative strength of the various muscle groups, not a purposeful delay of movements, produces the sequential motion. The arms, for example, just cannot overcome vigorously driven leg muscles early in the stroke.

A correctly performed drive will:

- 1.) Produce maximum pressure against the oarlock pin over the greatest effective arc.
- 2.) Maintain a correct and consistent oarlock height above the water, i.e. eliminate rolling of the hull.
- 3.) Minimize energy and speed lost to pitching and bouncing of the hull (vertical motion).

This is accomplished by:

- 1.) Explosively driving the legs against a well-braced connection to the water. This quickness and force (leaping) will result in the seat traveling about half its slide length before the strongly pulling back, shoulders and arms show much movement.
- 2.) Moving sinuously with the back to maintain a constant level of the head and shoulders. As noted in Item #1, the back does not swing open early in the stroke, avoiding undesirable lifting of the head and shoulders.
- 3.) Adjusting the hand height as necessary to maintain a constant oarlock height. The rower must further insure that his blade stays fully buried until he pushes the handle out of bow.
- 4.) Keeping the body square to the boat, allowing the arms, not the torso, to compensate for the arc generated by the handle.
- 5.) Maintaining pressure against the oarlock until forced by the body to initiate the release.

FEEL-

A good drive is signaled by an early sense of the buttocks lifting off the seat. This lightness carries through almost to the point of release. The feeling of weight returning onto the seat will cue the transition from drive to recovery. This lifting-off-the-seat is subtle, far short of actually leaving the seat.

Lift of the athlete weight from the seat correlates very closely with the force application at the handle. Therefore, try to hang longer on the handle during the drive and sit down on the seat as late as possible. Valery Kleshnev - Australian Institute of Sport

The rower will feel that he is maintaining an even level of the head and shoulders, moving fluidly and serpent-like as the back angle opens.

The back will feel strong and unyielding. With a properly "set" back, even the strongest leg drive will not produce a feeling of strain in the lumbar region. Improper preparation of the lower back will likely produce a pulling or straining sensation across the upper back, as well as the lumbar area.

The fingers will feel as if they are pulling against the stern side of the handle(s), with a light enough hold to sense whether the oar sleeve is well seated in the oarlock. The hold should feel comfortably firm, but only containing the handle, not gripping it strongly.

The pulling pressure against the fingers will feel constant through the drive until the instant of release.

The aim of the oarsman (or sculler): Move the boat through the drive as quickly as possible, maintain the fullest reasonable reach and squeeze-through, use the body to enhance the speed of the boat, do nothing to slow it down, avoid unnecessary stressing of any part of the body. Period. Stan Pocock

Release/Finish

As implied earlier in reference to "one cut", the stroke has not finished at the end of the drive. It starts and stops in the same place, the instant before the catch. A good finish exhibits no clear division between drive and recovery, due to the overlap of movements.

A correctly performed release will:

- 1.) Maintain maximum pressure against the oarlock pin as long as possible.
- 2.) Minimize both the pitching of the hull and the time the hull spends with the bow pressed into the water due to forward weight transfer during the drive.
- 3.) Eliminate any feeling of resistance against the back of the blade as it leaves the water.
- 4.) Quickly return the rower to a relaxed, ready position.

This is accomplished by:

- 1.) Preparing for, even initiating, the release as the handle approaches the knees. (Note how early in the drive the rower anticipates the release!) The arms and shoulders continue the work of the legs to complete the draw as the legs reach full extension.
- 2.) Beginning a sternward movement of the body while continuing to pull the handle(s) bowward. The back having passed bowward through the perpendicular, the shoulders continue to press the handle home while the rower changes direction, pivoting on taut buttocks, legs pressing hard against the foot stretchers. The initial change of direction is seen as the rower slightly extending his chin sternward, though much of this appearance results from the shoulders continuing their work toward the bow and the back assuming a C-shape (stomach pulling away from the handle).
- 3.) Allowing the blade to assume a slight negative (partial feather) angle, so that it maintains its grip on the water, keeping the shaft bent. The blade attains an angle matching its direction out of the water.
- 4.) Using the bent oar to carry the body back through the perpendicular, regaining balance and swinging quickly to the catch angle before relaxing the buttocks and legs. This movement has started the blade bowward, clear of the puddles, after which the rower allows the oar to settle in the lock on the feather.
- 5.) Sliding rapidly to within three or four inches of the point of the tracks where the rower will make his catch, and then slowing until the seat has nearly stopped.

FEEL-

The feeling of the release is perhaps best approached by describing what the rower should not feel. He should avoid any sense of completion at the end of the drive. He should avoid feeling his blade leaving the water and/or feathering near the end of the drive. He should avoid slumping or lying back. He should hear no clunking of the oar in the oarlock, nor splashing at the blade. He should not feel a jerk associated with "fast hands away", sometimes an artifact of a late attempt to create a strong finish.

Only a small puddle should be visible at the point of extraction. Dr. Ernst Herberger

The rower should experience a sense of stroke length accompanied by a sense of urgency in returning his body toward the stern, feeling that he is doing everything he can to shift his weight sternward without releasing pressure against the oarlock. He should feel the legs, back and arms all finishing the drive at the same time. With a still-bent oar, the hands will feel as if they bounce away from the body with no hesitation. He should feel a subtle shift of balance begin when the handle draws to within 10" of his body, well in advance of the blade leaving the water.

The rower feels a "follow-through" after the release, an uninterrupted gesture. As in other sports, follow-through is smooth, active, and seen as the culmination of the pitch, golf

swing, swimming stroke, or rowing drive. The culmination occurs long after the ball has left the hand or the club has struck the golf ball.

The acid test for the proper finish, release and recovery is whether or not the feet stay planted on the stretcher throughout. To row as though the feet are not fastened in should be the aim. Stan Pocock

Rhythm

Frank Cunningham

Because it is common to so many activities, most people bring a good sense of rhythm to their rowing. However, rowing has its own rhythm, the exact shape of which has as much to do with the speed of the boat as it has to do with the effectiveness and the well-being of the rower.

First there is the ratio between the time the blade is in the water and the time it is in the air. For any given stroke rate, the time devoted to the recovery should stretch as long as possible.

Second, there is the variation in slide speed during the recovery. To maintain boat speed when the blade completes its arc, the rower must return his weight to the balance point of the boat (approximately half-slide) as quickly as possible, restoring the hull to its designed waterline. Put another way, the rower should let the boat slide under him as quickly as possible. However, to avoid a ballistic effect upon the boat, the rower must slow this approach to the catch in just the way a pendulum approaches the top of its swing.

If you reflect that the blades are in the water for less than half the time taken for the complete stroke cycle, which means that the boat has got to keep on running, without propulsion, the truth of the old cry that 'races are won between the strokes' is very apparent. Richard Burnell—“The Complete Sculler”

So, the recovery is at first rapid and then slow, whatever the stroke rate, like a bird swooping to a landing, then flaring to a stall.

Note that all of these movements are smooth, flowing, rhythmic. They must blend. Remember you are dealing with natural elements; water, waves and wind. They have a rhythm and so must the sculler. He must have his mind on this rhythm to get in tune with his art. George Pocock