

IMPRESSIONS OF A COACH VAN WINKLE

By Dan Thompson

You may not have heard of me. I was the masters champion whose marbles were questioned in 1990 when I abandoned a medical career for the nobler calling of coaching. As head age-group coach at Texas Aquatics, I had the great fortune of mixing with world-class talent and walking the same deck as Shubert, Reese, Kubic, Sterkel, and Roach. My research interests were front-end mechanics and propulsive plyometrics—subjects I spoke on at the '94 World Clinic.

Pushed back to doctoring in 1998, I had the worst time readjusting. Reaching for the stethoscope, it was always the stop watch my fingers were begging for! So ingrained was the coach persona—that to re-establish my white-coat identity I had to expunge swimming from my brain chemistry and switch over to cycling.

But after semi-retiring last year to Sewanee, TN—mountaintop perch of the University of the South—coach Obermiller offered for me to help out with his Sewanee Tigers. And zooks! My eyes popped open again to the laser light of swimming—and I set myself to catching up on the cogitations that had gone on during my long hibernation.

Looking back over a nearly nine year hiatus, I was struck by the turnabouts. Boomer and Salo once served as the radical rallying cries for us coaching renegades. But now they were nearly sainted, and a new antagonist had entered the scene—in the form of Dr. Rushall. This turn of events, I thought, spoke very well for our great sport of swimming. As each new paradigm triumphs, it is only right that another brave gadfly emerge to challenge it¹

Rushall's style can seem pedantic, but his stances are backed biomechanically, and he ought to be taken very seriously. He admits the importance of freestyle streamline, yet criticizes Boomer's catch-up, slide and glide mechanics—as exemplified by Vendt and Jensen and as contrasted to the Aussie style of Perkins, Hackett, and Thorpe. He points to underwater video of these and other great champions—not available in my prior coaching—that inarguably shows the absence of catch up in their competition mechanics. One might argue that Thorpe's style is a semi-catch-up, lying somewhere between that of Hackett and Jensen, but looking at sprint video of Popov, de Bruijn, and den Hoogenbond, Rushall's point is especially well taken. He contends that to coach these champions toward a catch-up style would in fact be to slow them, not quicken them. And he rejects the idea that the benefits of delayed shoulder re-roll can offset the "inertial lag" of delayed propulsion.

[To clarify: In the catch-up style (Fig. 1) the propelling surface (forearm and hand) is held horizontal after entry and begins to "reposition" toward vertical only after the recovering arm advances into the front quadrant.]

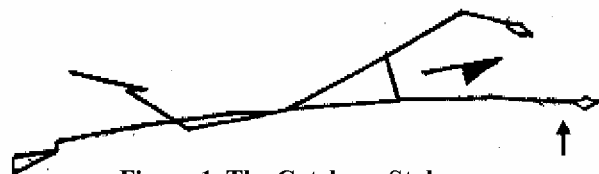


Figure 1. The Catch-up Style

¹ As I wrote in an unpublished 1996 article, "When will swimming realize that it needs those of us with the most uncomfortable angularities? We are its best antidote to ossified thought. In the words of Alexander Solzhenitsyn: 'In the West, fashionable trends of thought are carefully separated from those that are not fashionable. Nothing is forbidden, but the need to match mass standards frequently prevents independently-minded people from giving their contribution to public life.' [The Exhausted West, Harvard Magazine, July-August, 1978.]"

Thus, I am forced to reformulate ***the big question*** of the '90s: if not by catch-up mechanics, what in fact did account for Popov's sprint stride advance over the already sizable stride length of Biondi? What was the great lesson Popov was teaching us?

I once observed Popov warming up at close range. Clearly he used a catch-up style, and his long, languid stroke was mesmerizing. When he sprinted, he appeared merely to employ the same mechanics at faster tempo. His great frontward extension may have given the illusion of slide and glide, but Rushall's video shows plainly that he had abandoned catch up timing in the interest of speed. Yet obviously his stroke had not lost its magic. His stroke-rate efficiency over Biondi's was stark evidence of something special in his sprint mechanics.

In fact, what Popov had accomplished, I believe, was to preserve front-quadrant swimming at speed by retaining three critical components of his catch-up stroke: 1) full extension at entry before setting his catch; 2) advanced catch mechanics characterized by a high, fixed elbow—a maneuver later perfected so well in the strokes of Hackett and Thorpe that I am compelled to call it the "Aussie catch"²; and 3) great strength in his power-phase mechanics.

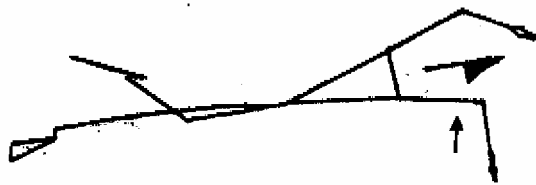


Figure 2. The Aussie Catch

All three of these elements, especially the Aussie catch, evolved in Popov in response to the relaxed distance-per-stroke swimming that coach Touretski believed to be the kinesthetic foundation for speed. Later, when Popov began pace training, inexorably he relinquished his catch-up style but retained his extension, Aussie

catch, and adductive power. *His recovering arm, rather than catching up to an extended hand as before, was instead catching up to an extended, fixed elbow, which remained nearly horizontal (Fig. 2).* So you see, Popov's sprint stroke retained its catch-up effect! His Froude number suffered, but the weight of his flexed forearm stayed well in the front quadrant where it continued to influence his center of flotation.

I try to imagine Popov's mechanics in the 50 M as he squeezed every bit of speed out of the stingy stroke counts dictated by Touretski. At some point, say at a slow count of 24, Popov maximized entry extension. Then, as the stroke count inched incrementally upward, he maximized the Aussie catch, which in turn—as the count inched further upward—helped him to maximize the strength of his power phase.³

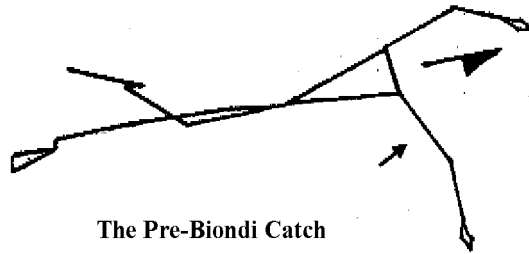
I am convinced that the Aussie catch, as now exemplified by den Hoogenbond—or at least as close as one can come to it based on flexibility limitations—is the maximally efficient catch for sprinters as well as middle distance swimmers. Because the forearm pivots toward vertical on a fixed elbow—the latissimus, the powerful muscle that pulls (adducts) the upper arm, is hardly engaged. Rather, the catch is performed largely with

² The Aussie catch was already evolving formidably in Biondi. Under Touretski's eye, Popov used stroke-length training to develop it further. Later, Den Hoogenbond and de Bruijn advanced it yet another notch by matching in the sprints its earlier full development by Hackett and Thorpe in the distance events.

³ When viewed underwater compared to den Hoogenbond and even to Hall, the huge drag pocket he creates is obvious. The bubbles coming off his hands are not the result of slippage, as we once thought; they are the product of great force application on the water, yet another benefit that comes of training at restricted stroke counts.

the muscles of the shoulder girdle and rotator cuff (those that move the scapula and rotate the arm), which minimizes upper arm participation in the “initial downsweep of the stroke.” The downsweep is thus performed mainly with the forearm and hand, leaving the upper arm extended and preserving its adduction for full use later in the power phase.⁴

This delay in upper arm adduction gives the Aussie catch a “patient,” slow-motion effect, as plyometric tension is stored in the muscles of the shoulder girdle (what I call “the plyometric pause”). The recovering arm therefore has no choice but to “catch up” to the working arm. The pre-Biondi catch style, conversely, sacrifices a slice of the upper arm adductive range, which shortens the latissimus before the power phase commences, producing a less forceful contraction and shorter power-phase stride length (Fig. 3).



The Pre-Biondi Catch

Of course, the high-elbow catch could be seen in competitive waters before the emergence of Biondi (e.g., in the Babashoffs and Skinner), but it was part of an “impatient” high-tempo stroke. Biondi added patience to the mixture by way of fuller extension at entry, fuller shoulder rotation, and a six-beat kick.

But back to the great Alexandre who—I remind you—still holds history’s fastest 50 M freestyle. Having maximized entry extension, Aussie catch mechanics, and adductive power (in addition, of course, to beautiful balance and rhythm), he had finally maximized his distance per stroke. Then, as Touretski continued to add strokes (insisting that maximal speed be squeezed from each count before adding another), Popov’s catch up and stroke length diminished until he reached competition speed at his 50 M sweet spot of 34 strokes. This represented the “optimum” compromise between length and rate because adding strokes beyond this number only brought the speed curve downward. I am betting that if you viewed this phenomenon underwater, you would see the post-34 stroke inefficiency manifested as an erosion of Popov’s extension, Aussie catch, and adductive power—as he strained impatiently for greater tempo.

I believe the great lesson Popov taught us is this: there is an effort continuum between the relaxed catch-up stroke and the competition non-catch up stroke. Catch-up timing diminishes incrementally as tempo quickens, but the Aussie catch prevents stroke regression by preserving front-quadrant mechanics. Shifting up and down along this catch-up continuum is the biomechanical basis of stroke gearing, as swimmers learn to adjust the degree of catch up depending on the prescribed intensity of the repeat.⁵

⁴ As described by Maglischo in *Swimming Fastest* (2003), page 96, the purpose of the initial downsweep “is to move the arm deep enough ... so that the undersides of the *upper arm* [italics mine] and forearm and the palm of the hand can be placed in a backward facing position where they can apply propulsive force effectively.” Yet Maglischo was apparently having second thoughts, writing later on page 105: “The upper arm should not be pressed down any more than is necessary during the downsweep. *Ideally, it should remain parallel with the surface ...*”[italics mine].

⁵ For discussions of stroke gearing, see Terry Laughlin’s cogent talk at the ’04 World Clinic or my article in the 2nd issue of *American Swimming*, 1996.

So there you have it! What so astonished us about Popov as he strode ahead of Biondi in Barcelona was the result of his ability to out-Biondi the master himself. Viewing this feat as a product of front-end extension, honed catch mechanics, and enhanced adductive power—developed through assiduous stroke-length swimming—would seem to reconcile the insights of Boomer and Rushall, who may be simply looking at opposite sides of the same equation. On the developmental side is Boomer, who may be forcing formative mechanics to do service at fast tempo. On the opposite side is Rushall, submerged at the Olympic finals, documenting the culmination of a propulsive process that began at developmental tempo.

I was mildly shocked to read an admonition by coach Rollason in a recent ASCA newsletter: "Never, ever, use catch up timing. Always hands opposite timing for sprinting, *including in all training* [italics mine]." I assume this includes aerobic sets, which I just can't believe to be right. Perhaps it is Rushall taken too far, just as Jensen may be Boomer taken too far. Always, the human tendency is to stretch a good thing too thin. One test would be for Hackett and Jensen to trade styles, but best of luck setting up that one!