Is Short Course Yards USA Swimming's Achilles heel?

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As a first year coach I remember sitting in the stands listening to Don Gambril and Ron Ballatore jibe each other about their respective incoming recruits. As it happened, about that time one of coach Gambril's prized recruits began to fail miserably in his 200 meter freestyle event. Ron's comments showed mirthful concern as to the "dog" Don had just recruited onto his team, whereas Don astutely pointed out that a 200 "yd" race ended right about the point at which the athlete began to fail. This brings on these two major questions.

- Are some athletes only suited for Short Course competition, or as coaches are we missing the boat with regards to development for Long Course competition?
- Is our success in the short course pool inhibiting our ability to explore the level of training and endurance needed to be successful in the long course pool?

Coaches have known for a long time that there is a significant difference between LCM and SCY. Even though we tend to think of 200 yards & 200 meters as being the "same event", we all know that turns make a huge difference in the required energy metabolism and the strategy employed by athletes. Although I have divided the potential problem areas into two separate issues/causes, they are for the most part, hard to tell apart and one might argue that one propagates the other. Regardless, the bottom line is the fact that there are far too many NCAA swimmers that aren't producing in a long course pool. Whether that's lack of desire, lack of training, lack of motivation on the part of the coach, or lack of ability, most importantly it reduces our depth at a time when we need to increase not decrease the pool of athletes competing for a spot on our Olympic Teams.

There is no doubt that the event duration is different, and as the following table (Table 1) shows it would be a real stretch to consider some events as being a similar event. By breaking the events down to the actual swimming duration, a coach now has a much clearer picture of what that difference really is. We knew that athletes spent a lot of time underwater in backstroke, but we can now see that they spend only twenty more seconds swimming than they do kicking underwater (men 200 36.13 sec's to 56.51 sec's). It would follow that the conditioning protocols that would be successful for a 200 yd backstroke would or should be very different from those to prepare a 200 meter backstroker (15.35 sec's to 99.34 sec's). Even in some of the 100's, the events actual swim duration shows far more disparity than I think most people would expect. For example the Men's 100 back time difference is 23.39 sec's (20.11 sec's in SCY to 43.51 sec's in LCM)

The statistics in the following table were derived from these sources:

- SCY – Top 8 performers at the 2002 Men's & Women's NCAA's
- SCM – Top 8 performers at the 2002 Short Course Worlds in Moscow
- LCM – Top 8 performers at the 2001 World Championships in Fukuoka

We broke the swims into three categories:

1. Total underwater time (taken from that point where the feet come into contact with the wall, to the moment when the head breaks the surface)

2. Total turn time (taken from the moment when the swimmer initiates the turn, to the point where the feet come into contact with the wall)
3. Total swim time (taken from the moment when the head breaks the surface, to the point where the turn is initiated)

TABLE 1
All numbers are averages from the 8 finalists in each event

WOMEN					MEN				
AVERAGES		total under water time	total turn time	actual swim time	AVERAGES		total under water time	total turn time	actual swim time
50 FR	SCY	4.83	0.95	16.21	50 FR	SCY	4.33	1.02	14.27
	SCM	5.00	0.87	18.81		SCM	4.78	0.92	15.92
	LCM	3.01	0.00	22.09		LCM	2.66	0.00	19.64
	DIFF SCY/LCM	-1.82	-0.95	5.88		DIFF SCY/LCM	-1.67		5.37
100 FR	SCY	9.13	3.49	35.39	100 FR	SCY	7.87	3.16	31.99
	SCM	8.86	3.46	41.25		SCM	8.71	3.39	38.56
	LCM	4.91	1.14	49.24		LCM	4.94	1.15	45.84
	DIFF SCY/LCM	-4.22	-2.36	13.84		DIFF SCY/LCM	-2.93	-2.02	13.85
200 FR	SCY	16.40	8.69	81.15	200 FR	SCY	16.50	8.47	70.81
	SCM	17.90	8.55	90.10		SCM	16.93	8.06	81.18
	LCM	8.95	3.59	106.60		LCM	8.35	3.66	96.06
	DIFF SCY/LCM	-7.45	-5.10	25.45		DIFF SCY/LCM	-8.15	-4.81	25.24
100 BK	SCY	18.45	3.73	31.32	100 BK	SCY	22.71	3.71	20.11
	SCM	15.82	3.93	40.04		SCM	22.45	3.87	26.10
	LCM	9.19	1.16	51.39		LCM	10.49	1.14	43.51
	DIFF SCY/LCM	-9.26	-2.57	20.08		DIFF SCY/LCM	-12.22	-2.56	23.39
200 BK	SCY	31.64	9.59	73.60	200 BK	SCY	36.13	10.06	56.51
	SCM	28.01	9.90	90.20		SCM	30.53	9.92	73.44
	LCM	12.71	4.17	114.84		LCM	15.35	4.18	99.34
	DIFF SCY/LCM	-18.92	-5.42	41.24		DIFF SCY/LCM	-20.78	-5.88	42.83
100 BR	SCY	17.32	2.63	40.58	100 BR	SCY	15.85	2.66	34.84
	SCM	16.48	2.45	47.83		SCM	16.92	2.53	39.86
	LCM	8.69	0.98	59.08		LCM	8.94	1.00	51.52
	DIFF SCY/LCM	-8.63	-1.64	18.50		DIFF SCY/LCM	-6.91	-1.66	16.67
200 BR	SCY	35.46	6.84	87.25	200 BR	SCY	34.69	6.73	74.17
	SCM	34.29	6.46	101.99		SCM	35.61	6.22	86.60
	LCM	16.87	3.29	125.74		LCM	16.74	3.26	111.51
	DIFF SCY/LCM	-18.59	-3.55	38.49		DIFF SCY/LCM	-17.95	-3.48	37.33
100 FL	SCY	18.04	2.65	31.14	100FL	SCY	18.00	2.64	26.11
	SCM	12.45	2.63	43.29		SCM	15.09	2.82	33.63
	LCM	7.34	1.04	50.87		LCM	8.24	0.88	43.48
	DIFF SCY/LCM	-10.70	-1.61	19.74		DIFF SCY/LCM	-9.76	-1.75	17.37
200 FL	SCY	25.96	7.03	83.51	200 FL	SCY	26.31	6.79	70.63
	SCM	21.71	6.63	100.73		SCM	26.18	6.09	82.93
	LCM	12.89	3.15	112.87		LCM	12.37	3.16	100.68
	DIFF SCY/LCM	-13.07	-3.88	29.35		DIFF SCY/LCM	-13.95	-3.63	30.05

To reinforce the fact that many athletes who compete in the NCAA finals fail to make a significant impact in the results of the summer Nationals, I've provided a look at how those athletes that qualified for the Top 16 in the NCAA's performed at the Summer National Championships & multi event qualifier in 2002. The year 2002 was a logical choice since there were no event conflicts in the winter, and USA Swimming was selecting three teams off the summer meet. In these tables (Table 2. – Women, Table 3 - Men) I looked only at those athletes that competed in the same events in both the NCAA's and the Summer Nationals, and didn't involve those athletes that chose not to swim, or swam in a different event. The table is broken down to reflect this process. I looked to see how many athletes who finaled (I separated 1-8 and 9-16) at the NCAA's came back in the summer and qualified in these four areas:

1. Finals
2. Consolation finals
3. Bonus
4. Failed to make the Top 24

I also looked at how those athletes that finaled at the NCAA's in a longer event came back to be able to final in those 4 areas in events of shorter duration at the Summer Nationals (EG. 500 yd free to 200 meter free). I highlighted these lines with a grey color in the charts, and it should be noted that all percentages in the table used only the event to event numbers (200yd fly to 200 m fly), and none of the longer to shorter numbers were included (200yd fly to 100m fly).

Looking at the charts these facts stand out.

1. I expected the 200-yard events to contribute a greater number of finalists in the 100 meters… this didn't happen. It was noticeable that the freestyles were the weakest events, and although one could speculate that freestyle events are the most competitive, the fact that only 8.3% of the women who made the finals at the NCAA's went on to final in the summer was pretty awful. The fact that 37.5% of the freestylers who placed in the Top 16 at the NCAA's failed to make the top 24 in the summer was disturbing at the very least.

2. Backstroke and Breaststroke seemed to be pretty consistent in the high thirty to forty percent, and the talent pool argument fits here as well since these events are thinner. However approximately 20% of the NCAA's top 16 qualifiers failed to make the Top 24 in the summer.

3. There were no obvious points to explain the disparity in butterfly, (Women 54% to Men 26%) however, over 30% of Top 16 athletes failed to make the Top 24 at the summer Nationals. Overall, over of a quarter of the NCAA Top 16 failed to have any impact in the evening events at the summer Nationals (Women 28%, Men 26% - 40 out of 150 swims/races)

TABLE 2

WOMEN									
PLACING AT THE NATIONALS	**IN THE FINALS**		**IN THE CONSOLS**		**IN THE BONUS**		**WAS A NON FINALIST**		**# of NCAA Athletes Competing at The Summer Nationals**
CAME FROM THIS NCAA RANKING	**1-8**	**9-16**	**1-8**	**9-16**	**1-8**	**9-16**	**1-8**	**9-16**	
50 FR	1	0	2	1	0	2	2	0	8
100 to 50**	1	0	0	2	0	1	2	1	7
100FR	1	0	1	0	0	3	4	2	11
200 to 100**	1	0	1	0	1	0	1	0	4
200FR	0	0	2	1	1	0	0	1	5
500 to 200**	0	0	3	1	0	0	0	3	7
FR %	8.3%	0.0%	20.8%	8.3%	4.2%	20.8%	25.0%	12.5%	24
100BK	2	0	0	0	2	0	2	1	7
200 to 100**	3	1	1	0	0	1	1	2	9
200BK	4	1	1	1	0	0	0	2	9
BK %	37.5%	6.3%	6.3%	6.3%	12.5%	0.0%	12.5%	18.8%	16
100BR	3	0	1	2	0	1	0	0	7
200 to 100**	3	1	1	2	0	0	0	0	7
200BR	3	0	1	0	0	1	0	2	7
BR PERCENTAGES	37.5%	0.0%	12.5%	12.5%	0.0%	12.5%	0.0%	12.5%	14
100FL	3	0	2	1	0	1	1	2	10
200 to 100**	1	0	1	1	0	0	1	0	4
200FL	3	1	1	1	0	0	0	1	7
FL %	54.5%	9.1%	27.3%	18.2%	0.0%	9.1%	9.1%	27.3%	17
PURE EVENT TOTALS	20	2	11	7	3	8	9	11	71
PERCENTAGE OF TOTAL	28.2%	2.8%	15.5%	9.9%	4.2%	11.3%	12.7%	15.5%	

** These lines are not included in the percentage stats and are in here to indicate how many athletes that swam a
longer event at the NCAA's qualified for a shorter event at the Summer Nationals. Logic being that the longer
events swim time is in some ways comparable to the shorter events swim time at the summer Nationals

TABLE 3

MEN									
PLACING AT THE NATIONALS	**IN THE FINALS**		**IN THE CONSOLS**		**IN THE BONUS**		**WAS A NON FINALIST**		**# of NCAA Athletes Competing at The Summer Nationals**
CAME FROM THIS NCAA RANKING	**1-8**	**9-16**	**1-8**	**9-16**	**1-8**	**9-16**	**1-8**	**9-16**	
50 FR	1	1	3	3	1	0	2	0	11
100 to 50**	1	1	1	1	0	1	2	0	7
100FR	1	1	0	2	0	0	2	0	6
200 to 100**	0	0	1	1	1	0	0	2	5
200FR	2	0	0	0	1	2	0	3	8
500 to 200**	3	0	0	0	1	2	3	1	10
FR %	16.0%	8.0%	12.0%	20.0%	8.0%	8.0%	16.0%	12.0%	25
100BK	4	1	1	0	0	1	1	0	8
200 to 100**	2	0	0	1	1	1	0	1	6
200BK	2	0	1	0	0	0	1	2	6
BK %	37.5%	6.3%	12.5%	0.0%	0.0%	6.3%	12.5%	12.5%	14
100BR	4	1	3	1	0	0	0	0	9
200 to 100**	3	1	3	1	0	1	0	2	11
200BR	3	1	2	1	0	0	1	2	10
BR %	41.2%	11.8%	29.4%	11.8%	0.0%	0.0%	5.9%	11.8%	19
100FL	3	1	1	1	0	1	2	2	11
200 to 100**	0	1	2	2	0	0	3	1	9
200FL	2	2	2	0	1	1	1	1	10
FL %	26.3%	15.8%	15.8%	5.3%	5.3%	10.5%	15.8%	15.8%	21
PURE EVENT TOTALS	22	8	13	8	3	5	10	10	79
PERCENTAGE OF TOTAL	27.8%	10.1%	16.5%	10.1%	3.8%	6.3%	12.7%	12.7%	
** These lines are not included in the percentage stats and are in here to indicate how many athletes that swam a longer event at the NCAA's qualified for a shorter event at the Summer Nationals. Logic being that the longer events swim time is in some ways comparable to the shorter events swim time at the summer Nationals									

As a country we spend approximately 8 months of the year focused on SCY swimming and 4 months of the year on LCM swimming. Although during Olympic and World Championship years the flavor stirs towards LCM competition, we still spend a significant amount of time training and competing in a short course environment.

In the past two quadreniums we've changed our indoor focus to host a LCM championship, and thereby hopefully change the training emphasis with regards to the preparation for the event. However, the majority of the country's swim programs are limited facility wise (no LCM access), and still entertain SCY training and meets during the year. The NCAA programs although having a much greater opportunity to train and focus on LCM, in general tend to choose SCY and prepare their athletes almost exclusively for SCY competition.

Although we are unable to measure our success on a worldwide playing field with regard to SCY competition, our ability (as a country) to produce significant performances in SCY competition remains undaunted. The depth of elite level performance at the college level doesn't convert at all to long course meters, and in general many of our top-level swimmers in SCY are unable to match these same performances LCM.

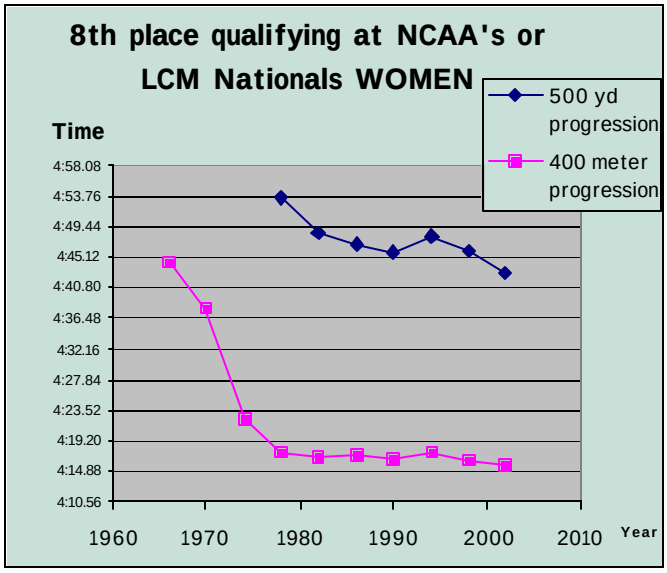
In the 60's & 70's, our best coaches were mostly involved in club programs. Our focus was centered around Long Course success, and the majority of the clubs across the country were involved in endurance oriented training. However, many of those coaches have gradually gravitated to the college ranks, and have taken their talents and focus into the SCY environment. During the 80's event performance progressions stagnated on the downside of the huge volume push of the 70's, and the only major shifts in performance improvement has come via the short course pool. To illustrate this stagnation, and to highlight the subtle change in depth progression, I looked at the relationship between the 500-yard performances at the NCAA's and the 400-meter performance during the same years Summer Nationals from 1966 to 2002. Table 4 and Chart 1 (Women) show the progression through the years, and it's interesting to note the significant progression that occurred up until 1978, and the subsequent plateau in these events since. For more information on this subject see the article on a "Statistical look at USA Swimming's future" http://www.usa-swimming.org/programs/template.pl?opt=coaches&pubid=824

Table 4

A COMPARISON BETWEEN THE 500 YD FREE PROGRESSION AND THE 400 METER FREE PROGRESSION

	WOMEN					MEN			
	NCAA'S		SUMMER NATS			NCAA'S		SUMMER NATS	
	Prelim seed		Prelim seed			Prelim seed		Prelim seed	
	1st	8th	1st	8th		1st	8th	1st	8th
1966			4:41.50	4:44.60				4:11.80	4:18.20
1970			4:30.36	4:37.92				4:05.07	4:07.11
1974#			4:17.92	4:22.23		4:27.23	4:30.78	3:56.96	4:01.87
1978*	4:49.40	4:53.45	4:10.70	4:17.62		4:21.19	4:24.44	3:53.66	3:58.58
1982	4:44.84	4:48.64	4:11.82	4:16.80		4:20.55	4:23.34	3:54.07	3:58.65
1986	4:43.17	4:47.05	4:11.18	4:17.15		4:18.01	4:20.50	3:51.35	3:56.24
1990	4:39.03	4:45.82	4:12.68	4:16.77		4:15.96	4:19.10	3:51.85	3:55.59
1994	4:43.31	4:48.18	4:13.46	4:17.58		4:12.44	4:20.42	3:54.43	3:57.07
1998	4:39.97	4:46.06	4:12.69	4:16.54		4:18.25	4:20.20	3:52.49	3:56.47
2002##	4:41.35	4:42.99	4:09.81	4:15.73		4:16.12	4:18.76	3:52.62	3:55.20

NOTES
In 1974 the lycra suit was introduced to swimming
* In 1978 the results for the 500 yd free were taken from the 1979 AIAW Nationals since the 1978 AIAW results were very sparse
In 2000 the full body suit was introduced



In a general overview of the college group, they for the most part tend to be very good at developing either great SCY yards performances or LCM performances, but very few are good in both courses, and very rarely are able to do it in the same season unless the preparation focus has been on LCM competition. The performance at the Women's NCAA's in 1992 was a great example of this fact. Since this is group who is paid to produce performances in the short pool it stands to reason that they will gravitate to programs and modalities that are most successful to swimming short course. It also stands to reason that they would have the tendency to use these same strategies when preparing their athletes for long course.

Issues that revolve around the training environment

In talking to and listening to coaches there seems to be very little difference in how they prepare their athletes for LCM competition. In general coaches keep the same basic training plan & shift the training environment from a SCY pool to a LCM pool. Some adjust the dry land plan to reflect a little less emphasis on strength gains on land, however many don't shift away from the land strength values that can be a boon to short course swimming. These areas are specific to short course swimming, and although they don't necessarily impede performance, they could have a significant effect on long course results.

- **Land Training**. With an increased emphasis on strength gains on land, athletes can jam the tempo between the walls and survive with very little emphasis on water specific strength or endurance.
- **Reduced actual swim time**. This puts a lot more emphasis on starting, turning, and the ability to kick fast underwater. Although these abilities transfer well to long course, their component percentages decrease significantly and the potential effect further diffuses the athlete/coaches ability to place a value on the importance on the swimming portion of the race. Along with this area, there is a huge difference in men and women when it comes to swimming time, and although we tend to train female athletes a little differently than we do males, this alone points out the need to approach the season with a different tactic (more endurance oriented) for those swimmers who average 10 or more seconds of swim time per lap in all events.
- **Technique**. There is less need for any emphasis on technique or efficiency since strength /power gains on land in conjunction with tempo increases can offset those needs.
- **Non-swimming time**. The amount of time where the athlete is in a recovery mode using different muscles is significant in short course, and reinforces the ability to follow the strategy of "jamming" the strength/power and lesser technique between the walls.
- **Tempo or stroke rates**. With extended wall recovery times, higher stroke rates can be employed to maintain swimming speed.

- **Limited endurance requirements**. All events 200 and less in the short pool require a limited amount of actual swimming time.

Things that can be done long course to focus on that racing environment:

Tempo or stroke rates. Since all adaptation and development in swimming is essentially neural based, training and adapting to a higher firing rate in the short pool could be transferred to the long pool. This will require a combination of improved endurance or improved efficiency, but it is one of the few areas that can have a positive effect if understood and used correctly.

To follow on the neural concept. A common denominator in long course race analysis (USA athletes) is the constant stroke rate degradation that occurs on every lap of every race. It is the extreme exception when I see an athlete maintain their stroke rate across the pool, and in some cases there is a significant drop off in stroke rate during the second half of each lap of the race. Bottom line here is the fact that the athlete is unable to sustain their neural function all the way across the pool and this leads to significant losses that aren't that easy to see. To illustrate how critical this is, let's look at an example of a female 200-meter freestyler. To make it simple let's say the athlete's goal actual swimming portion time (removing turns & push offs) is 28 seconds on the 2nd, 3rd, & 4th laps of the race. We'll also stipulate that she is attempting to hold a stroke rate of 1.4 seconds per cycle or 42.85 cycles per minute, and that she suddenly drops her stroke rate to a lower level at exactly 14 seconds into the swim portion of each lap. The following table (Table 5) shows you the effect of the drop-off during those 14 seconds of the race.

TABLE 5

HALF LAP TIME	SEC'S PER CYCLE	CYCLES PER MIN	CHANGE IN RATE	SEC'S PER CYCLE	CYCLES PER MIN	CHANGE IN TIME PER 50	IMPACT ON RACE
14	1.40	42.86	**0.01**	1.41	42.25	0.10	**0.30**
14	1.40	42.86	**0.02**	1.42	41.67	0.20	**0.60**
14	1.40	42.86	**0.03**	1.43	41.10	0.30	**0.90**
14	1.40	42.86	**0.04**	1.44	40.54	0.40	**1.20**

If we took this principle one step further and applied it to the swim that broke the World Record in the Men's 200-meter backstroke, we'd able to see this kind of effect "live" so to speak. The following is the race analysis from that performance (Table 6), and the potential improvements (Table 7) that might have made a difference in that race, or could make a difference in any subsequent performances.

Table 6

	Breakout, (sec)	Break dist	Time	Tempo (C/Min) / Seconds per cycle			Turn time	DPC, (M/C.)
50	5.34	12.25	27.75	44.6/1.35	42.10/1.43	40.30/1.49	1.06	2.54
100	4.22	8.75	56.60	42.60/1.41	40.70/1.47	41.30/1.45	1.04	2.54
150	3.78	8.00	1:26.05	44.10/1.36	41.8/1.44	42.60/1.41	1.14	2.41
200	4.09	8.50	1:55.15	46.10/1.30	43.20/1.39	46.40/1.29	0.00	2.21

I highlighted the rates during the mid pool section where in some cases there's a considerable drop-off in tempo during the swim. If the athlete was able to maintain a faster rate during the mid pool (highlighted in yellow) portion of the race, the time in this race could have been a lot faster.

Table 7

Change in cycle rate (faster)	Lap 1 impact	Lap 2 impact	Lap 3 impact	Lap 4 impact	**Race impact**
0.01	0.05	0.06	0.06	0.07	**0.24**
0.02	0.1	0.12	0.12	0.13	**0.47**
0.03	0.15	0.17	0.18	0.19	**0.69**

(It should be noted that this is a lot easier to say than do, but it does illustrate how minor changes can impact paces.)

On the average we see significant drop-offs at the first long course meet of the season (well in excess of .03 sec's per cycle), and not nearly as much a drop off towards the end of the season. At the summer Nationals athletes range between .02 to .04 seconds per cycle. This could be a simple fact of poor rate selection to begin the lap, or the inability of the athlete to maintain neural function during the lap. This inability to maintain neural function is directly related to training, and as you can see the demands to maintain function in the long pool is significantly greater than in the short pool. If we take out the starting and finishing laps and then look at the men's 200 backstroke, you'll note another significant difference in the dynamics of the middle portion of the race. In short course the average actual swim time per lap (2 through 7) is 7.8 seconds with a 5.4 second break from this activity during the turns and underwater portion. In long course (laps 2 & 3) this changes to 25.4 seconds with a break portion of 4.8 seconds. (See Table 8)

Table 8

MEN'S 200 BACK	**Average swim time per lap**	**Average turn time**	**Average u/water kick time**	**Total non swim time per lap**
SCY	**7.87**	**1.42**	**4.05**	**5.47**
LCM	**25.43**	**1.40**	**3.45**	**4.85**

The 200-meter version is a completely different race, and is one that will require a much higher neuromuscular endurance component. Since maintaining distance per stroke is very much involved in the process, having strength/power endurance is also very important. With this in mind, more work should be done at the stroke rates and intensity levels that will prepare the athlete for this increased neural demand.

The relationship between land and water strength. One of the evolutionary aspects of short pool preparation has been the increased emphasis on land strength training. This has transferred very well into short pool performance simply because of the limited swim portions, and the increased amount of rest between each lap of the race. There is a much higher requirement in the area of "water strength" when competing in the long pool, and coaches have to become very conscious of the relationship between these two elements (Land/water strength). In tying this together with the stroke rate component, work on land should be more in line with swimming specific movements, and a greater emphasis should be placed on "in the water" strength training. When doing both land and water strength training, stimulating neural function at race frequencies should be a major portion of the training regimen.

*** See article on Land Water Strength in Coaches Quarterly Volume 9 Number 1. or connect to this Internet address*
http://www.usa-swimming.org/programs/template.pl?opt=coaches&pubid=1955

The level of aerobic conditioning.
Since this article has focused on the 200 and shorter events, I'll keep my comments focused on those event needs. Aerobic or cardio vascular conditioning is essential in most coaches' minds as being the staple that makes or breaks an athlete. I can agree with that, however I believe that the athlete's ability to train at VO2 Max and higher (race specific frequencies) will ultimately determine their potential in competition. With this in mind RECOVERY from training becomes a major issue. Due to the level of high intensity training needed for successful long pool swimming, aerobic conditioning becomes a major component in the athlete's ability to train longer or harder at a higher frequency (workouts) without breaking down. Cardio conditioning isn't as essential in the short pool, and coaches who expect similar long pool results with the same level of training are never going to put their athletes in a position where they haven't trained hard enough to sustain neural function.

Issues involving a talent driven environment

Going back to the 60's and 70's, we were improving in leaps and bounds for a number of reasons. As the arms race began to cool down, the volume race was in full cry, and clubs joined the accepted challenge of besting their neighbors by going more miles per week. At the same time athletes were less distracted and far more willing to slog through the miles to achieve their goals than they are today. During that period, working harder than your competition made the difference, getting to Nationals was the best game in town, and long course was the measure of real success. Today's training world caters to a talent-based environment that shapes programs to suit the needs of the athlete, and "training just hard enough" without losing the athlete has become the rule.

Times change, paradigms shift, coaches changed, and most of all athletes changed. More for less watered down the battle cry, the drive to be recognized as a member of the "animal lane" was put out to pasture, and short course training gained a stronger foothold. The move by many of our great coaches into the collegiate ranks during the 80's changed the amount of emphasis on the short course season, and athletes and coaches began to focus and measure their success to a large degree on what it took to be successful in the short pool. This over time jaundiced the athlete's ability to understand what their true potential was, and essentially eliminated many an athlete's chances of ever developing their talent enough to achieve full potential in the long course pool. Even the 90's drive

led by the National Team Director Dennis Pursley to change our Indoor National Championship to a permanent long course meet, failed to dent the emphasis that was now creating a huge gap in our understanding of the two courses.

During this period the NCAA's changed their qualifying criteria, added the short relays and forced college coaches to knuckle down and really focus on what worked in the short pool. The USA is blessed with many great coaches, and although there was a huge protest about the changes at the time, they have adjusted to overcome this challenge. Automatic qualifying times that were first seen as "outrageous" are getting faster, and athletes and coaches have stepped up to the blocks with regards to achieving these times in season without shaving. The faster cuts times have driven many coaches to "take a shot at cuts" in early December not wanting to gamble one shot at it in the spring, and the subsequent result has shortened the base period devoted to endurance training. Dual meet performances that were considered amazing in the late 70's are average to non-scoring at best in today's world, and programs that "work hard" in season and accept the slower times are few and far between. As this compromising solution evolved, long course training became less important during the short season, and volume totals dropped. Tapers were extended, and athletes became accustomed to being able to perform despite long periods where they didn't return to "hard work".

The fault of many athletes has been their belief that the 5-8 week taper that has always proven successful in the short pool should also be successful in the long pool. The second trap that ensnares many an athlete's understanding is their first year in college. Many arrive in college from aerobic based backgrounds that were very endurance based both on land and water, and are introduced to high volume strength/power based speed training on land, low volume training in the water. They get misdirected by their quantum leap performances, and subsequently suffer from a biased perspective based on results that are enhanced by their success in a team-based environment. There have been a slew of examples in the past where athletes were fooled by short course successes, and very few who fall prey to this kind of logic recognize the need to go back to their aerobic roots in order to re-elevate their performance to earlier levels. With the diminishing USA based talent pool (especially men), and the 90's athlete looking for an easier path to success, coaches have adjusted to more creative ways to maintain focus and commitment. It is my belief that many college programs have compromised a long course work ethic for "easier more athlete friendly" programs that are successful short course, but leave a lot of athletes short when trying to compete under this same philosophy long course.

The catch 22 in this rationale is that coaches will focus their training regimens/programs on the success of their talented athletes. Those athletes who would normally need to work "harder" in order to be competitive in any arena would be severely limited in the long pool, and never come close to identifying what it would take for that athlete to be successful in long course. In most cases this kind of athlete shuns long course competition since it's generally perceived as being disadvantageous to their level of talent. When faced with the choice of working even harder to try and be successful long course, or stay the same and be part of a college team, most athletes opt for the short course commitment and in many cases see the long course period as the "off" season. Although athletes will say that they are opting to work during the summer with their college teammates, many of them are choosing to not go back to the club endurance "perceived hard work" environment.

Since many college coaches recruit athletes that are successful in sprint-oriented events, and have shown aptitude in the short pool. This in essence propagates the problem since

many club/high school coaches will gear their programs to this recruiting approach, and begin the cycle of abridged returns at an even younger age.

The bottom line in this thought is that all athletes could be limited by their "easy path" to success in short course. The increased emphasis on the walls only serves to exacerbate the understanding of the endurance needs in the swimming portion of the race. However, the more talented the athlete, the "easier" it is to be successful, and therefore natural ability becomes far more limiting in the long run when the talented athlete attempts to compete internationally using training strategies or short cuts that work for short course events.

I realize that within the framework of this article that I picked on the Men's 200 backstroke to illustrate the discrepancies between the two courses. This is potentially dangerous ground since many coaches will say " we currently dominate the rest of the world in backstroke, so regardless of what you say, we must be doing something right". I'll counter by saying that looking at a "perfect race" and deciding that all athletes should swim their race "that way', will always limit your ability to explore potential improvement. Because Ian Thorpe dominates the rest of the world in freestyle, should swimmers swim freestyle the way Ian Thorpe does. The answer is NO. We can only go forward if we continually question what we are currently doing, and we are always looking for ways to get more out of what we do. Regardless of whether limitations stem from environmental or talent/ability driven issues, there is no doubt that we need to develop a better understanding of what it takes to fully develop our talent for long course swimming. We seemed to have a good sense of what it took in the 60's and 70's, but in recent decades, have lost that feel or formula with the advent of short pool emphasis. There is no doubt in my mind that USA Swimming would be far better off if the NCAA changed their championship season to a long course format, and given time and adjustment by our great coaches to this format, we'd eventually place ourselves in a position where no country could ever hope to challenge us in the International arena.