

AUSTRALIAN MASTERS SWIMMING COACHES NEWSLETTER



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Welcome to the Christmas Edition of AMSCN. We have a bumper issue for you loaded with plenty of original ideas. It was great to get some readers to put pen to paper, one being a fellow club member of Powerpoints - a literary gentleman who has penned a rather lyrical but fictional account of a fellow swimmer, who we can all recognise. So that you understand some of the references the author makes in his story, which appears over the page, a little background on my club will give you a greater appreciation while you read.

Powerpoints was formed by members of the Powerhouse Water Polo Club and members of both Point Leo and Point Lonsdale Surf Lifesaving Clubs. Our club colours are Black, green and white.

Sue Needham has some excellent advice on page 3 with her article "Some benefits of training alone", and I have had more than my share of input with my "Perspective" on the pre-race warmup (page 4) as well as part 2 of "Measuring Performance"(page9), the first of which appeared in the last issue.

New Zealand coach Pic Parkhouse has an interesting article on "A Short History of the Development of Swimming Strokes (page 18); US coach Judy Bonning writes about "the ABC's of Energy Systems, and Marvin Schwartz espouses the benefits of coaching integrated groups of Masters and Age Groupers.

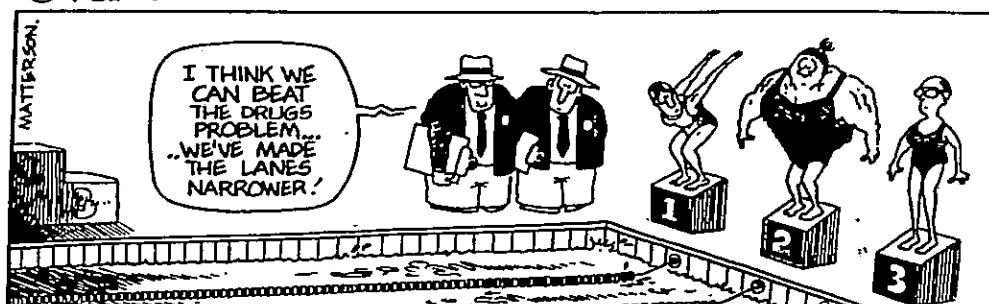
This later topic is something I have practised for the last twelve years. When I began, my fledgling age group team aspired to keep pace with my elite Master swimmers. Nowadays it is the other way round! As my squad evolved the whole standard lifted and benefited by the other's presence.

I'm sure you will agree that there is something in this issue for everyone. Happy reading and may you be able to put into practise all that you learn.

*On behalf of the AUSSI BOARD of DIRECTORS
best wishes for the upcoming swimming season and
may you have a safe, happy Christmas and a
prosperous New Year.*



Over the line



From the Mercury 6/7/96

"Dear Ed",

1st April 1996

While it was pleasing to see so many Pointers gathered on Tuesday last, I'm sure there were none amongst us who were not saddened by the passing of our training mate and swimming comrade, "The Professor" Jonathan Murray. Emeritus in the Department of History at the University, Jon swam with the Club far longer than most of us care to admit we remember. He was conspicuous by his absence from both the the Long Course championships and the Prahran Classic this year: he'd been a perennial fixture at both venues as a participant before being pool-decked by his final illness, and thereafter, until his passing, noticeable by "that" hat, stop watch around his neck, and note book under his arm.

It is about this notebook that I am now prompted to write, for it was passed on to me by his widow, Ondine, who knew of the interest I shared in his notes and who expressed the Murray's wish that I complete for publication the work he had begun. While I am both flattered and daunted by the task, I realise now that completing the Prof's work will be some time coming, yet I thought your readers might be interested in an interim report.

The initial set of notes seems to be an outline for an article, based on his observations over the years at several suburban pools, tentatively titled "The Fast Lane". Rather than a celebration of speed or of life style, its intention would be to query (in the nicest possible way) why it was always so hard to find room to swim in the lane pool management had designated "FAST" while space abounded in those labelled "MEDIUM" and (even) "SLOW".

To Jon it seemed as if every Tom, Dick and Harry ('though certainly not our Tom, Dick or Harry), thrasher and splasher, were inexorably drawn to swim in that lane by the very signs that were intended to warn them off; that by swimming in the FAST lane, they too would somehow become fast themselves. And further, this was not a lazy substitute for the work of training nor of the effort of stroke correcting, for these men (yes Ed, it was almost always men) would knock themselves out, exhaust themselves in the effort just to get from one end of the pool to the other.

It became obvious to Jon that the issue was not one of skill nor talent nor will, but of ego. His suggestion (and this is only my inference) would have been to guide pool management (had guidance been sought) towards its assumed goal of equal distribution of lane usage by re-marking the lanes, retaining FAST if so desired, but deleting the pejorative MEDIUM and SLOW in favour of the less demeaning "QUICK" or

"GRACEFUL" or "SWIFT" or "EFFORTLESS". Thus might equity be achieved.

The second, and larger, portion of "The Prof's" note books is even less well formed than the first, but it is so obviously an attempt to document for posterity the origins of the Club, to locate those antecedents that make reference to the Power of house fame and the Points both Leo and Lonsdale almost after thoughts.

While the unjumbling of these has only just begun, I cannot resist the temptation to preview; we ignore at our peril the attention Jon calls to Shakespeare's "McBeth". As the doomed king is deserted one by one of his followers, his fear of Macduff only grows:

"The rise in his power points to our demise"
(Act V, scene 1)

Jon would have us believe that this early (1610) reference however hidden, clearly places us in the forefront of Masters Swimming (and North Lodge be damned), but he doesn't stop there. Remember, we are dealing with an historian.

From this small allusion from the height of the English renaissance, Jon next takes us back, back to the Italy of the cinquecento, not to literature but to painting. In the Chapel de San Keireno there is a small fresco attributed to Leonardo (and whether the attribution is accurate or not has little to do with our present interest). Its subject (and title) was not an uncommon one, "Christ Walking on the Waters", but Jon would have us believe that this actually depicts popular Pointer Jesus before his DQ for walking, relegating him to swimming footnotes in much the same fashion as Ian Meckiff was banished from cricket for chucking.

To enhance his claim, Jon invites our attention to the fact that in this painting Jesus enrobed, not in togs, displays the familiar black, green and white stripes that have struck fear into the hearts of many a non-believer, the colours that we all recognise and still wear. And whether this is historically accurate or simply an anachronism depicting a fashion popular during Leonardo's (or school of) time hardly alters the argument.

But the notes do not end there, even though this is as far as I have deciphered. Homer's "Iliad" I still must translate; "Don Quixote" I must reread. If I can clear copyright regulations, and you can up the printing technology, I hope to provide a copy of the above mentioned painting for our next edition. In the meantime, while I dedicate my time and energy to the memory of Professor Jonathan Murray's good works, may you all train well, do an extra lap for me, and I'll be up to 5k a week in no time!

Natatorially, Herbert O

Some Benefits of Training Alone

by Sue Needham
Coach of the Sunshine Coast Masters

Nothing is as effective as organised squad training, supervised by a coach!

Having said that however, there are times when it is necessary to train alone, and if this happens to you the following tips may help you gain the maximum advantages from those lone training sessions.

Firstly, *make a goal* for the session and try to achieve it. That goal could simply be to finish the program you've set, or to improve your training time for a specific swim.

Secondly, *be specific!* A lone training session gives you the opportunity to practice your specialty. Practice all the skills which make up your favoured stroke at your best distance and then complete a heart rate set in the full stroke. How often do you get the chance to swim your own favourite "race" in training?

Thirdly, *pick your time* and you could be lucky to score a lane to yourself. Observe the crowded times and then avoid them! It's a luxury training with only one to a lane, but you'll find practising swimming down the black line and turning 'straight on' pays dividends.

Fourthly, *don't get distracted.* You'll need to call on all those mental powers to dodge the local chatterbox. Remain focussed and determined and the session will pay off.

Fifth and finally, *always think POSITIVE.* Concentrate only on the benefits of a lone session and completely ignore any negative aspects which may crop up.

Call on your club coach to identify any particular aspects of your stroke or fitness which needs attention, and build your training program around these aspects. Arrange to copy the current squad training programs if you are in doubt about what to do.

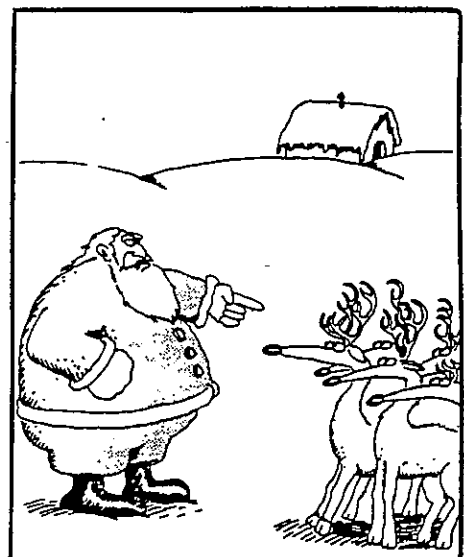
I've personally found this year I've improved over all distances and can attribute part of that progress to my lone (but not lonely) training sessions. Other factors which I can identify as improvers are; better attention to diet; lots of walking (I have a dog who walks me 14 x 20 minutes a week); stroke correction and fine tuning starts, turns and finishes.

GOOD SWIMMING to all the lone swimmers, you can achieve wonders!

Just to show what can be accomplished by training alone, Belgium's Fred deBurghraeve became the first Belgium swimmer to ever win an Olympic gold medal. DeBurghraeve who broke the world record 100m Breaststroke in the heats in Atlanta and then on to win the gold medal, trains alone. The 23 year old receives his workouts from his coach, 60 miles away, by phone or fax. His coach reportedly travels once a week to look in on his swimmer, monitor his progress and check his technique.

Did you know that Sheila Taormina became the first Masters swimmer ever to win an Olympic gold medal. The 26 year old member of the US Olympic team placed sixth in the US Olympic Trials earlier this year, earning a berth on the team as an alternate relay member for the Women's 800m Freestyle Relay. Unexpectedly she swam the fastest split (2.00.57) in the prelims, earning herself a berth in the winning finals team. Taormina had come out of retirement for her Olympic campaign and we expect she was delighted with the result.

Another victory for older swimmers at the Olympics went to 28 year old German twins Bjorn and Bengtt Zikarsky, who live and swim in Los Angeles. They were both members of Germany's bronze medal-winning 400 freestyle relay.



"And I've only one thing to say about all these complaints I've been hearing about ... venison!"

PERSPECTIVE

The Pre-race warmup

The following question was asked at the Victorian AUSSI Short Course Championships September 1996.

What did you do for a warm up today?

"I did 600m F/s, 200m Breast Kick and 200m Breast to prepare for my 100m Breaststroke race. I also stretched before and after my warmup." Branch President Clyde McMillan from Malvin Marlins - 48 years.

"I was in the first heat of the first race which was the 400m Freestyle. I regret that circumstances prevented me from doing a warmup." Bob McCabe - 77 - North Lodge Neptunes.

"I swam the 400m Freestyle as my warmup" Nancy Ayers - 73- North Lodge Neptunes.

"I swam until I felt comfortable; about 400m." Chris Dettman - 44 - North Lodge Neptunes.

"I swam 200m mixing strokes as my warmup for the 100m Breaststroke." Mike Taylor - 32 North Lodge Neptunes.

"I did a 400m Backstroke so my warmup was a 200m Freestyle plus I practised my Backstroke turns and finishes by counting my strokes from the flags." Helen Jackson - 77 - Powerpoints

"To warmup for the 50m Butterfly I swam 200m Freestyle; 2x100m I.M.; 5-6 starts; 100m Backstroke stretching out; 4x50m sprinting 30m and easy 20m; and another 200m to relax." Amanda Bilborough-Tokai - 29 - Frankston Peninsula

"I did 5-600m of technique work to warmup for the 400m Freestyle." Attila Tokai - Frankston Peninsula.

"I arrived late and only managed a 20 minute warmup before I had to marshal for the 200m Freestyle. I did a descending pyramid of 200m-150m-100m-50m followed by 5x50m Freestyle SCAT (see article elsewhere in this issue for a full description - Ed.) reducing 1 to 5." Barbara Collins - 43 Powerpoints.

"For the 100m Breaststroke I did 400m Free-

style; 100m Backstroke; 200m Freestyle; 4x25m exploding the first 3 strokes - Breaststroke; another 200m Freestyle and finished with a 100m Breaststroke." Mark Gillette - 27 - Powerpoints (Mark set a National Record following this warmup in a 1.08.30 for his 100m Breaststroke - Ed.)

"I warmed up for both the 100m Breaststroke and the 200m Backstroke which followed. I started with a 200m Freestyle; 4x25m Backstroke sprints; 200m easy Backstroke then finished with 4x25m Breaststroke sprints." Elen Pape - 35 - Powerpoints.

"For the 100m Breaststroke I swam 300m then 200m as 12.5m easy, 12.5m hard." Ian Dear Malvern Marlins.

"I warmed up for the 50m Butterfly with a 200m Freestyle; 100m Fly kick; 100m Fly drill; 2x25msprints." Linda Denehy - 41- Malvern Marlins.

"I did about 15 laps of the diving pool." Vivien Merrill - 48 - Malvern Marlins.

The above information was both illuminating and shocking in its revelations of the habits of AUSSI Masters Swimmers, in relation to their pre race warmups. I was suprised to learn that the prevailing attitude was either 'anything would do' or 'less is best'. It seems that many people feel that warming up takes away much needed energy for racing.

Warmups in general were neither planned nor well thought out and it leads me to believe that there is a lot of ignorance out there. It also leads me to think that these swimmers either have little access to coaching or the coaches are failing their swimmers.

One elderly gentleman even confided that he didn't do any pre race warmup. He claimed to never push himself in training or in races so he didn't need one. (Continued page 8)



DIAGNOSIS

Itchy Feet

TINEA

What is it?

Simply put, tinea is a fungal infection of the foot, causing an itchy red rash. It usually starts between the third and fourth toes and from there spreads to the other toes. By the time it starts to

spread, it is usually so uncomfortable, oozy and smelly that those unlucky enough to get it, go off to seek some help.

"Itchiness between the toes and really smelly socks are the most common symptoms."

What's the cause?

Tinea is caused by a type of fungus called a "dermatophyte". Like its close relative the mushroom, the dermatophyte loves the warm, wet conditions which give it

somewhere to grow, and the darkness which is important for its delicate process of reproduction. A pair of sweaty feet in dirty old runners provides the ideal environment for these bugs, which is why tinea usually occurs on the feet. You can pick it up just about anywhere, but most commonly around the edges of swimming pools and showers at sports clubs or gyms.

What are the symptoms?

Itchiness between the toes and really smelly socks are the most common symptoms. The itchiness gets worse if you're walking around or exercising, when the feet start to sweat. Sometimes the itchiness can be so severe that the feet feel like they're on fire. If your feet sweat a bit in bed, the itch can drive you so crazy it will stop you from sleeping.

A quick look between the toes usually tells the tale: lots of cracks, flakey white skin and an angry red rash. Checking the skin on the rest of the foot is also important because the rash often spreads to, or in some cases may start on, the sole of the foot.

Some people show no symptoms - perhaps because they picked up the tinea very recently, or because their feet are too dry and cool to allow the fungus to replicate and spread. Treating these mild rashes when they are not irritating will prevent a nasty outbreak at a later stage.

Why does it itch?

The bugs cause itching so they can spread to other places and other people. The fungus irritates the skin, causing itchiness and redness. When you scratch it, some of the fungus is deposited under your nails. If there is a break in the skin under the nail, the fungus can infect there; and when you scratch elsewhere, the fungus can spread to that site too.

Where else?

Dermatophytes are a fairly hardy fungi. Even though they prefer places like the feet, they can grow just about anywhere on the skin. Groin fungal infections are the next most common tinea problem after the feet. Next come the scalp and other 'dry' areas of the skin. These dry tinea cause a rash quite different in appearance to those of the groin and feet, usually circular with a crusty crumbling edge and a pale centre. As they look a bit like a worm is burrowing around under the skin, they are often referred to as "ringworm".

What's the treatment?

Good foot hygiene is the first step towards cure. Washing the feet twice daily in warm water with a mild soap, drying thoroughly and remembering to wear thongs in other people's showers are the most important things. Keeping the feet dry as much as possible also helps. If you can, walk around bare-foot.

For mild infections use a mild antifungal cream. This must be applied twice daily for at least five or six weeks. While you're at the pharmacist, buy some anti fungal powder to shake into your shoes and socks each time before putting them on. This will kill any fungi that may be lurking in them.

Understanding the life cycle of the fungi gives you a better chance to get rid of the infection. The infection which first takes hold is caused by the adult dermatophyte. Under the microscope, these look like little shrubs covered with little seed-like pods called "spores". These spores grow into immature fungi - little shrubs with no seeds. The antifungal cream will kill the adult dermatophyte very effectively, but it is less effective on the spores. It is therefore important to continue to use the cream and powder while the spores grow into immature fungi, killing them off before they reach maturity and develop spores again.

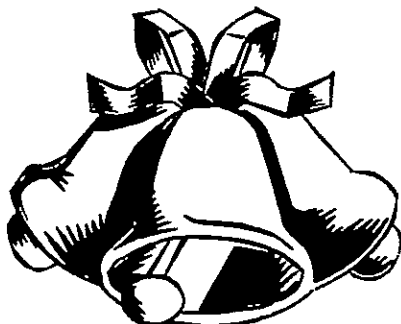
Itchy Feet (cont.)

In most cases, the tinea will be cured by the effective use of cream and powder, and by proper attention to hygiene. However, if you just can't manage to use the cream twice a day for so many weeks, or if, despite your efforts, the tinea bug is still beating you, tablets can help. There are several different types available, and your local GP can prescribe a course for you if you need them.

Written by Dr Malcolm Clarke, a practising GP.

The material in this column is of a general nature and should not be relied upon as a substitute for professional advice.

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AUSSI MASTERS SWIMMING



21st ANNIVERSARY

History Of NATIONAL RECORDS

Tailoring a Programme

A COACHING SEMINAR WITH ANITA KILLMIER

A transcript of this 2 day seminar conducted by AUSSI Tasmania is now available in booklet form to all members. Cost is \$5.00 which includes postage and all money goes directly to purchase more videos for the AUSSI Resource Centre.

The booklet is also available as a video to borrow from your branch or the Resource Centre and contents include;

- Elements of physical fitness
- Energy systems used in swimming and how to train these systems for specific events
- Pulse rate counting
- Goal Setting
- Devising a Seasonal Plan

PRINT OVER RUNS

Every issue I print more than the subscribed numbers of newsletters. When people re-subscribe late, they usually request to have sent the issue that they've missed.

If you have re-subscribed, requested an issue but not received it, it means I have run out of the over runs and will not be printing anymore. Your subscription will begin with the following issue.

To guarantee continuity of newsletters you must re-subscribe by the date on your envelope label.

ANNUAL SUBSCRIPTION

Your subscription renewal date is now printed on your envelope address label.

Failure to renew by this date will mean missing that month's issue.

"Athletes should put less emphasis on winning medals and more time on swimming to the best of their ability. If they do that the medals will follow."

Nicole Stevenson

Newsletter Snippets

From Swimmer's News - Queensland Masters Swimming

STATE RECORDS

A word of advice for all swimmers planning on breaking records this year. State records now require 3 times for them to be accepted. This is to bring us in line with National. It would be best if clubs holding carnivals could provide all lanes with 3 timekeepers, however if not possible, it is up to YOU the swimmer to request additional timekeepers.

**"State Records
now require 3
times for them to
be accepted."**

SWIM TIP

The velocity of a swimmer is equivalent to the product of the swimmer's stroke length and stroke frequency. An improvement in either, keeping the other constant, will increase swimming speed.

Stroke length is defined as the distance the body travels during one complete arm cycle. When working to improve either stroke length or stroke frequency, attention should be directed towards ensuring that any gain in one area is not at the expense of a loss in another.

Dr. Bruce Mason AIS

COACHING QUIPS

1. The genius of great swimmers isn't how fast they stroke, it's how far their bodies travel every time they take a stroke.
2. The second genius of great swimmers isn't how powerful their strokes are; it's how slippery they can make their bodies.
3. Fitness is something that happens to you while you practice proper stroke technique.

Author Terry Laughlin, Director of Total Immersion Swimming in N.Y., and author of many articles appearing in our newsletters, teaches the secrets of 'slippery swimming' at weekend workshops throughout the US.

A workshop is planned for Sydney 7-8 Dec 1996.

For details contact Di Coxon, NSW Branch Coaching Director. Ph (02) 652 1215.

From the National Newsletter

HISTORY OF NATIONAL RECORDS

AUSSI's 21st Anniversary "History of National Records" are available from the National Office for \$10.00 each (way under our cost), plus packaging and postage. For convenience, we will round that to \$3.50.

21ST ANNIVERSARY SERVICE AWARDS

At AUSSI's 21 Anniversary Dinner at North Ryde on Saturday 21 September 1996, it was announced that the following AUSSI Members have been chosen to receive a special award for having been of special service to AUSSI. All have contributed actively for the benefit of AUSSI for more than 10 years.

In alphabetical order they are:

| | |
|----------------------|-----------------------|
| John Barrett QLD | Margie Barrett QLD |
| Bell QLD | Hector Beveridge TAS |
| Glen Boorn WA | Perri Brereton TAS |
| Toni Cameron QLD | Dick Campion VIC |
| Bren Catchpole QLD | Margaret Clifford VIC |
| Tanya Colyer ACT | Claire Condon NT |
| Kay Cox WA | Di Coxon NSW |
| Judith Crawford WA | David Cummins WA |
| Joan Curtain NT | Joan Davies SA |
| Carol Dawson NSW | Dorothy Dickey VIC |
| Bob Dorrington NSW | Opal Eddy NSW |
| Peter Emery QLD | Elly Fleig SA |
| Judy Ford ACT | Ken Ford NSW |
| David Forsyth QLD | Norma Fowler SA |
| Max Gillespie QLD | Peter Gillette SA |
| David Gordon VIC | John Grosvenor SA |
| David Haley QLD | Daryl Hawkes SA |
| Malcolm Heath NSW | Kathy Heenan SA |
| Brian Hird NSW | June Hird NSW |
| David Hughes QLD | Peter Jackson NSW |
| Fred Johnson WA | Roger Johnston NSW |
| Sue Johnstone NSW | Mary Kemp SA |
| Anita Killmier VIC | John Kinnaid VIC |
| Alice Kinnaid VIC | Sid Krasey VIC |
| Gillian Laughton SA | Jennie Mack QLD |
| Elinor Mackenzie ACT | Shirley Malcolm VIC |

The Pre Race Warmup

Continued from page 4

Even the top swimmers seemed to underdo their warmups. At my club in the last two weeks before competition we discuss different ideas for pre race warmups and allow at least 2 sessions leading in to a meet where swimmers are given the opportunity to construct a warmup tailored to the individual, based on current level of fitness and the event. A half hour is then allocated in training for a pre race rehearsal and simulated race. The swimmer may then make further modifications to the warmup plan.

"The irony is that the older the swimmer, the longer it takes them to get going, yet the shorter they make their pre race warmup."

In general a swimmer who trains around 3 to 4 sessions per week should aim for anywhere between 800m to 1200m in their warmup. Distance swimmers may go even further. A good guideline is to swim one quarter to a third of the volume you regularly train at.

The warmup should include a variety of strokes to warm up all the different muscle groups, some drills to focus and fine tune technique, some moderate intensity repeats that give a 10 to 15 second rest to elevate the heart rate, some short sharp sprints at race pace (E.G. for a 50m race swim 2 to 4x25m sprints at 100%; for a 200m race swim 1-2x50m with a dive start in the time you want to swim the first lap of the 200m. This should roughly equate to 90 to 95% effort); some starts and turns to familiarise yourself with the pool, and a loosen up swim to finish off with. Some swimmers like to include pulling and kicking and stretching is probably one of the most overlooked but important components of the warmup.

I tell my swimmers to make a note in training of any warmup sets that I give them that they like. These can then be integrated into the pre race warmup routine. I also tell them to take note of how long it takes to start feeling good in each session. This will indicate how long the pre race warmup should take. Most swimmers regardless of age (except very unfit or drop dead sprinters) seem to free up and get their second wind in the middle of a fairly pacey set. The irony is that the older the swimmer, the longer it takes them to get going, yet the shorter they make their pre race

warmup.

There is merit in the argument that if you don't train, warming up is merely going to exhaust you before you race. Unfortunately there are many who race in an unfit state, thus putting themselves at great risk of coronary trouble. Coaches and clubs would do well to discourage these people from entering competitions.

In conclusion, if you want to race well the pre race warmup should not be an afterthought, but must be planned and practised in advance. It should be personalised to suit the individual and will vary according to the events entered and the fitness level of the swimmer.

by Anita Killmier

21st Anniversary Service Awards cont.

| | |
|---------------------------|--------------------------|
| Hank Markus QLD | John Marriott VIC |
| Bob McCabe VIC | Glenys McDonald WA |
| Vic McDonald WA | Philip McDougall VIC |
| Shirley McFarland VIC | George McGilvray NSW |
| Alwynne McMahon TAS | Jack McMahon NSW |
| Clyde McMillan VIC | Gordan Medcalf WA |
| Michael Meloncelli WA | Toni Morris WA |
| Vicki Murphy SA | Christine Parsons QLD |
| Mary Phin SA | Chris Potter SA |
| Sandra Pugh QLD | Claire Reaburn QLD |
| Peter Reaburn QLD | Bruce Ripper VIC |
| Janne Robertson NSW | Geoff Robinson QLD |
| Barbara Rose NSW | Helen Rubin NSW |
| David Ryan QLD | Barry Sales WA |
| Joe Savage SA | Kit Simons SA |
| Di Simons SA | Beryl Stenhouse NSW |
| Betty Stern NSW | Gary Stutsel OAM NSW |
| Mary Sweeney QLD | Robin Sweeney QLD |
| Doug Tantau VIC | Ken Theodore QLD |
| Geoff Upton WA | Barbara van der Leest WA |
| June Waite SA | |
| Florence Walker SA | Steve Walker ACT |
| Liz Wallace NSW | Cathy Watkins WA |
| Hans Wehrens VIC | Margaret Wilson NSW |
| Barbara Wilson-Brooks VIC | |
| Ivan Wingate SA | Les Worthington ACT |

NED is an AUSSI acronym for National Executive Director. Our NED is, of course, Ivan Wingate. AUSSI was an acronym which stood for Australian Senior Swimmers International. This has since been dropped and we are just known as AUSSL. Note there is no 'E' on the end of AUSSL. It supprises me how many Masters swimmers and even clubs still spell it incorrectly.

Measuring Performance - Part 2

By Anita Killmier

"Anything measurable should be measured"

Last issue I looked at some very simple measures a coach can apply in training to gauge efficiency and monitor intensity of swimmers. This issue I plan to look at some specific test sets used by myself to measure improvement over the course of a season.

Let me start out by saying that the sets I will talk about have evolved and been refined over a number

of years. As a full time coach they do require a fair amount of computer time to obtain results. Non-the-less, before obtaining a computer and gaining some basic computer literacy skills, I was able to perform most of the tests mentioned, working out the results manually.

GENERAL GUIDELINES

One word of caution however. Most of these sets are very stressful and could place swimmers at risk.

1. Novices and unfit or injured swimmers should be given lower heart rates than those specified here. Also start your squad with a smaller number of repeats and add more over a period of time. My squads took around 18 months to train up to doing the sets as specified here. Planned progression is the name of the game and coaches of Masters would always be wise to err on the side of caution.

2. If you plan to incorporate any of these sets into your own routines, my advise would be not to be too ambitious, but to choose one or two sets only and gain the experience in administrating them before adding others.

3. Use the same testing protocol every time you administer the same test. For results to be meaningful the test should be held on the same day of the week and at the same time of day. Swimmers should be given the same pre test warmup. Swimmers must also be aware of trying to set up the same conditions for each test. For instance if the swimmer has a heavy social night the night before one test, and is fresh and rested for the following test, the results will be biased.

4. Swimmers must be honest and start and

finish correctly. Due to the size of my squad swimmers read their time off the clock and are fairly accurate to the nearest .5. Where pool space allows they go at ten second intervals to minimize drag.

5. With limited manpower and monitors I am unable to take every swimmers heart rates every single repeat. I take as many as I can over the set which gives me a 'feel' for the intensity each swimmer is performing at.

32 x 50's HEART RATE SET

This set is a fairly popular set amongst coaches and I believe it is the best set to train for the 200m event. We do it once a fortnight on Saturday and swimmers record all 50m times and Heart Rates on laminated sheets. (Table 1). Results are pinned up at the pool and swimmers try to better their best ever result. (See Results Sheet 1)

Effectively the set is 8 broken 200m swims aiming for the net time to be at, or faster than, the swimmers PB. If they have set a goal 200m time, we divide that by 4 to get an average 50m target time to aim for. Swimmers aim to swim the entire set at a Heart Rate of 10BBM, though in reality it takes them about 8 x 50's to work up to this heart rate. On their last set swimmers aim for a maximum heart rate and go all out.

Time intervals vary according to ability. My top Masters do 60;60;60;1.30: my other lanes would respectively go 65;65;65;1.45; OR 1.15;1.15;1.15;1.45: OR 1.30;1.30;1.30;2.00. I aim to give 20 to 30 seconds rest per 50m with an extra 30 seconds between sets of 4 x 50's.

I work out net times for each 200m and then give an average net time. It is this average that is the meaningful result I am after. Over time I have found that the average is about what a swimmer will perform in a race. Improve the average and the PB 200m improves.

20 x 100'M HEART RATE SET.

This set is purportedly used by Keiren Perkins but I have found it advantageous for all swimmers irrespective of their specialty distance. The target time swimmers aim for is called their 'critical speed' (Vcr) and we determine it by using Bob Treffene's 5 x 200m Step Test.

"One word of caution however. Most of these sets are very stressful and could place swimmers at risk."

Table 1: This is a reduced version of my laminated recording sheets which I just drew up by hand. The sheet is A4 and is 'Landscape' in orientation.

[illegible]

Table 2:

RECORD SHEET

[illegible]

Results Sheet 1:

| | 30/7/96 | | | | 1 | | | | 2 | | | | 3 | | | | 4 | |
|-------------------|---------|------|------|------|------|---------|------|------|------|------|---------|------|------|------|------|---------|------|---------|
| Richard Walls | Time | 32 | 32 | 32.5 | 32 | 2:08.50 | 32 | 32.5 | 32 | 32 | 2:08.50 | 31.5 | 32 | 32.5 | 32 | 2:08.00 | 32.5 | 2:09.12 |
| | HR | | | | | | | | 170 | 185 | | | 176 | 180 | 181 | | 177 | 181 |
| | FLY | | | | 5 | | | | 6 | | | | 7 | | | | 8 | |
| | Time | 33 | 32.5 | 32 | 32.5 | 2:10.00 | 32 | 33 | 32.5 | 32 | 2:09.50 | 32 | 32.5 | 33 | 33 | 2:10.50 | 32 | 2:09.00 |
| | HR | | | 182 | 181 | | | 177 | 177 | 184 | | | 181 | 182 | | 193 | 190 | |
| 3/8/96 | | | | | 1 | | | | 2 | | | | 3 | | | | 4 | |
| | Time | 32 | 32 | 33 | 32 | 2:09.00 | 32 | 32 | 33 | 32 | 2:09.00 | 31 | 31 | 31 | 31 | 2:04.00 | 31 | 2:05.00 |
| | HR | | 154 | | 166 | | | | | 171 | | | | 183 | | | 184 | |
| | FLY | | | | 5 | | | | 6 | | | | 7 | | | | 8 | |
| | Time | 32 | 32 | 31 | 31 | 2:06.00 | 32 | 32 | 32 | 32 | 2:08.00 | 32 | 32 | 32 | 32 | 2:08.00 | 31 | 2:06.00 |
| | HR | | | | 179 | | | | | 184 | | | | 188 | | 188 | 187 | |
| 13/8/96 | | | | | 1 | | | | 2 | | | | 3 | | | | 4 | |
| Week 1 of 3 | Time | 31 | 32 | 31 | 32 | 2:06 | 31.3 | 31.8 | 32 | 31.9 | 2:07 | 31.5 | 32.7 | 32.2 | 32.5 | 2:08.9 | 32.2 | 2:09.75 |
| week taper. | HR | | 175 | | 177 | | 176 | 177 | | | | 177 | 179 | 178 | | | 184 | |
| Only did 24x 50s | FLY | | | | 5 | | | | 6 | | | | 7 | | | | 8 | |
| | Time | 32.6 | 33 | 33.6 | 33.5 | 2:12.7 | 32 | 34 | 34 | 33 | 2:13.0 | | | | | | | |
| | HR | | | | | | 182 | 189 | | 183 | | | | | | | | |
| | | | | | 1 | | | | 2 | | | | 3 | | | | 4 | |
| Week 3 of Taper | Time | 32 | 32 | 32 | 33 | 2:09.0 | 32 | 33 | 33 | 33 | 2:11.0 | 33 | 32 | 33 | 33 | 2:11.0 | | 2:10.33 |
| Only did 12 x 50s | HR | | | 176 | 173 | | | 179 | | 182 | | | | 184 | 186 | | | |
| 23/10/96 | | | | | 1 | | | | 2 | | | | 3 | | | | 4 | |
| | Time | 32 | 34 | 34 | 33 | 2:13.0 | 33 | 33 | 33 | 34 | 2:13.0 | 32 | 33 | 34 | 33 | 2:12.0 | 33 | 2:10.0 |
| | HR | | 171 | | 164 | | 168 | 167 | 171 | | | 172 | 176 | | 178 | 178 | 178 | 182 |
| | FLY | | | | 5 | | | | 6 | | | | 7 | | | | 8 | |
| | Time | 32 | 33 | 34 | 33 | 2:12 | 33 | 34 | 33 | 34 | 2:14 | 34 | 33 | 33 | 34 | 2:14 | 32 | 2:11 |
| | HR | | 182 | 183 | | | | 185 | 186 | 183 | | | | 182 | | 181 | 189 | 189 |
| 26/10/96 | | | | | 1 | | | | 2 | | | | 3 | | | | 4 | |
| | Time | 34 | 35 | 35 | 34 | 2:18 | 33 | 33 | 33 | 33 | 2:12.0 | 33 | 33 | 32.5 | 32 | 2:10.5 | 32 | 2:08.0 |
| | HR | | 153 | | | | 157 | 160 | | 162 | | | | | 168 | 173 | | |
| | FLY | | | | 5 | | | | 6 | | | | 7 | | | | 8 | |
| | Time | 32 | 32 | 32 | 33 | 2:09.0 | 32 | 32 | 32 | 32 | 2:08.0 | 32 | 32 | 32 | 32 | 2:08.0 | 31 | 2:04.0 |
| | HR | | | | | 174 | | 176 | 176 | | | | | | | 178 | 180 | 185 |
| 6/11/96 | | | | | 1 | | | | 2 | | | | 3 | | | | 4 | |
| | Time | 33 | 33 | 32 | 32 | 2:10.0 | 31.5 | 31.5 | 31 | 31 | 2:06.0 | 31 | 31 | 31 | 31 | 2:04.0 | 30.5 | 2:03.0 |
| | HR | | 158 | | | 164 | | 171 | | 172 | | | 180 | | | | 185 | |
| | Fly | | | | 5 | | | | 6 | | | | 7 | | | | 8 | |
| | Time | 30.5 | 31 | 30.5 | 30.5 | 2:02.5 | 30 | 30 | 30 | 30.5 | 2:00.5 | 30.5 | 30.5 | 31 | 31 | 2:03.0 | 30 | 2:00.0 |
| | HR | | 180 | 183 | | | | 192 | | 191 | | | 186 | | 187 | | 190 | 191 |

Results Sheet 2

| TEST SET AVERAGES | | | | | | | 0.00 |
|--------------------------|--------|----------|------------|-------|-------|-------|-------|
| Name | Stroke | Date | Trial No.1 | 2 | 3 | 4 | 2.25 |
| Amanda Fordyce | BRST | 15/3/96 | 18.02 | 17.83 | 18.12 | 17.89 | 17.97 |
| | BRST | 31/5/96 | 18.12 | 18.06 | 18.10 | 18.28 | 18.14 |
| | BRST | 21/6/96 | 17.64 | 17.46 | 17.90 | 17.73 | 17.68 |
| | BRST | 19/7/96 | 17.69 | 17.81 | 17.54 | 17.72 | 17.69 |
| | BRST | 26/7/96 | 17.50 | 17.72 | 17.51 | 17.49 | 17.56 |
| | BRST | 216/8/96 | 18.10 | 18.10 | 17.87 | 17.86 | 17.98 |
| | BRST | 23/8/96 | 17.92 | 17.87 | 17.93 | 17.88 | 17.90 |
| 3 days out of Opens | BRST | 28/8/96 | 17.46 | 17.46 | 17.48 | 17.71 | 17.53 |
| 3 days out of Age Champs | BRST | 4/9/96 | 17.49 | 17.42 | 17.29 | 17.50 | 17.43 |
| | F/S | 8/3/96 | 14.85 | 14.76 | 14.84 | 14.64 | 14.77 |
| | F/S | 28/6/96 | 14.13 | 14.05 | 14.19 | 13.98 | 14.09 |
| | F/S | 12/7/96 | 14.55 | 14.56 | 14.38 | 14.50 | 14.50 |
| | F/S | 2/8/96 | 14.31 | 14.20 | 14.20 | 14.28 | 14.25 |
| | FLY | 29/8/95 | 15.85 | 15.97 | 16.11 | 15.93 | 15.97 |
| | BK | 6/12/95 | 18.56 | 18.54 | 18.88 | 18.68 | 18.67 |

Bob has designed a formula that can be used to determine a 'safe' critical speed if you don't happen to have the software package to do it for you.

PB 200m $\div 2 = X$
 X minus PB 100m = Y
 X + Y = VCr

EG $2.12.0 \div 2 = 1.06.0$
 $1.06.0 - 1.02.0 = .04.0$
 $1.06 + .04 = 1.10.0$

In this example the swimmer would be expected to hold 1.10.0 throughout the entire set, having between 40 and 50 seconds rest per 100m.

I average out the set and use this for comparison.

5 x 200M STEP TEST

We aim to do this set once a month but it relies heavily on volunteers to help.

A step test is really any set that takes an athlete through the full heart rate range. It can help you determine a swimmer's maximum heart rate and with the correct software package, a more accurate critical speed.

Swimmers swim 5 x 200's on 6.00 each one faster than the one before. Swimmers must aim to evenly pace each 200m so times are taken at the 100m split to monitor pace. Heart rates and times are taken immediately upon completion of each 200m.

Heart rate ranges should be as follows;

1) 40-50bpm; 2) 30-40bpm; 3) 20-30bpm; 4) 10-20bpm; 5) max HR.

The software package and heart rate monitors are available from;

Dr Bob Treffene
 C/- Heart Rate Industries
 48 Goldieslie Rd.
 Indooroopilly QLD 4068

6 x 25M

During our Quality Phase of the season we do this set once a week generally on a Friday. All swimmers find this set fun as it affords plenty of time to socialise. Swimmers look forward to the end of the week because of this set and if they are racing on the weekend it sharpens them up without any residual fatigue.

Swimmers perform 6 x 25's of the same stroke, dive start and walkback on around 3 minutes. The fastest and slowest times are discarded and the middle four times are averaged. Swimmers love to see their average dropping as the season progresses (see Results sheet 2).

KICK SETS

Masters swimmers are generally very poor kickers and hate kick sets. To encourage them to want to improve I give them a timed 200m kick. Anyone who can break 3 minutes gets a free double pass to the movies. To date two swimmers have cashed in. (See Results sheet 3)

I only record PB's on this set, but it has had the desired result and kicking overall has noticeably improved.

We also record PB's on a set of 8 x 50's with around 15 - 20 seconds rest aiming for a variation of no more than 4 seconds between the first and last 50. (See Results sheet 4) These two sets are alternated weekly.

OTHER

We measure a variety of other skills such as timing dives over a set distance. Our marker fixed at 10 metres is a line that is painted on the bottom across the pool. The AIS measure over a 15 metres distance. When sprinting over 25 metres we will often get dive time; total 25m time, free swimming time (total minus dive), stroke rate and stroke count. We will analyse where the swimmer can improve and then go back and repeat the swim.

Turns can also be measured. Tumble turns are measured from a distance of 7.5m from the wall. The watch is started and stopped when the swimmer's head crosses the line. Touch turns are measured by the hand to foot speed on the turning motion itself. The watch is started when the hands touch the wall and stopped when the feet push off. (See Results Sheet 5 reprinted with permission from the 'Australian Swim Coach' Vol.XII No.5.)

RECORDING RESULTS

One of the biggest problems I used to face was recording the results of every swimmer with only myself on deck. I since have devised a number of

When there are too many statistics for me to record, the swimmers record their own results on a

Results Sheet 3:

Masters 200m Kick

| NAME | F/S DATE | TIME | BACK DATE | TIME | BREAST DATE | TIME | FLY DATE | TIME |
|--------------|-------------|---------|--------------|---------|----------------|---------|-------------|---------|
| ALDERSON | | | | | 21/6/96 | 4.08.00 | | |
| ALDRED | 14/2/96 | 4.19.00 | | | | | | |
| BANAY | 29/12/95 | 5.10.17 | | | | | | |
| BARROW J | 12/7/96 | 5.19.00 | | | | | | |
| BLOGG | 13/12/95 | 4.15.12 | | | | | | |
| BONESS | 15/11/95 | 3.19.01 | | | | | | |
| BORSCHMANN J | 24/5/96 | 4.47.00 | | | | | | |
| BRADFIELD | 15/11/95 | 5.47.45 | | | | | | |
| BUTLER | 12/7/96 | 3.18.60 | | | | | | |
| CHRISTIE | | | | | | | | |
| CIRILUS | 31/1/96 | 5.48.00 | | | 29/11/95 | 4.57.80 | | |
| COLLINS B | | 4.48.00 | | | | | | |
| CONDON | 13/12/95 | 4.23.49 | | | | | | |
| CROXALL R | 5/6/96 | 4.25.00 | | | | | | |
| DAVIES R | 24/5/96 | 2.53.00 | | | | | | |
| DENNET | 15/11/95 | 6.07.77 | | | | | | |
| DENTON | 14/8/95 | 4.49.01 | | | | | | |
| DONALDSON | | | | | 29/3/96 | 3.31.91 | | |
| FERRARO | 15/11/95 | 5.16.01 | 27-Mar | 4.49.03 | | | | |
| FIEGL A | 31/1/96 | 4.50.00 | | | | | | |
| FRANKLIN B | 12/7/96 | 6.35.44 | | | | | | |
| FRANKLIN T | | | | | | | | |
| GILBERT | 5.08.99 | | | | 14/8/95 | 3.47.09 | | |
| GILLETTE | | | | | 12/7/96 | 2.57.40 | | |
| GODDEN M | | | | | 14/2/96 | 5.04.00 | | |
| GOR-ADD | 29/3/96 | 6.19.20 | | | | | | |
| HALL | 21/6/96 | 4.37.00 | | | | | 15/11/95 | 5.00.00 |
| HARTL | | | | | | | | |
| HARDING J | 12/7/96 | 4.34.00 | | | | | | |
| HEALY | 13/3/96 | 4.48.00 | | | | | 29/3/96 | 4.51.00 |

Results Sheet 4:

8 x 50m Kick

| NAME | FLY DATE | FAST SLOW | BACK DATE | FAST SLOW | BRST DATE | FAST SLOW | FREE DATE | FAST SLOW |
|---------------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| ALDRED Naomi | | 42 53 | | | | | | |
| BAECK Jason | | | | | 25/10/96 | 48 52 | | |
| CHRISTISON Lee | | 45 50 | | | | | 17/1/96 | 55 62 |
| FETTERPLACE Jessica | | | | | 25/10/96 | 56 62 | | 50 58 |
| FORDYCE Amanda | | | | | 12/7/96 | 47 49 | | |
| FRANKLIN Laurent | | | | | | | 25/10/96 | 49 53 |
| HALLAMORE David | 12/7/96 | 55 58 | | | | | | |
| HARDING Kate | | | | | | | 25/10/96 | 51 55 |
| HARDING Sarah | | | | | | | | 44 46 |
| HARTL Anna | | | | 50 55 | | | | 50 52 |
| HARTL William | | | | | | | | 45 60 |
| HOFFMANN Emmett | | | | | | | 23/6/96 | 53 61 |
| HOFFMANN Jack | | | | 44 48 | | | 25/10/96 | 46 49 |
| KAN Angela | | | | | 23/6/96 | 44 47 | 25/10/96 | 45 46 |
| KAN Zoe | | | | | 25/10/96 | 53 59 | | |
| KEATING Charlotte | | | | | | | | 47 50 |
| KEATING Sarah | 25/10/96 | 49 53 | | | | | | 47 50 |
| KRONENBERG Ben | | | | | 12/7/96 | 53 57 | | 50 54 |
| MURPHY Katherine | | | | | | | | 49 51 |
| PICONE Claire | 25/10/96 | 52 55 | | | | | 16/2/96 | 54.7 1.04 |
| PROSSER Scott | 25/10/96 | 53 60 | | | | | 20/3/96 | 53 57 |
| SHIELD Candice | | | | | | | | 50 60 |
| SILVER Leon | | | | | 25/10/96 | 48 49 | | |
| WALLS Richard | | | | | | | 25/10/96 | 40 43 |
| WILKINSON Sally | | | | | | | | 53 56 |

Table 5:

Australian Institute of Sport Biomechanics Competition Analysis:
Men's 100m Freestyle Final 1996 Olympic Trials

| AUSTRALIAN NATIONALS-Olympic Trials | | | | | | | | | | Pg 1 of 1 | | | | | | | | | |
|-------------------------------------|-------------------|-------------------|-------------------|-------------------|--|-------------------|-------------------|--|--|---------------------------------|--|--|--|--|--|--|--|--|--|
| A Final 100m | | | | | SYDNEY AUSTRALIA Biomechanical OPEN Mens | | | | | April-1996 Analysis 23-APR-1996 | | | | | Australian Format A.I.S. BIOMECHANICS ANALYSIS FOR AUST. SWIMMING INC. | | | | |
| Chris FVDER | Michael KLIM | Ian VAN DER WAL | Scott LOGAN | Dwade SHEEHAN | Brett HAWKE | Richard UPTON | Darren LANGE | | | | | | | | | | | | |
| N.S.W. | Vic. | Old. | Old. | Old. | N.S.W. | N.S.W. | Old. | | | | | | | | | | | | |
| Lane # | Lane # | Lane # | Lane # | Lane # | Lane # | Lane # | Lane # | | | | | | | | | | | | |
| 6 | 5 | 4 | 3 | 2 | 1 | 1 | 1 | | | | | | | | | | | | |
| 25m Lap# | 25m Lap# | 25m Lap# | 25m Lap# | 25m Lap# | 25m Lap# | 25m Lap# | 25m Lap# | | | | | | | | | | | | |
| Start Time (s) | Start Time (s) | Start Time (s) | Start Time (s) | Start Time (s) | Start Time (s) | Start Time (s) | Start Time (s) | | | | | | | | | | | | |
| 6.08 | 6.18 | 6.1 | 6.12 | 6.2 | 6.12 | 6.12 | 6.1 | | | | | | | | | | | | |
| Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | | | | | | | | | | | | |
| 2.27 | 2.33 | 2.18 | 2.2 | 2.2 | 2.2 | 2.2 | 2.18 | | | | | | | | | | | | |
| Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | | | | | | | | | | | | |
| 52.9 | 49.5 | 53.1 | 54.5 | 54.5 | 54.5 | 54.5 | 52.9 | | | | | | | | | | | | |
| Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | | | | | | | | | | | | |
| 2 | 1.92 | 1.93 | 2 | 2 | 2 | 2 | 1.89 | | | | | | | | | | | | |
| Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | | | | | | | | | | | | |
| 4.54 | 4.47 | 4.21 | 4.4 | 4.4 | 4.4 | 4.4 | 4.13 | | | | | | | | | | | | |
| 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | | | | | | | | | | | | |
| 11.08 | 11.2 | 11.28 | 11.12 | 11.2 | 11.12 | 11.12 | 11.06 | | | | | | | | | | | | |
| 50m Lap# | 50m Lap# | 50m Lap# | 50m Lap# | 50m Lap# | 50m Lap# | 50m Lap# | 50m Lap# | | | | | | | | | | | | |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | | | | | |
| Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | | | | | | | | | | | | |
| 2.28 | 2.3 | 2.25 | 2.3 | 2.3 | 2.3 | 2.3 | 2.25 | | | | | | | | | | | | |
| Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | | | | | | | | | | | | |
| 50.2 | 49.7 | 50.5 | 49.2 | 49.2 | 49.2 | 49.2 | 49.3 | | | | | | | | | | | | |
| Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | | | | | | | | | | | | |
| 1.9 | 1.9 | 1.9 | 1.89 | 1.89 | 1.89 | 1.89 | 1.85 | | | | | | | | | | | | |
| Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | | | | | | | | | | | | |
| 4.34 | 4.37 | 4.28 | 4.35 | 4.35 | 4.35 | 4.35 | 4.16 | | | | | | | | | | | | |
| 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | | | | | | | | | | | | |
| 13.35 | 13.46 | 13.46 | 13.52 | 13.52 | 13.52 | 13.52 | 13.31 | | | | | | | | | | | | |
| Lap Time (s) | Lap Time (s) | Lap Time (s) | Lap Time (s) | Lap Time (s) | Lap Time (s) | Lap Time (s) | Lap Time (s) | | | | | | | | | | | | |
| 24.43 | 24.66 | 24.74 | 24.64 | 24.64 | 24.64 | 24.64 | 24.67 | | | | | | | | | | | | |
| 25m Lap# | 25m Lap# | 25m Lap# | 25m Lap# | 25m Lap# | 25m Lap# | 25m Lap# | 25m Lap# | | | | | | | | | | | | |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | |
| Turn Time (s) | Turn Time (s) | Turn Time (s) | Turn Time (s) | Turn Time (s) | Turn Time (s) | Turn Time (s) | Turn Time (s) | | | | | | | | | | | | |
| 7.36 | 7.52 | 7.32 | 7.5 | 7.48 | 7.5 | 7.5 | 7.46 | | | | | | | | | | | | |
| Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | | | | | | | | | | | | |
| 2.26 | 2.31 | 2.16 | 2.24 | 2.24 | 2.24 | 2.24 | 1.97 | | | | | | | | | | | | |
| Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | | | | | | | | | | | | |
| 50 | 49.5 | 51.4 | 50.3 | 50.3 | 50.3 | 50.3 | 57.3 | | | | | | | | | | | | |
| Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | | | | | | | | | | | | |
| 1.88 | 1.91 | 1.85 | 1.88 | 1.85 | 1.85 | 1.85 | 1.88 | | | | | | | | | | | | |
| Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | | | | | | | | | | | | |
| 4.26 | 4.41 | 3.98 | 4.22 | 3.52 | 3.52 | 3.52 | 3.7 | | | | | | | | | | | | |
| 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | | | | | | | | | | | | |
| 12.49 | 12.48 | 12.56 | 12.54 | 12.79 | 12.79 | 12.79 | 12.61 | | | | | | | | | | | | |
| 50m Lap# | 50m Lap# | 50m Lap# | 50m Lap# | 50m Lap# | 50m Lap# | 50m Lap# | 50m Lap# | | | | | | | | | | | | |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | |
| Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | Stroke Length (m) | | | | | | | | | | | | |
| 2.13 | 2.31 | 2.24 | 2.21 | 1.85 | 1.85 | 1.85 | 1.79 | | | | | | | | | | | | |
| Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | Stroke Freq (1/s) | | | | | | | | | | | | |
| 50.8 | 47 | 48.6 | 48.6 | 57.3 | 57.3 | 57.3 | 60 | | | | | | | | | | | | |
| Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | Velocity (m/s) | | | | | | | | | | | | |
| 1.81 | 1.81 | 1.81 | 1.79 | 1.77 | 1.77 | 1.77 | 1.79 | | | | | | | | | | | | |
| Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | Index (m/s) | | | | | | | | | | | | |
| 3.86 | 4.19 | 4.05 | 3.96 | 3.28 | 3.28 | 3.28 | 3.19 | | | | | | | | | | | | |
| 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | 25m Split (s) | | | | | | | | | | | | |
| 13.52 | 13.35 | 13.53 | 13.74 | 13.77 | 13.77 | 13.77 | 13.92 | | | | | | | | | | | | |
| Lap Time (s) | Lap Time (s) | Lap Time (s) | Lap Time (s) | Lap Time (s) | Lap Time (s) | Lap Time (s) | Lap Time (s) | | | | | | | | | | | | |
| 26.01 | 25.83 | 26.09 | 26.28 | 26.56 | 26.56 | 26.56 | 26.53 | | | | | | | | | | | | |
| Real Time (s) | Real Time (s) | Real Time (s) | Real Time (s) | Real Time (s) | Real Time (s) | Real Time (s) | Real Time (s) | | | | | | | | | | | | |
| 50.44 | 50.49 | 50.83 | 50.92 | 51.05 | 51.05 | 51.05 | 51.20 | | | | | | | | | | | | |
| Place | Place | Place | Place | Place | Place | Place | Place | | | | | | | | | | | | |
| 1st | 2nd | 3rd | 4th | 5th | 5th | 5th | 8th | | | | | | | | | | | | |
| Av Swim Velocity | Av Swim Velocity | Av Swim Velocity | Av Swim Velocity | Av Swim Velocity | Av Swim Velocity | Av Swim Velocity | Av Swim Velocity | | | | | | | | | | | | |
| 1.90 | 1.89 | 1.87 | 1.89 | 1.88 | 1.88 | 1.88 | 1.89 | | | | | | | | | | | | |
| Av Stroke Freq | Av Stroke Freq | Av Stroke Freq | Av Stroke Freq | Av Stroke Freq | Av Stroke Freq | Av Stroke Freq | Av Stroke Freq | | | | | | | | | | | | |
| 51.0 | 48.9 | 50.9 | 50.7 | 60.675 | 60.675 | 60.675 | 53.9 | | | | | | | | | | | | |
| Av Stroke Length | Av Stroke Length | Av Stroke Length | Av Stroke Length | Av Stroke Length | Av Stroke Length | Av Stroke Length | Av Stroke Length | | | | | | | | | | | | |
| 2.24 | 2.31 | 2.21 | 2.24 | 1.87 | 1.87 | 1.87 | 1.83 | | | | | | | | | | | | |
| Av Index | Av Index | Av Index | Av Index | Av Index | Av Index | Av Index | Av Index | | | | | | | | | | | | |
| 4.25 | 4.36 | 4.13 | 4.23 | 3.51 | 3.51 | 3.51 | 3.45 | | | | | | | | | | | | |
| Start Time (sec) | Start Time (sec) | Start Time (sec) | Start Time (sec) | Start Time (sec) | Start Time (sec) | Start Time (sec) | Start Time (sec) | | | | | | | | | | | | |
| 6.08 | 6.18 | 6.10 | 6.12 | 6.2 | 6.2 | 6.2 | 6.3 | | | | | | | | | | | | |
| Turn Time (sec) | Turn Time (sec) | Turn Time (sec) | Turn Time (sec) | Turn Time (sec) | Turn Time (sec) | Turn Time (sec) | Turn Time (sec) | | | | | | | | | | | | |
| 7.36 | 7.52 | 7.32 | 7.5 | 7.48 | 7.5 | 7.5 | 7.38 | | | | | | | | | | | | |
| Fin Time (sec) | Fin Time (sec) | Fin Time (sec) | Fin Time (sec) | Fin Time (sec) | Fin Time (sec) | Fin Time (sec) | Fin Time (sec) | | | | | | | | | | | | |
| 2.46 | 2.31 | 2.45 | 2.58 | 2.47 | 2.47 | 2.47 | 2.72 | | | | | | | | | | | | |
| Free Swim Time | Free Swim Time | Free Swim Time | Free Swim Time | Free Swim Time | Free Swim Time | Free Swim Time | Free Swim Time | | | | | | | | | | | | |
| 34.57 | 34.63 | 34.90 | 34.74 | 34.92 | 34.92 | 34.92 | 34.79 | | | | | | | | | | | | |
| Accounted Time | Accounted Time | Accounted Time | Accounted Time | Accounted Time | Accounted Time | Accounted Time | Accounted Time | | | | | | | | | | | | |
| 50.47 | 50.64 | 50.77 | 50.94 | 51.07 | 51.07 | 51.07 | 51.19 | | | | | | | | | | | | |

Measuring Performance - Part 2 (continued from previous page)

laminated sheet using chinagraph pencils. (See Table 1) This is an easy and inexpensive means that any coach on a limited budget can use. I put them at the end of the lane resting on kickboards. I may have 3-4 such sheets at the end of each lane.

Prior to starting the set swimmers are briefed on exactly what information they are to record and how to set it out, so that I can take the sheets back to the office later and transfer it all over to the computer. I have many spare sheets on hand as well as pencils, which sometimes break at precisely the wrong moment.

The sheets are waterproof and are nearly indestructible. They are easily wiped clean with a rag or tissue paper.

Using the computer I have drawn up a general 'Record Sheet' (Table 2) that is handy for recording a variety of tests.

GOAL SETTING AND RACE RESULTS

Although only my more serious competitive Masters commit goals to paper, my age groupers all go through the process with me every season. This goal setting sheet (Table 3) is easily modified to suit Masters. A similar sheet is also used to record important race results for easy comparison to goals. (See Table 4 which has been reprinted here in its entirety for you to copy and use as you like.)

The swimmer keeps one copy while I keep another. Based on the goal times and the splits calculated to achieve those goals we set training goal times for various tests.

RECORDING MILEAGE

With my age group swimmers I record mileage every session on an attendance sheet. I key this in monthly and it automatically totals the mileage on a weekly basis, as well as giving a cumulative total. (See Tables 5 and 6). This allows me to keep accurate account of each swimmer and helps me plan an individualised taper.

The only Masters I use this for are the ones who consistently train 4 or more sessions per week and compete.

Nothing is as motivating to a swimmer as doing a

Calendar of Events

1997

- Feb 3-6 New Zealand Masters Games PO Box 50 Wanganui Phone: (06) 345 4555 Fax: (06) 345 0015
- Mar 19-22 South African Masters LC Swimming Championships. Rustenburg, North West Province. Mandy McGregor, PO Box 661 Northland 2116 South Africa. Fax: (27-11) 787 8271
- Mar 27-29 AUSSI Masters LC Championships Sydney International Aquatic Centre, Homebush Bay PO Box 580 Cronulla NSW 2230. Fax: (61 2) 9544 1383
- April 11-13 New Zealand Masters National LC Championships. Stephen Clarke PO Box 6046 Dunedin North. Phone: NZ 473 8190.
- June 24-29 Pan Pacific Masters LC Championships. Lahaina Aquatic Centre, Maui. Hawaii Sports, 1155 Olowalu Way Honolulu, Hawaii. Fax: (1 808) 396 1623.

1998

- Date to be announced VIth World Masters Swimming Championships. Casablanca
- Aug 9-22 World Masters Games. Portland, Oregon.



If you want to advertise your meet in this space please send details to
AMSCN:
C/- 27 Johnstone St.,
Malvern VIC 3144
AUSTRALIA

Deadline Next issue February 1
1997

Table 3

Name: KATHERINE MURPHY

Goalsheet (Longcourse)

Date:

[illegible]

Continued next page.

POSITIONS VACANT
Powerpoints Masters Swimming Club Inc

Powerpoints Masters Swimming Club Inc. is seeking a coach to assist with its coaching program, commencing ASAP. The coaches duties would include:

- Retaining the Club's position as one of the pre-eminent competitive Clubs in Australia
- Possessing at least a Current Level 1 coaching qualification (with a view to obtaining a Level 1 masters qualification).
- Assisting in the general development of swimming ability and fitness of club members.
- Providing stroke correction advice to all members.
- Passing on knowledge to members of the AUSSI rules on strokes, starts, turns and finishes.
- Assisting in the selection of entry and relay teams at swim meets.

Applications / proposals are sought from qualified coaches who have a genuine interest in assisting the Club achieve the objectives and perform the duties set out above. Applications should include a statement of qualifications and experience, and an indication of availability and references.

**Enquiries please contact: The Secretary, Greg North, PO Box 175, Hawksburn, Victoria.
BH: 9268 3744. Mobile: 041 957 6268. Fax: 9268 3497**

Date:

[illegible]

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A Short History of the Development of Swimming Strokes

PART 1

With the Summer season now over, we move to a time of semi relaxation in terms of training intensity. No doubt most of you are still in the water doing light swimming and my experience of Masters swimmers is that they really never stop swimming. However because the intensity is relaxed, I thought I would devote the next two articles looking at some of the changes and developments made in the quest for greater speed. Also comparisons can be made between descriptions of strokes in the early development of swimming and the present time. These comparisons will also help you to understand the reasons why we do the things we do in swimming today. In this first article, I will deal with the development of Freestyle and Backstroke and in the second article we will look at Breaststroke and Butterfly. These last two strokes have probably undergone the most changes since the immediate post-war period

Freestyle

Shortly after he retired, the great Johnny Weissmuller wrote a book called "Swimming the American Crawl" in which he described his stroke and training methods. As this was the first book I purchased on the subject and because it was written by the greatest swimmer of all time up to that stage, it became my bible. Shortly after this I added another book to my swimming collection called The "Newest Swimming" by an English coach of the time, Gilbert Collins. The book was first published in 1937 and I bought a copy shortly after it appeared on the book shelves in this country. I was about 14 years old at the time. I still recall how I was amazed at how well it explained the various techniques in such great detail. Most of the stroke descriptions were derived from the author's observations at the 1936 Olympic Games in Berlin. Three years later Germany invaded Poland, an action

which triggered the start of the Second World War. Because of the war, the Olympics were not held again until 1948 in London. During this twelve year period, due to nearly all countries being involved in the war, little or no advancement in swimming took place. It was after 1948 that the real surge in the development of technique began. This was due largely to the fact that with the war years over, there seemed to be renewed interest in recreation and the advanced development of training and technique in all sports

Weissmuller in his book, described the stroke which was developed by his coach, William Bachrach, for him and the mistake many of us made at the time was to try and copy the techniques as described. I was one of those but what I failed to realise was that whereas Weissmuller was six foot five inches tall, I grew to about five foot seven if I stood up very straight. Also we failed to consider that we were trying to emulate an athlete endowed with quite exceptional talent. Collins describes in much more detail the strokes used by champions from all countries and explains the difference between the Americans, Europeans and also the Japanese who at that time were beginning to make an impact on world swimming. The interesting feature is that there were differences in the way swimmers from these parts of the world interpreted principles of technique at that time. The Japanese, with a much different technique from the Europeans and Americans, learned from people like Weissmuller but made adaptations to suit their particular physical characteristics. The most noticeable difference was in the way they employed the leg action with an emphasis on more knee bend with a six beat action used for all distances. To this day in fact the Japanese Freestylers with few exceptions tend to rely a great deal on their wonderful kicking ability.

Today, with the advanced science of fluid mechanics, there is a much better understanding of human movement and consequently over recent years considerable progress has been made in the technical development of all strokes. This development has been evident in Freestyle and Backstroke but more dramatically in Breaststroke and Butterfly.

Collins, in discussing the changes which occurred between 1932 and 1936 had this to say:

"Another recent departure from the Crabbe style is that whereas this swimmer employed a narrow hand entry, the present generation all enter the hand shoulder wide. The result is that they show less side to side rocking of the shoulders. These latter-day Americans, in fact, have largely eliminated roll from the stroke."

(Buster Crabbe was the winner of the 440 yards Freestyle at the 1932 Olympics in Los Angeles.)

Collins also goes on to say:

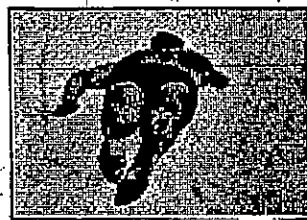
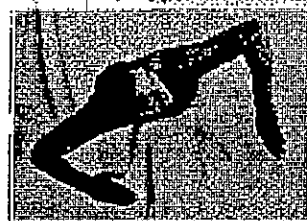
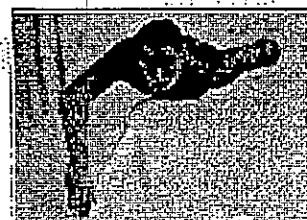
"The hand enters the water with a slight bend of the elbow downwards. As the hand is pulled back, the arm bends more so that the hand takes a fairly shallow course coming inward and passing more or less under the centre line of the body, then going out again to clear the hip comfortably. At this point

the arm relaxes completely and the typical American high elbow recovery begins."

In reading this description of the stroke we can see certain similarities to modern explanations of Freestyle technique with one important difference, the reference to an attempt to maintain a flat position with no body roll. In actual fact however these swimmers did employ a certain amount of body roll, far more than their coaches considered to be correct. The change in thinking with regards to body roll and shoulder rotation is comparatively recent and is the result of under-water studies of swimmers and work done in fluid mechanics laboratories in universities around the world. Now we are all aware of the importance of body roll along the long axis of the body to bring the shoulder over the stroke and to bring the latissimus muscles into play to provide power to the stroke.

The science of fluid mechanics also taught us the importance of pitching the hand and employing sculling movements which show in the inward and outward sweep of the hand in both Freestyle and Butterfly. The importance of bending the arm through the stroke is explained by Weissmuller in his book written in 1930 where he refers to it as a pull at the start of the stroke going over to a push on the second half of the stroke.

Continued on next page.



Johnny Weissmuller demonstrates the action of arms and feet in his crawl stroke. Note the flat position with little or no body roll.

Backstroke

So it can be seen that apart from the emphasis on maintaining a body position with very little shoulder roll, much of the way swimmers of the thirties swam was not too far away from what we do today. When it comes to Backstroke however there are very noticeable differences in the execution of the stroke. The best exponent of the stroke at the 1936 Olympics was the American, Adolf Keifer, whose technique was copied by anyone who wanted to be a good Backstroker. Up until the late nineteen fifties, the straight arm pull as used by Keifer remained as the ideal method. It was around the early nineteen sixties that swimmers began using a bent arm pull which probably came about by observing that Freestylers were using this method of stroke technique. The following is a brief description of the Keifer stroke.

"When the hand leaves the water at the thigh, it is carried over the water in a relatively flat swing of no more than 30 degrees to the horizontal. In the entry, no attempt was made to enter the hand directly behind the shoulder as we do today.

During the pull, the arm was held straight and swept straight around to the thigh and at the deepest part would be only about 35 degrees beneath the surface".

Consequently in this type of stroke there was very little shoulder rotation which also resulted in considerable lateral movement of the hips with some less flexible swimmers

In 1968 Dr. James Councilman wrote a book called *"The Science of Swimming"*. This book contained the first in-depth analyses of all strokes from a fluid mechanics standpoint. In the opening paragraph of his book Councilman says:

"Knowledge of the mechanics involved in swimming strokes must be based on certain mechanical principles which apply directly to swimming. Most incorrect ideas concerning stroke mechanics result either from misunderstanding and improper applications of these principles or from complete disregard or lack of knowledge of them."

This statement sets the tone for the whole manuscript and at the time changed the thinking of a lot of coaches. His analysis of Backstroke describes the stroke very much as it is done today. The two most obvious differences compared with the Keifer stroke were the high straight arm recovery and employing a body roll at the deepest part of the stroke of between 40 to 45 degrees. In the S pattern pull, the elbow is bent at approximately 90 degrees before it goes into the final phase of the stroke where it finishes with a straightening of the arm and a downward press which is synchronised with the entry of the other arm. This is briefly the way the stroke is described by Councilman and this has not changed very much up to the present day with the exception that today Backstrokers tend to press deeper at the start of the stroke than at the time of Councilman.

In part 2 of this article, I will discuss differences relating to the early days of Breaststroke and Butterfly as compared to the way they are swum today.

Pic Parkhouse



VALE

Otto Ford

22nd January 1926 - 6th September 1996.

Otto's interest in Water Polo and swimming in particular commenced as a child where he was very successful throughout Austria, Czechoslovakia and Hungary. Throughout his 20's Otto moved to Australia where he became involved with the Morwell Swimming Club as a swimmer and coach, producing many State and Country medallists. Otto was assistant manager of the Yallourn Swimming Pool for a period of 8 years, and manager of the Morwell Swimming Pool from 1966 to 1993. In the early 1980's Otto was one of the initiators in establishing a masters swim club which resulted in the birth of the Gippsland Flippers, which enjoys much success in the region today.

Our thoughts are with his wife - Margaret, his son - Brian, daughter in law - Michelle and grand children - Courtney, Brenton and Cameron.



Measuring Performance Part 2 continued from page16

Personal Best. The more we can measure and quantify performance whether it be in a race or in training, the greater the number of benchmarks are set, to be broken in future swims.

Of course all swimmers will have highs and lows, peaks and troughs in a season and over a lifetime. A plateau in one area may be offset by continued progress in another.

My swimmers are given copies at the end of every season of all their results, for future reference. Over the course of the season, year or even career they will be able to measure and monitor their progress. It also enables me to monitor training levels and intensities to see that swimmers don't overtrain.

It may seem as if I am a slave to the computer, but remember my skills are **very limited**. My husband has set up my programmes for me (bless him!) and I have a swimmer who is a computer buff who does help me out. Coaches may need to do a bit of networking if they are unable to do it all themselves.

Charting results graphically I believe will add an extra dimension to my recording. I haven't tried it yet but plan to as soon as I feel confident enough.

For Masters swimmers to remain in a sport potentially for a lifetime, coaches must find new and interesting ways to challenge and motivate their charges. This will also help keep the coach excited by their job.

The suggestions I have given you are by no means conclusive. Rather they should be a starting point for you to invent others.

Weekly Term 3 1996

Table 5

| NAME | TOTAL | 21/7 | 28/7 | 4/8 | 11/8 | 18/8 | 25/8 | 1/9 | 8/9 | 15/9 | 22/9 | 29/9 | 6/10 |
|---------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ALDRED Naomi | 146.05 | 13.75 | 19.00 | 11.70 | 15.60 | 8.30 | 20.15 | 13.85 | 9.90 | 0.00 | 18.60 | 15.20 | 0.00 |
| BAECK Jason | 112.10 | 8.50 | 10.90 | 11.50 | 14.60 | 12.20 | 14.90 | 11.00 | 10.40 | 8.50 | 0.00 | 9.60 | 4.90 |
| CHRISTISON Lee | 144.05 | 0.00 | 0.00 | 16.85 | 7.70 | 18.75 | 15.70 | 14.45 | 12.60 | 11.60 | 20.40 | 26.00 | 18.05 |
| FETTERPLACE Jessica | 113.55 | 9.00 | 10.80 | 9.70 | 16.15 | 0.00 | 15.05 | 9.05 | 10.50 | 4.50 | 13.90 | 14.90 | 0.00 |
| FORDYCE Amanda | 162.95 | 18.95 | 17.80 | 16.70 | 2.50 | 16.65 | 18.05 | 15.70 | 15.20 | 12.60 | 28.80 | 0.00 | 0.00 |
| FRANKLIN Laurent | 285.10 | 29.00 | 33.15 | 28.55 | 30.90 | 10.80 | 27.10 | 29.20 | 21.10 | 8.40 | 29.90 | 37.00 | 19.50 |
| HALLAMORE, David | 134.45 | 14.20 | 18.10 | 13.35 | 11.85 | 13.70 | 14.00 | 13.00 | 8.35 | 12.00 | 15.90 | 0.00 | 4.50 |
| HARDING Kate | 77.30 | 10.60 | 13.00 | 9.00 | 1.70 | 8.10 | 4.00 | 0.00 | 6.80 | 2.50 | 8.90 | 12.70 | 0.00 |
| HARDING Sarah | 175.10 | 23.70 | 23.15 | 25.90 | 13.40 | 25.00 | 19.65 | 11.00 | 15.90 | 1.00 | 13.40 | 3.00 | 31.00 |
| HARTL Anna | 125.10 | 11.40 | 9.70 | 14.30 | 6.90 | 18.00 | 12.20 | 18.70 | 14.30 | 0.00 | 3.50 | 16.10 | 0.00 |
| HARTL William | 109.00 | 11.20 | 9.80 | 18.20 | 9.40 | 14.30 | 4.00 | 12.85 | 7.60 | 0.00 | 3.80 | 17.85 | 0.00 |
| HOFFMANN Emmett | 129.30 | 15.90 | 21.10 | 13.10 | 19.75 | 24.90 | 4.00 | 17.95 | 12.60 | 0.00 | 0.00 | 0.00 | 10.10 |
| HOFFMANN Jack | 280.25 | 28.10 | 32.75 | 23.80 | 29.60 | 23.60 | 28.00 | 25.10 | 17.80 | 3.90 | 30.60 | 37.00 | 40.30 |
| KAN Angela | 150.65 | 0.00 | 16.85 | 19.00 | 12.00 | 19.30 | 19.60 | 19.50 | 13.00 | 10.20 | 3.60 | 17.60 | 23.80 |
| KAN Zoe | 65.50 | 0.00 | 4.80 | 10.80 | 6.00 | 4.30 | 4.20 | 4.30 | 7.50 | 6.80 | 0.00 | 16.80 | 13.55 |
| KEATING Charlotte | 80.60 | 3.40 | 3.75 | 4.10 | 7.40 | 0.00 | 7.45 | 5.70 | 10.10 | 14.70 | 21.60 | 2.40 | 24.50 |
| KEATING Sarah | 98.40 | 8.70 | 3.75 | 4.10 | 14.10 | 0.00 | 15.35 | 6.90 | 4.60 | 15.00 | 21.50 | 2.40 | 24.30 |
| KRONENBERG Ben | 126.95 | 13.20 | 14.25 | 11.45 | 14.30 | 7.40 | 14.90 | 11.60 | 9.60 | 8.45 | 12.50 | 9.30 | 23.55 |
| MURPHY Katherine | 244.00 | 16.90 | 27.00 | 21.20 | 20.60 | 20.40 | 27.40 | 26.60 | 18.30 | 9.10 | 18.50 | 38.00 | 35.90 |
| MURPHY James | 134.80 | 12.80 | 12.50 | 14.10 | 14.80 | 10.20 | 14.10 | 11.90 | 9.60 | 18.40 | 11.10 | 5.30 | 8.60 |
| PICONE Claire | 97.60 | 7.60 | 12.90 | 15.60 | 12.80 | 15.70 | 12.00 | 10.50 | 10.50 | 0.00 | 0.00 | 0.00 | 0.00 |
| PROSSER Scott | 173.85 | 19.20 | 21.20 | 19.75 | 18.90 | 20.60 | 21.30 | 18.00 | 20.00 | 4.10 | 0.00 | 10.80 | 0.00 |
| SILVER Leon | 131.40 | 7.80 | 16.30 | 15.50 | 19.40 | 14.60 | 3.60 | 9.00 | 13.30 | 17.10 | 14.80 | 0.00 | 0.00 |
| WALLS Richard | 397.95 | 45.40 | 40.00 | 50.00 | 50.50 | 36.30 | 28.70 | 26.00 | 10.80 | 26.95 | 38.00 | 45.30 | 48.80 |
| WILKINSON Sally | 180.30 | 29.80 | 27.40 | 28.80 | 14.10 | 18.70 | 17.40 | 4.00 | 20.40 | 19.60 | 0.00 | 0.00 | 13.50 |

1996 Totals

Table 6

| NAME | TOTAL | TOTAL T1 | TOTAL T2 | TOTAL T3 | TOTAL T4 |
|---------------------|---------|----------|----------|----------|----------|
| ALDRED Naomi | 548.08 | 139.60 | 206.73 | 146.05 | 55.70 |
| BAECK Jason | 353.65 | 98.95 | 77.10 | 112.10 | 65.50 |
| CHRISTISON Lee | 534.90 | 155.63 | 172.13 | 144.05 | 63.10 |
| CURTAIN Jessica | 45.55 | | | | 45.55 |
| FETTERPLACE Jessica | 415.98 | 124.88 | 121.35 | 113.55 | 56.20 |
| FORDYCE Amanda | 539.45 | 150.60 | 156.60 | 162.95 | 69.30 |
| FRANKLIN Laurent | 905.53 | 255.40 | 277.88 | 285.10 | 87.15 |
| HALLAMORE, David | 406.15 | 67.70 | 162.90 | 134.45 | 41.10 |
| HARDING Kate | 183.43 | 91.43 | | 77.30 | 14.70 |
| HARDING Sarah | 526.60 | 134.10 | 176.20 | 175.10 | 41.20 |
| HARTL Anna | 460.55 | 112.90 | 161.05 | 125.10 | 61.50 |
| HARTL William | 266.78 | 59.50 | 75.88 | 109.00 | 28.40 |
| HOFFMANN Emmett | 492.68 | 129.93 | 177.45 | 129.30 | 56.00 |
| HOFFMANN Jack | 871.78 | 214.75 | 275.18 | 280.25 | 101.60 |
| KAN Angela | 485.45 | 162.50 | 135.60 | 150.65 | 36.70 |
| KAN Zoe | 234.55 | 87.15 | 53.20 | 65.50 | 28.70 |
| KEATING Charlotte | 223.60 | 70.60 | | 80.60 | 72.40 |
| KEATING Sarah | 247.60 | 88.50 | | 95.40 | 68.70 |
| KRONENBERG Ben | 378.38 | 71.85 | 134.68 | 126.95 | 44.90 |
| MURPHY Katherine | 752.38 | 189.45 | 236.23 | 224.00 | 82.70 |
| MURPHY James | 180.50 | | | 134.80 | 45.70 |
| PICONE Claire | 237.60 | 87.60 | | 97.60 | 52.40 |
| PROSSER Scott | 537.25 | 141.93 | 149.38 | 173.85 | 72.10 |
| SILVER Leon | 367.85 | 94.90 | 107.55 | 131.40 | 34.00 |
| WALLS Richard | 1437.65 | 408.00 | 479.80 | 397.95 | 150.90 |
| WILKINSON Belinda | 45.75 | | | | 45.75 |
| WILKINSON Sally | 568.30 | 77.80 | 250.10 | 180.30 | 60.10 |

"Being defeated is often a temporary condition - giving up is what makes it permanent."

The following workouts are continued from our February issue. They are from an article called "Sept - June Swim Workouts" by Jamie Connors.
INTERMEDIATE

| NOVEMBER | |
|---|---|
| Monday | Wednesday |
| 10x75 alternate fr./str. :20 1-6 medium 7-12 hard | 6x100 4 free :10 4 choice |
| 4x200 free ↓ 1-2 4:40 | 8x125 1-3 75 building/50 fast 2:45 4-6 125 fast 7-8 choice |
| 16x25 choice ez/mod/hard :40 | 8x50 free/stroke 1:10 |
| Total 1950 | Total 2000 |
| Friday | Monday |
| 4x150 75 ez :30 75 hard | 3x150 75 br :20 50 bk :15 25 fly :55 |
| 12x75 (3 sets of 4) 1) stroke 2:00 2) free 1:45 3) stroke 2:00 4) free 1:45 | 16x50 (4 sets of 4)- 1st & 3rd - steady pace 1:15 2nd & 4th - ↓ 1-4 1:15 |
| 8x50 odd- 25 hard kick/25 ez swim 1:15 even- swim/kick 50 ez | 4x150 choice :30 building by 50's |
| Total 1950 | Total 1850 |
| Wednesday | Friday |
| 4x150 build by 50's :20 | 12x50 1-6 25 drill/25 swim :10 7-12 swim |
| 8x100 (2 sets of 4) 1. 50 ez/50 hard 2. steady all free 3. 50 ez/50 hard 4. steady | 8x125 (1-3) 75 build + 50 fast :40 (4-6) 50 " + 75 fast (7-8) 25 " + 100 fast |
| 6x75 25 drill/50 swim :20 3-free/ 3-choice | 4x100 50 ez/50 hard :30 |
| Total 1850 | Total 2000 |

GREAT NEWS! Queensland Branch reports that a new "milestone has been reached. They have cracked the 2000 member mark. Membership is currently at 2014, with 2 months to go. Next stop 3000 members and 100 clubs.

CONGRATULATIONS.

INTERMEDIATE

NOVEMBER

| Monday | | Wednesday | |
|------------|--|-----------------|---|
| 8x75 | 25 drill/50 swim :20 1-5 str. - 6-10 free | 6x100 | 3 free drill :20 3 free |
| 2x | (2x100 smooth free) 2:20 | 9x75 | (3 sets of 3) free 1:45 1) 25 ez/mod/hard 2) 25 mod/50 hard 3) 75 hard |
| 2x | (4x50 fast free) 1:15 | | |
| 4x75 | hypoxic breath every 2,3,4,5th stroke 1:45 | 5x50 | 25 drill/25 swim :15 150 cool-down |
| Total 1700 | | Total 1675 | |
| Friday | | Monday | |
| 3x300 | 1- free (mod) :30 2,3- free (hard) | 12x50 | 1-8 choice :10 9-12 free |
| 4x (4x50) | 1. free :15 2. 25 fr/25 str. :15 3. free :15 4. free :15 (extra 1 min between sets - take heart rate) -----50 ez | 3x (3x100) free | 1. ↓ 1-4 2:20 2. steady 3. ↓ 1-4 :30 between each set ----50 ez |
| 3x75 | 25 drill/50 swim :15 -----25 ez | 3x150 | 1 & 2 alternate 25 IM order/25 free :15 3. choice |
| Total 2000 | | Total 2000 | |
| Wednesday | | Friday | |
| 7x100 | free ez/hard :30 | 3x150 | 1 ez/2 mod/3 hard |
| 6x150 | build by 50's 1:45 | 16x50 | 1-4 & 9-12 free 1:15 5-8 & 13-16 25 fr/25 str 1:25 |
| 4x75 | stroke :15 | 4x100 | 1-3 build by 25's 2:20 4-6 fast |
| | | 10x25 | alt. ez/hard |
| Total 1900 | | Total 1900 | |

"One of the complexities of life regarding women: They can pour hot wax all over their legs, pull their hair out by the roots and still be afraid of spiders." -Seinfeld

Old Chinese Proverb: "Person who say it cannot be done should not interrupt the person doing it"

No Kidding Around Going Stroke-For-Stroke With Young Swimmers

By Marvin Schwartz

The 12-year-old boy walked over from the next lane and stood before me, the top of his head reaching to just below my chin. He looked up at me with the meanest sneer he could muster.

"Marvin," he said, poking a finger in my chest, "you're going down today."

We raced a 200 free that morning, and when it was over, my young teammate had come close but had not been able to beat me. Yet I knew it was just a matter of days, that he would soon drop seconds from his time while I struggled to hold steady. And later that summer, he did just that. He had his rite of passage, and I began, once again, the search for a new rabbit from the promising age-group swimmers on our team.

As a Masters swimmer training and competing with a strong age-group team, I am used to the exhilaration and the humiliation of racing kids young enough to be my grandchildren. Though not for all, the experience has its clear advantages. Being part of a team and having a coach who runs daily structured workouts compensate for living in an area where there are no Masters teams that train on my desired level. Also, there are not enough Masters meets to provide the racing opportunities I need.

Our coach, Paul Blair of the Arkansas Dolphins Little Rock Racquet Club Swim Team, tells us that to swim fast we need repeated opportunities to race. So each year I renew my United States Swimming membership and continue the curious phenomenon of age-group training for Masters swimmers.

Technical Benefits

Constant exposure to new and effective techniques is the primary benefit of swimming with a USS club. Like other Masters swimmers, I have read articles on stroke mechanics and body position in *SWIM*. But when I got in the water, the



Mixed Age Groups: Masters swimmers (standing in water from left) Keith Dixon, Trip Strauss, and Marvin Schwartz with some of their young teammates and Coach Paul Blair of the Little Rock Racquet Club Swim Team.

same old habits emerged and the same mistakes were repeated.

Today, I find the best way to learn the right tuck of a flip turn or the streamlined pushoff technique is simply to take an underwater view of my 16-year-old teammates as they come shooting off of the wall with their arms fully extended, their hips rolling, and their legs whipping out a dolphin kick that propels them nearly half the pool length. And, I've replaced my old flat-footed arm-swing start with the more efficient track position on the blocks by carefully watching how my young associates do it.

Swimming with age-groupers, I've also learned how to structure workouts across a complete season. Blair's training focuses on peak performance at the end-of-season championship meet, which follows a progression over several months through aerobic, endurance, pace and speed work. Age-group swimmers on the Dolphin Team repeat these cycles two or three times every year. They target key meets and build their training schedules around them. Masters competitive seasons peak at short and long course nationals, which usually follow soon after a Junior or Senior National championship meet. With our

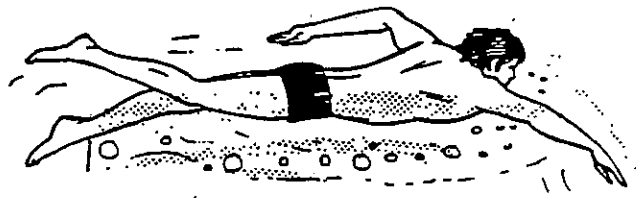
training patterns so well matched, it's easy to adapt a Masters swimmer's training needs to the age-group team cycles.

Age-group training offers a serious challenge, however. Training twice a day at up to 8,000 meters/yards per workout is not feasible for a person who must work for a living. But even free of job responsibilities, the intensity of age-group training and racing imposes a high degree of rest time. Older swimmers need longer recuperation time following peak exertion. This is most obvious at age-group meets where four or five races per half-day session are the norm for each swimmer. As much as we'd like to, few Masters swimmers can perform on that level.

Extreme Enthusiasm

The enthusiasm of training with a young team tends to push one to extremes. The result is a tendency to overtrain, particularly during mid-season cycles when high-yardage workouts are most common. The result can be a residual fatigue that lingers through the season until the championship taper begins.

The lesson to be learned is to view mid-season competition as part of the training program. Age-group training



No Kidding Around (continued from previous page)

teaches that the race experience is more important than the race itself and that the real challenge will come at the season championships. This is tough to accept when the young swimmers are dropping times at each meet.

Many Masters swimmers may view their time in the water as a chance to get away from their kids. Yet the teenagers on my team are the best I've ever met. I might feel that way only because I don't have to live with them. But there's no denying that a genuine camaraderie and a sense of team spirit develop. I'm glad when they drop times and go fast, but I want to go fast, too. I don't think I'll drop eight or ten seconds each season, though.

So, humility becomes a clear survival factor. It's a lesson I learned when a coach once approached me after a race and thanked me profusely for beating his star swimmer who had just loafed through a 100-meter butterfly. Said the coach, "I told him 'You're 17 and you've just been beaten by a 45-year-old man. How does that make you feel?' " The coach didn't ask how it made *me* feel to hear his logic, but he had a team to motivate and I was convenient for doing so at that moment.

These moments are compensated for by the encouragement and admiration Masters swimmers can receive at age-group meets. Swim parents gaze with envy, and officials cheer and offer encouragement. The "old man" is the crowd's sentimental favorite. But this status carries with it a high performance burden. Age-group swim meets and age-group training are high intensity physical challenges. The parents might be impressed, but to their fast kids, I'm just another body to be passed on the way to the finish line.

A father once approached me at a swim meet and asked my lane assignment for an upcoming heat. "My son is in the lane next to you," the guy said. "Kick his butt." I wanted to tell the man that I viewed his son as a fellow competitor and that I had nothing but admiration for the boy. The truth was clearly shown in the heat sheets, however. The boy's entry time was far ahead of mine. And the race quickly confirmed how unable I was to kick his butt or anyone else's in that age group. It's tough being a role model these days.

I once joined the George Washington University swim team for a workout, coached by my old Syracuse University

teammate and great Masters swimmer John Flannigan. I emerged from the 7,200-yard workout with numerous scrapes on my legs and sides, having been repeatedly swept into the lane ropes as 20-year-old bodies charged past me. Moments such as these quickly reinforce the reality that it is not easy to keep up.

A Sense of Humor

Age-group training must be approached with a sense of humor. When a kick set gets beyond my range, I put on my fins and laugh when the kids cry "no fair." When a repeat set leaves me hugging the wall for breath, I try skipping every other interval and finishing the set at an aerobic level, then just grin as the young bodies that slide past rant and rave.

A good age-group coach will recognize a Masters' contribution to the team. Just as swimmers can set a good example for their younger peers, so a Masters swimmer's presence can add stability and focus to a team workout. Sometimes, kids can get absolutely goofy in practice. A Masters swimmer can help a group keep on time and on count through a long set. On the other hand, a bunch of giggly kids can reveal the lighter side of a rigorous workout.

Masters swimming teaches us that we can never be too old to compete or enjoy this vital activity. Age-group training is a way to do this in high spirits. Blair constantly reminds his swimmers to set personal goals, and in turn I am reminded of what my goals as a Masters swimmer should be. Achieving them, however, does not always coincide with the desires of my young teammates. My 12-year-old son, for example, is a member of the Dolphins Team, and we work out and travel to meets together. It's a pleasure to be a part of his growth and to watch him overcome new challenges. I'm just not looking forward to the day when I hear him express his goals in those prophetic words, "Dad, you're going down today!"

When competing in his own age group, Marvin Schwartz, 47, swims for the Arkansas Masters Swim Club. He works as a grants writer for the Little Rock School District.

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NEW VIDEO FOR THE AUSSI RESOURCE CENTRE SWIMMING FASTEST A video and book combination

Over 2 hours of comprehensive video instruction featuring Olympic Gold Medallist Melvin Stewart and many other Olympians. The video is complimented by the clear step-by-step stroke analysis and illustrations provided in the book, making this the first ever swimming book and video combination on the market.

This kit features all strokes, starts, turns and finishes which are broken into a progression of learning drills that are geared toward age group, school and masters swimmers.

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"Never let your best so far be the standard for the rest of your life." Keiren Perkins

FITNESS

The ABC's of Energy Systems

By Judy Bonning

The following Article is reprinted with permission from 'Swim' September/ October 1996

Step into any local swimming facility and chances are you will notice adult swimmers grinding out laps, one after another, at the same speed. Devising an effective training plan with adequate variety is often mentally challenging, and putting the plan into practice is more physically challenging than, say, a comfortable 30-minute swim. Surely, lap swimming is healthier than doing no form of exercise, but to obtain maximum health and fitness benefits, swimmers must work at various speeds, intensities and durations.

Experienced swimmers are well aware of the differences in energy required to swim shorter and longer events. The sprinter who specializes in 50-yard events is more concerned with short bursts of speed, whereas the distance ace practices pacing and the optimum use of oxygen. In between, the "middle-distance" swimmer who favors 200-yard events must be concerned with both sprint speed and the use of oxygen. In other words, from the sprints to the distance events, various energy systems are being used to furnish power and endurance to the race's end.

While volumes of information have been published about energy systems, many researchers agree that there are three basic systems:

AEROBIC—with oxygen

ANAEROBIC—without oxygen

ANAEROBIC ALACTIC—without oxygen and without lactic acid (thus a-lactic)

We all know that oxygen, which is essential to life, is a gas that comprises 21 percent of the Earth's atmosphere. But, what exactly is lactic acid? Simply put, lactic acid is produced in the muscles when energy is expended. At rest, the body's lactic acid level is measured as one millimole per liter of blood. When the

| MAIN ENERGY SYSTEMS | | | |
|---------------------|------------------------------|---|---|
| ENERGY SYSTEM | DURATION OF ENERGY DELIVERED | ADVANTAGES | DISADVANTAGES |
| ANAEROBIC ALACTIC | 5-8 Seconds | <ul style="list-style-type: none"> • Delivers immediately • Large amount per unit of time • Recuperates fast | <ul style="list-style-type: none"> • Small container → empty after 7-10 seconds of maximum work |
| ANAEROBIC | 45-50 Seconds | <ul style="list-style-type: none"> • Delivers fast • Large amount per unit of time | <ul style="list-style-type: none"> • Small container → empty after ≈ 50 seconds of maximum work • End product lactic acid → Pain → Work ends when level intolerable • Recuperates slowly |
| AEROBIC | ≈ 60 seconds | <ul style="list-style-type: none"> • Large total amount of energy—delivers for a long period of time • Recuperates anaerobic alactic and anaerobic energy systems | <ul style="list-style-type: none"> • 8 seconds before reaction • 60 seconds before it works 100% |
| | Several hours or Longer | | |

intensity of exercise is increased the level of lactic acid in the blood increases, thereby decreasing the muscles' ability to function. A swimmer will feel a burning sensation in particular areas of the body when the level of lactic acid rises significantly.

Races that are 200 yards or meters in length are usually the most difficult because the distance is not long enough to move into a comfortable aerobic state and not short enough to swim easily without oxygen (as in 50-yard/meter events). The highest levels of lactic acid are generally achieved in competitions (approximately 13 to 21 mmol), but high levels (8 to 15 mmol) can also be produced during intense training sessions.

Three Main Energy Systems

Aerobic—The aerobic energy system, a longer-lasting quantity of energy, takes about eight seconds to initiate and about one minute before it works at 100 percent efficiency. This system can work for several hours or more, but the muscles must be continually replenished with glycogen for an athlete to continue at a steady pace.

Typically, marathon runners "bonk" or "hit the wall" after about two hours of running, approximately the amount of time it takes to deplete glycogen stores in the muscles. However, by using energy replacement drinks, endurance athletes have been able to extend their aerobic efforts significantly.

Kieren Perkins of Australia, world-record holder in the 400-, 800- and 1500-meter freestyles, has been known to swim 15 x 100-meter repeats, each under one minute, resting only a few seconds after each 100. Perkins can maintain such a pace without going into oxygen debt, that is, by staying "aerobic" through the entire set. Mind you, most swimmers would be going "anaerobic" after holding this pace for only a 50! Training is an individual matter, and while a specific pace for one swimmer may be aerobic, for another swimmer it may be anaerobic.

Actually, there are two levels of aerobic swimming. On the first level, the heart rate is relatively low (110 to 150 beats per minute, depending on age, conditioning, etc.) and the speed is low to

FITNESS The ABC's of Energy Systems (continued from previous page)

medium. This level is used in warming up, easy pull or swim sets, and warming down.

The higher aerobic level is characterized by a higher heart rate (110 to 180 bpm) at a medium-to-high speed. The individual is still able to maintain a steady aerobic state, or can talk fairly comfortably after completing the swim. High-aerobic swims should be challenging, but feasible. Swimmers may move into an anaerobic state near the completion of a high-aerobic level swim.



Even Kieren Perkins stops for a pick-me-up

Anaerobic—Training the anaerobic system can be quite difficult and is often neglected by many swimmers. In its purest sense, the anaerobic energy system is used for swimming at very fast speeds. The duration of this system (the breakdown of glycogen) is roughly 45 to 50 seconds, or the time of a very fast 100 freestyle.

The anaerobic system delivers quickly, and a large amount of energy per unit of time is expended. However the swimmer quickly begins to experience the end product of lactic acid—pain—and the effort will end when the level of lactic acid is intolerable. This energy system recuperates slowly after very fast anaerobic efforts and can be more quickly recharged with easy-to-moderate swimming, which helps to remove lactic acid.

At one time or another, all competitive swimmers have felt the burning sensation in their muscles or the proverbial "piano" drop on their backs due to the accumulation of lactic acid in the muscles. Coaches commonly hear from breathless swimmers that they "went out too fast" in middle distance races. Therefore, in events 100 yards or longer, pacing, or wisely using the anaerobic energy system, becomes a critical factor.

Researchers are still unsure whether training conditions the body to produce less lactic acid at maximum efforts or whether the body "learns" to clear it out of the muscles faster and more efficiently. Whatever the case, the body adapts and

becomes more efficient when the anaerobic system is tested on a regular basis.

Anaerobic Alactic—This energy system is "short and sweet." In the anaerobic alactic system, a minimal amount of lactic acid is produced because the duration of energy expended is only five to eight seconds. This system delivers immediately in large amounts of energy per unit of time. Likewise, it is replenished quickly.

When running quickly up a short flight of stairs, the primary energy system used is anaerobic alactic. For most people, running up stairs for more than eight seconds will produce a burning sensation in the legs and a shortness of breath. This is an indication that the anaerobic alactic system has been depleted. After a brief rest period, the body should be ready for another quick climbing spurt (or maybe the elevator!).

Obviously, sprinters will benefit greatly from training this system. To train "anaerobic alactic," swim several 10- to 15-meter sprints at an all-out pace. Recovery is quick, and it's fun and easy to go fast! For swimmers with a sluggish turnover, these sprints can contribute to developing hand speed. Distance swimmers and triathletes will want to train this system to help them take out races quickly, particularly at the beginning of crowded triathlons and open water races.

It is important to train each energy system specifically. For years, many coaches were training swimmers in the grey area

between the two energy systems, so neither system improved substantially. Moving into an anaerobic state early in a distance set by trying to keep up with the swimmer in the next lane is pointless. Know your limits and swim accordingly. Though some swimming will fall in the grey areas, determine the specific purpose of a particular training set and swim at your proper pace.

In a follow-up article, suggestions will be made for devising a training plan using the various energy systems. Whether working out twice a week or daily, all swimmers can benefit from including both aerobic and anaerobic forms of training in their routines.

Judy Bonning, current president of the Masters Aquatic Coaches Association and 1991 USMS Coach of the Year, is head coach of the Coral Springs Masters in Coral Springs, Fla. She earned a Masters degree in exercise physiology from the University of Alabama and has coached Masters for 18 years.



Only a fool tests the depth of the water with both feet.

Reprinted with permission from Masterscrawl September 1996



A Short History of the Development of Swimming Strokes

PART 2

Breaststroke

Perhaps the most interesting study of the development of swimming strokes is in breaststroke and butterfly. In looking at breaststroke it seems that butterfly must be discussed at the same time as the latter stroke was a development from breaststroke. Breaststroke is the oldest competitive stroke even though it was preceded by some other tiring and inefficient methods of swimming. The stroke was developed out of a need to keep afloat in rough water with the head above the surface. In 1690 a Frenchman, Melchisedech Thevenot wrote the following: "To swim with the head towards Heaven - to look upwards, and if we knew how to use it there would not be as many drowned as there daily are, for that happens because they look downwards and embrace the water as it were with their arms."

At the beginning of the sixteenth century the first mention was found of what must be the birth of breaststroke. In this style the simultaneous action of the arms appeared but with an alternate backward kicking movement from the knee. During the eighteenth century, breaststroke became known as the frog stroke which indicates that there was a spread of the legs with both moving back together once with each arm stroke. In 1842 another writer of the time, R.H. Horne, concluded that the power derived from the wedge was greater than that derived from the soles of the feet. This started a controversy which continued until comparatively recently.

On 24-25 August 1875, Captain Matthew Webb swam the English channel from Dover to Calais in 21 hours and 45 minutes a feat which gave great impetus to the sport of swimming. Webb used breaststroke all the way. At about this time swimmers were experimenting with overarm type swimming and developed the trudgeon so named after

its inventor, Walter Trudgeon. People were then beginning to loose interest in breaststroke due to the fact that at that time swimming races were not divided into different stroke classifications. The first swimmer to reach the end of the distance of the race was declared the winner, regardless of the style used. It was not until 1906 that races were divided into three classifications for national competition. These were breaststroke, backstroke and freestyle.

This change brought about the start of a great deal of experimentation by breaststroke swimmers in their attempts to increase speed. One of the most notable early innovations was the underwater stroke in which the swimmer submerged and took up to four underwater strokes where the arms were pulled in a wide sweep all the way down to the sides. The kick and the pull were performed simultaneously and not alternately.

Probably the greatest development in breaststroke took place in the period from the early nineteen hundreds to the 1936 Olympic Games. At these games a Japanese swimmer, Tetsuo Hamuro won the 200 metres breaststroke in 02:49.0. In his technique, known as "High Sail" Hamuro kept almost perfectly level with his mouth just clearing the water to breath and not dropping at all during the lunge and the arm stroke. The arm stroke was fairly narrow with the arms pulling back further than we do today.

At the present time the arm stroke is wider than in those days and is followed by a high shoulder and upper body lift. In the modern stroke more emphasis is placed on the inward sculling movement which assists in the raising of the shoulders and on the forward lunge the head drops beneath the surface to provide a more streamlined position during the kick.

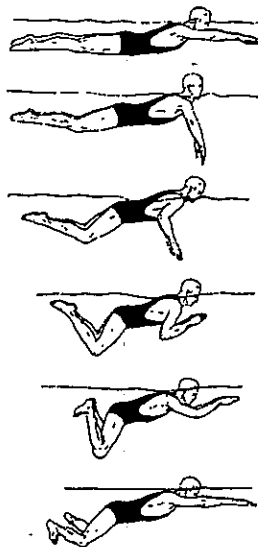


Figure 1

The orthodox Breaststroke style from which modern Breaststroke and Butterfly has developed.

Butterfly

This stroke was developed as a result of swimmers trying to find more speed in breaststroke. Butterfly was first used by Henry Myers in 1933. By studying the rules applying to breaststroke at the time, Myers found that there was no mention of the hands having to be recovered beneath the surface so he experimented with an above water recovery. The normal breaststroke kick was used in the early butterfly. The name "butterfly" was given to the stroke due to the fact that as the arms swung forward in recovery the water streamed off the arms to give the appearance of the wings of a butterfly in flight. Other swimmers soon began to do the stroke and by the time of the 1936 Olympics several swimmers were using it in the breaststroke events. It is interesting to note however that no swimmer at those games covered the whole of the 200 breaststroke on fly. They would swim part of the race on butterfly and the change to orthodox breaststroke.

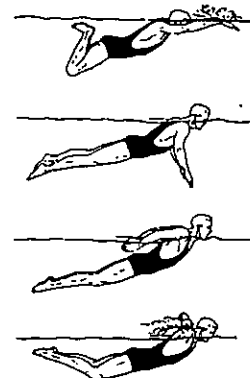


Figure 2

The Butterfly Breaststroke style which developed from Breaststroke.

From 1933 to 1952 butterfly with a breaststroke kick was allowed in breaststroke events and it was not until after the 1952 Olympics that the two strokes were separated. As part of the development of butterfly, in 1935 a swimmer by the name of Jack Seig at the University of Iowa began experimenting with a vertical kicking movement which was the forerunner of the modern dolphin kick. Because this kick did break the existing rules for breaststroke, the stroke was not allowed to be used. After the separation of the two strokes in 1952 when butterfly became a stroke in its own right it became popular and rapid progress was made. Because swimmers were experimenting with the stroke for quite a while before the separation of the two strokes, the technique was well developed to the stage where swimmers were using a double dolphin kick as we do today. The change in the arm stroke into the keyhole type movement was necessary in order to fit in the two dolphin kicks.

Continued on next page.

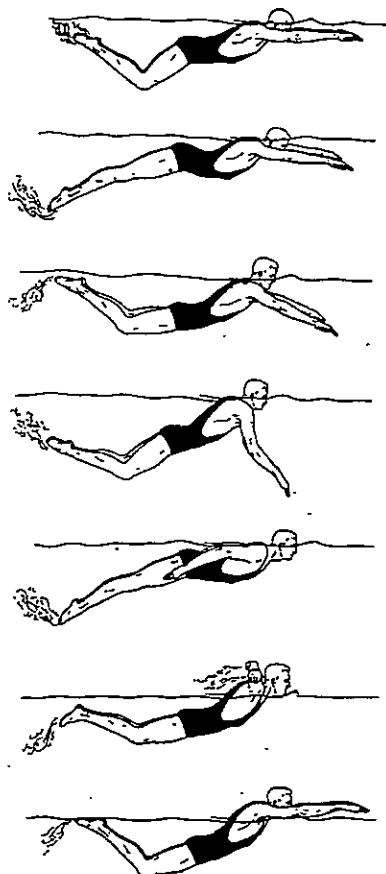


Figure 3

The dolphin fishtail Butterfly from which modern Butterfly has developed.

Over the years since that time progress in butterfly has been nothing short of amazing and butterfly is now the second fastest stroke having passed backstroke in world record terms. In concluding this discussion of breaststroke and butterfly, I would like to quote from Gilbert Collins' book written in 1937. "Do not pin your hopes exclusively to such a dubious proposition as butterfly swimming as it is at the present juncture. Remember that at Berlin the best exponents in the world were not able to maintain the style effectively for more than about seventy five metres at a stretch, whereas the best "high sail" swimmer using the orthodox stroke from start to finish beat all the "butterflies" into a cocoon." Collins then goes on to say that "for those non competitive swimmers--those happy individuals who never need consider the stop watch--I see no reason why butterfly with a restfully wide hand entry should not provide a pleasant and even fascinating variant from the normal style."

Pic Parkhouse

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Recovery Workout

The backstroke's power works on more than swimmers.

by Terry Laughlin

An obvious question that never seems to get asked: "If hard-training athletes are forever being urged to use swimming as a recovery workout, what do hard-training swimmers use?" Auburn University head swim coach Dave Marsh knows. And if his simple answer pinpoints one of the best recovery workouts you can do in the pool, perhaps it pinpoints one of the best recovery workouts for anyone.

Marsh tells his top Freestylers to turn over on their backs, following a hard training set in their main stroke. His reason sounds simple enough. "Swimming Backstroke gives them a chance to work the kinks out of their tired Freestyle muscles with some active rest swimming." But there are several big ideas embedded in that little prescription, all of which can work just as well for cross-trainers who want a quicker recovery from land-based workouts as they do for people who spend almost all their athletic time in the water anyway.

Understandable that Marsh has given the subject some thought. Auburn's swimmers, currently ranked second in the NCAA, cover six to ten miles a day in training -- a healthy load even for a runner, never mind the swimmer, whose body interprets it as the equivalent of a marathon or more six days a week. Add two to three weekly sessions in the weight room for good measure and it's obvious the team's recovery training had better be good. That's what the Backstroke is, and not just for swimmers.

The reason is that while Freestyle and Backstroke are both "long axis" strokes, meaning they share the same pattern of body rotation -- and use many of the same muscles, they use them in slightly different ways. In both, you lie prone in the water and rotate the hips around the spinal or long axis while stroking with an alternating arm pattern.

And though you swim Backstroke with many of the same muscles as Freestyle, the movement is reversed, so easy Backstroke swimming can "massage" tired Freestyle muscles. The ones that were contracting are now lengthening and vice versa. Besides, in Freestyle, the simple act of breathing correctly is a technique and many people tense up if they don't have it just right. Backstroke is more relaxing for them because they can breathe any time they want. On top of that, you get to loosen up and take the session with something less than deadly seriousness. A slightly sloppy stroke technique can be harmlessly brushed off a lot more easily than it could in what most Triathletes, swimmers and cross-trainers consider their primary stroke. The idea is to use "non-prime" strokes for warming and loosening, as in a recovery workout, and save your prime stroke for fast swimming with good form.

And even if swimming is just a sport for your "off" days, you can get a lot out of facing the ceiling instead of the pool bottom. If you're swimming to recover, you should know that Backstroke, thanks to its natural loosening properties, may work even better as a general recovery stroke than Freestyle. And if you're into more serious water work, say training for a Triathlon, Open Water or Masters swimming event, you undoubtedly swim mostly Freestyle and can use Backstroke as a restorative just as Marsh's troops do.

So why don't more people swim inverted if it's so great? The reason is the disconcerting sense of being upside-down and going backwards, and, the difficulty in staying afloat. Both are easy to fix. Get your bearings. Use a line of tiles or lights or other markings on the ceiling to help you set a straight course. Failing that, just hug the lane line. Most pools have a set of colourful pennants hanging across the pool near each end wall. Swimmers call them "Backstroke flags" because they warn you that the wall is 5 yards (three to four strokes) away. Balance your body on your back. On your back, you keep your butt from sinking by leaning on your shoulder blades and the back of your head. (This is "T-pressing" inverted.) Don't put your head back; keep your chin slightly tucked, as if you were holding a golf ball between your chin and throat. That will keep your hips near the surface and you'll ride the waves like a pro, relaxing as you go.

About the Author

Terry Laughlin is one of the most prolific and respected swimming writers in the United States. He is director of Total Immersion Swimming in New York, and teaches the secrets of "slippery swimming" at weekend workshops for adult swimmers throughout the U.S. and elsewhere. For further information about Total Immersion see page 24.

AUSSI RESOURCE CENTRE

A great way to get your club together for a social night / fundraiser is to have a video night. Clubs who may not be able to swim all year round could use this to keep some continuity in their lay-off period.

Items are available for the following hire charges:

| | | |
|--------------|-------------|--------------|
| 1 Video | 1 week \$5 | 2 weeks \$8 |
| 2 Videos | 1 week \$8 | 2 weeks \$12 |
| 3 Video | 1 week \$10 | 2 weeks \$15 |
| 1 AudioTapes | 1 week \$3 | 2 weeks \$5 |
| 2 AudioTapes | 1 week \$5 | 2 weeks \$8 |

A bill will be forwarded to you with the goods (including postage) and payment must be sent with the items, on their return.

VIDEOS

- ◆ Sunrice High Performance Eating Strategies, plus booklet. A good video made better by the booklet
- ◆ Mark Tonelli Gold Medal Series - Best for novices in that it is simplistic, non-the-less it is very well put together with good camera work and footage.
- ◆ AUSSI Coaching Seminar - with Kirk Marks
- ◆ The Athletic Institute Swimming Series
 - 1- Freestyle and Backstroke
 - 2 - Breaststroke and Butterfly
 - 3. - Starts, turns and progressive drills
- ◆ AUSSI Workshop - Tailoring a Programme, plus booklet. This video held in Tasmania features Anita Killmister
- ◆ Stretching - Bob Anderson - A really great selection of exercises demonstrating correct technique.
- ◆ Food for Sport- featuring Karen Inge. Very good!
- ◆ Swimming Fastest - John Trembley. A video and book combination. A *must* for all coaches, teachers and swimmers.
- ◆ Your Backyard Pool is your Home Fitness Centre - as the name suggests, gives ideas to utilise your pool to full advantage.
- ◆ AUSKA - Swimming Strokes - this British production covers technique and drills in all 4 strokes.
- ◆ Masters Stroke Techniques - A biomechanical analysis of the 4 strokes with demonstrations of drills by Masters.
- ◆ ASCA Conference - Masters Stream - Adelaide 1992
- ◆ Strength Training - This 30 min video provides a comprehensive update on the methods and principles of strength training, ie
 - Body Building
 - Isometrics
 - Maximal Weights
 - Eccentric exercises
 Excellent for swimmers and coaches about to embark on a strength programme.
- ◆ Visualisation - Focusing Techniques and mental rehearsals are used extensively by all top athletes to enhance performance. This video gives a comprehensive look at the use of visualisation in sport through various case studies.
- ◆ Media Matters plus booklet - This is hired to you as a kit and is designed for individuals and voluntary groups involved in promoting fitness and healthy lifestyles in the community. It can be used to publicise and attract members, hence is ideal for AUSSI clubs.
- ◆ Exercise Beats Arthritis - A unique series of exercises set to music, designed to keep joints mobile.
- ◆ Give it a Go. Coaching athletes with disabilities.
- ◆ Every Second Counts - Video plus booklet. Effective Time Management in sports training. Whilst this video is not specific to swimming it gives many good examples of how time is wasted in coaching. A good tool for staff workshops or self evaluation.

AUDIO TAPES

- ◆ *The Creative Performance Institute*
 - 1 - Guided Imagery for Racing Risk Taking and Racing
 - 2 - Guided Imagery for Training Commitment and Training Today.
- ◆ *Australian Coaches Conference Series 1990*
 - 1 - The Role of the National Coach in Australian Swimming - Don Talbot -OBE
 - 2 - Integrating School and Club Swimming - Dick Shoulberg
 - 3 - Managerial Perspectives of Parent, Coach, Athlete Relationships- Professor Andrew Coach
 - 4 - Blood Lactate Responses in Masters Swimmers During Active and Passive Recovery - Dr Peter Reaburn
 - 5 - Utilisation of Time and Space for Swimming
 - 6 - Physiological Considerations in Tapering Swimmers - David Pyne
 - 7. - Coaching Butterflyers - Doug Frost
 - 8 - Training and Racing the IM - Dick Shoulberg
 - 9 - The importance of Teaching Good Technique - Laurie Lawrence
 - 10 - The AUSTSWIM Swimming Programme - John Kilpatrick
 - 11 - Long Distance Swimming Training - Dick Campio
 - 12 - High Altitude Training - Ian Findlay
 - 13 - Coaching the Elite Distance Swimmer - Ian Findlay

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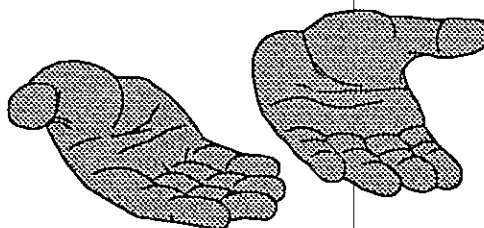
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WANTED

Contributions such as letters, up coming events, club profiles, sample training sessions, poems etc..

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FEBRUARY 1**