

AUSTRALIAN MASTERS COACHES NEWSLETTER

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As a professional swimming teacher and coach operating my own swim school, I have found that in the swimming world, **good** teachers are hard to find, but **great** teachers are extremely rare. Nor does it hold true that good swimmers will necessarily make good teachers or coaches. However, when you do come across an above average swimmer with a natural flair for teaching, you will have found a uniquely talented individual who not only understands the skill, but can feel the skill and transmit this to their pupils better than anyone else.

Similarly, it is my belief that good teachers make better coaches, and good coaches make better teachers.

Now before you all start jumping up and down with examples to prove otherwise (of course there are always exceptions), let me explain.

A coach who has been fortunate enough to work with elite swimmers, knows exactly the precision needed in all facets of a skill to achieve at such a high level. If that person teaches, they approach their teaching with the end goal (elite swimming) in mind. Of course very few swimmers will end up at that level, but the teacher is more likely to teach "best practise" from the very first lesson.

For instance as a coach it is extremely frustrating to inherit swimmers with poor technique from teachers who either can't see the fault, or don't know how to fix it. By the time they move into squad it has become an ingrained habit that is sometimes impossible to fix.

Similarly we get swimmers in squad who jump off the bottom of the pool, who don't streamline when pushing off or diving, who don't start or finish at the wall properly, and who don't leave five seconds apart. As a teacher therefore, my swimmers are taught at the first level of my learn to swim programme how to circle swim, chain swimming, starting at the wall and finishing at the wall every time and starting with a perfect streamlined push every time.

We have varying degrees of success in the early classes, but by the time this has been constantly reinforced at all levels, the swimmers have developed good habits ready for squad.

Similarly, the teacher/coach who has a better understanding of the finer details of technique, tends to have a higher expectation when teaching, and is often more demanding, resulting in a better standard of swimmer. A high standard of excellence early on will save much time and effort trying to undo poor technique at higher levels.

On the flip side, many coaches who have never taught, lack a holistic approach to their coaching. They might be able to correct small defects and get swimmers fit and race smart, but they may not know how to teach a stroke from the bottom up.

Continued over.

MASTERS SWIMMING INTERNATIONAL (MSI)

Masters swimming International (MSI) was formed in 1983 as the culmination of a series of events dating back to 1974.

In that year, a party of US and Canadian Masters swimmers led by Dr Richard Rahe of the US Navy visited New Zealand and Australia. They competed against a group of Australians at Heffron park in Sydney. As a result of this visit, Australian Masters Championships were held at Harbord in 1975 and then in September, AUSSI was formed. The first President was Bill Lough of RSL swimming fame, the Secretary was Gary Stutsel, and the Publicity Officer was Jack Brownjohn, who had tried for many years to stimulate interest in Masters Swimming.

It is history that Gary Stutsel after six years as National Secretary moved that a Pan Pacific Championship be held in Sydney in September 1981. In organising that meet, Gary met Margaret (George) Sampson, a South African-born US citizen, who proposed the formation of an organisation to be named Masters Swimming International.

MSI was formed at the 2nd Pan Pacific Masters Championships in Sydney in March 1983, and went on to organise five World Masters Championships, three more Pan Pacific Championships, World Records for 25m and 50m pools, World Top 10s, and through FINA, uniform rules for Masters (Perth 1991)

AUSSI both as an organisation and through the individual efforts of many of its members, including Carol Davis (NSW), Judy Ford (ACT), Peter Gillet (SA), Glenys McDonald (WA), Graeme McDougall (QLD), and Gary Stutsel (NSW) who is now in his sixth term as President of MSI, has played a leading role in MSI.

In January 1991, MSI agreed to allow FINA to take control of all the elite aspects of Masters Swimming, that is World Records, Top 10, and World Championships. MSI then met in Hamilton, New Zealand in April and voted to pursue the following objectives.

1. To ensure that FINA Rules remain fair to all Masters Swimmers, especially in the area of Drug Testing, and Age Determination, and to lobby for change when necessary.
2. To act as clearing house in assisting countries to exchange programs, ideas, successes and failures.
3. To ensure liaison between countries (initially USA and Australia) to foster programs for Officials Accreditation.
4. To prepare guidelines for a Safety Policy to be applied to club activities and all competitions.
5. To compile a world-wide list of places to swim.
6. To develop festival-style International Swim Meets open to all Masters regardless of ability (no time standards) on a first to enter basis. The first of these is planned for mid 1995.

Thus the role of MSI has changed from serving the elite swimmers to one of supporting and encouraging all Masters swimmers. This move has the full support of all member countries.

Written by Gary Stutsel, and copied from the SPLASH, Journal of NSW Master Swimmers Inc.

Many stroke faults can only be corrected by breaking a stroke down into its fundamental parts and then rebuilding it.

This is particularly true of Master's coaches who generally have a diverse range of standards that are often quite poor. The coach should rank skill development as one of their most important goals.

Continued over.

Give "Swimmer's Shoulder" the Brush-Off

BY PATRICE MITCHELL

Reprinted with permission from FITNESS SWIMMER September 1993.

Back and forth, back and forth I swam as Norman, the lifeguard, counted my freestyle strokes as a form of mental exercise. Twelve perfect strokes up, twelve perfect strokes back, he'd say, shaking his head at the symmetry. And so I'd swim, seldom varying my routine, day after day, usually six or seven days a week, year after year. I should have taken it as a warning when my health club's water aerobics instructor asked if I'd ever experienced the pain of "swimmer's shoulder" from all that freestyle. "Oh, no," I replied nonchalantly. How could I hurt myself swimming?

Incredibly, about two weeks later I felt the first painful twinges in my right shoulder. Must have pulled a muscle, I thought dismissively. I had no time to think about it — it was summertime, my favorite swim season. Savoring the change from indoor pools, I ignored the growing pain and

went right on swimming.

In September, when I visited my primary care physician he gave me the bad news: "You've injured your rotator cuff from overuse. Cut back to swimming only three days a week to see whether that helps."

Help it did, and the pain lessened. But it roared back worse than ever later in the year when I began writing Christmas card greetings and mixing heavy cookie dough batters for the holidays. Now my shoulder muscles ached with every movement, whether it was swimming, writing or simply reaching for a glass.

By the New Year I was out of the pool and in and out of physical therapy for months. How in the world did swimming cause all this trouble?

SHOULDERING THE BLAME

My "swimmer's shoulder" was a result of overusing the rotator cuff, according to Dr. David R. Webb, associate director of the Center for Sports Medicine at St. Francis Memorial Hospital in San Francisco. The injury may be caused by training errors, such as abrupt changes in the intensity or type of workout (the leading reason among post-college age groups); anatomical problems, such as weakness in rotator cuff or upper back muscles; or poor swimming technique.

"Shoulder problems are pretty complex because it's not always clear what's breaking down," says Webb, a former swim coach and triathlete.

Swimmers, particularly those who compete in freestyle, back-

stroke or butterfly events, can strain their shoulder muscles through repetitive overhead strokes.

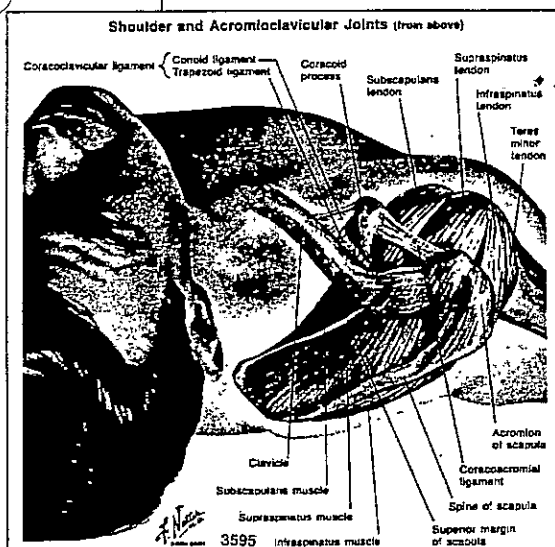
"In theory, the shoulder is a ball-and-socket joint. But in practice, it's a huge ball and a very shallow socket joint," explains Webb. "The shoulder by its shape is inherently unstable. You're dependent upon soft tissues to hold it together, and you're especially dependent on the rotator cuff."

The socket is the glenoid bone, part of the shoulder blade, or scapula. The ball-shaped structure is the humeral head, the upper end of the arm bone. The rotator cuff muscles are a group of four muscles that help rotate the humeral head in the socket and keep it centered as the arm moves overhead.

Poor stroke technique, overuse and other factors can strain the muscles and tendons, causing pain and weakness. Inflammation, tendinitis and, less often, tearing can occur.

"With fatigue, the rotator cuff can't keep the ball centered," says Dr. Lucien M. Rouse, an orthopedic surgeon at the University of Rochester (N.Y.) Medical Center and its University Sports Medicine and Rehabilitation Clinic. "The rotator cuff gets sore and the humeral head starts moving around more."

If the humeral head scuffs against the overlying acromion — a hook-like bone which extends from the shoulder blade — it will bring about a painful condition called impingement, which can tear the rotator cuff.



Unfortunately many coaches often find that what they have taught has not necessarily been learnt. In this issue I have reprinted an article from Jane McCallum of the Australian Coaching Council titled "Ten steps to teaching skills effectively", in an effort to improve coaches teaching methodology.

I hope you like it,

Anita

Highly competitive swimmers tend to have loose joints, which enhance their swimming but may contribute to the instability of the shoulder joint, Rouse says. Their heavy yardage — up to 10,000 meters a day — doesn't help either. It stands to reason then, that someone who's only swimming 1,000 meters a day is not going to be at as high a risk as someone who is swimming 10,000 meters a day.

CURING THE PROBLEM

Rehabilitation may involve a combination of a temporary cutback or elimination of swimming, anti-inflammatory drugs, physical therapy and an assessment of stroke technique.

Dr. Albert B. Craig Jr., a retired professor of physiology at the University of Rochester Medical Center and a longtime assistant to the school's swim team, attributes the cause of many shoulder problems to poor stroke mechanics. It's important for swimmers to use correct sculling motions with their hands, Craig says. "People think swimming is pulling the arm through," he emphasizes. "The rotator muscles are weak and small. If you're just pulling your hand through, you're putting too much stress on rotator muscles."

Therapy treatments include ice, electrical stimulation or deep-heat ultrasound to reduce inflammation and pain, massage, stretching and other exercises to restore range of motion.

Webb says therapists may need to retrain injured shoulder muscles to work correctly in relation to the trunk and upper limbs. They can do this by incorporating an exercise program using weights, machines and stretch bands to strengthen the rotator cuff and related muscles.

For some patients, surgery may be necessary to repair rotator cuff tears or to relieve instability or the pain of impingement.

Medical experts stress a gradual return to pre-injury swimming workout levels to avoid reinjuring the rotator cuff.

PREVENTION STRATEGIES

To prevent rotator cuff injuries, sports specialists recommend stretching out and warming up — in the pool with some moderately paced laps, or out of the pool with some land stretches. (See *Fitness Swimmer*, September 1992, Sports Medicine.) "When muscles are cold and

unstretched, they don't function well," says Rouse.

Rouse also suggests acknowledging, rather than ignoring, the first twinges of shoulder pain, as I did. "A lot of times, with just a couple days of rest it'll calm down," Rouse says. "The earlier you catch something and institute some rest, the shorter the duration of it."

Emphasizing the importance of crosstraining for all athletes, Rouse suggests adding walking or cycling to a fitness swimming routine. "The principle of crosstraining is maximizing the cardiovascular workout without overstressing one musculoskeletal area," he says.

You might consider weight training to maintain muscle balance as well

as swimming intervals and mixing in breaststroke, the stroke that's easiest on your shoulders.

Of course, even if you're injured you should keep up your aerobic conditioning. I, for one, have taken up fitness walking five or six days a week. In the meantime, my doctors and therapists are puzzled by my persistent shoulder problems, especially since I've followed all the usual routes to rehabilitation. As for me, I'm still looking for relief and, every so often, I sneak down to the pool, if only for my mental health.

Patrice Mitchell is a longtime fitness swimmer and the former political columnist for The Rochester (NY) Times-Union.

AUSTSWIM MANUAL 1994 EDITION - Now Available!



The AUSTSWIM Council has undertaken a review of the already revised AUSTSWIM manual which first became available in July 1993. AUSTSWIM has released the second revised edition this month (October 1994).

The 1994 edition has minor adjustments to the original text. However, it is important that teachers recognise the new table in the diving chapter. In an attempt to clarify recommended water depths for diving activities, the original chart has been superseded.

As you can see from the diagram below, the recommended depths are now based on the child's height and will obviously vary according to stature. Of course, as with all activities involving risk it is still critical for teachers to assess a student's ability, consider their prior knowledge and skill progression, and most of all foresee and take appropriate action to avoid any unnecessary risk that may be evident in the activity.

If you purchased a copy of the 1993 manual, it may be a good idea to update this information by cutting out the new chart and inserting it in your manual. We have printed it to mask the existing chart.

Forward Dive

	MINIMUM WATER DEPTH
Surface glide	Step 1 B
Glide to bottom	Step 2 B
Glide to bottom from standing position	Step 3 B
Forward dive from poolside	
- crouch position (sit dive)	Step 4 C
Forward dive from the standing position	
- semi crouch	Step 5 C

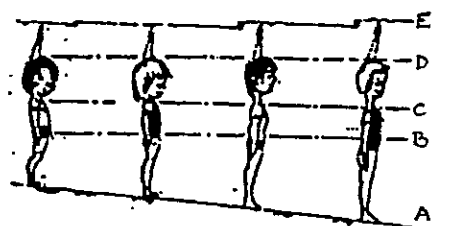
A - Pool Bottom (could be sloping)

B - Waist High water Level

C - Shoulder High Water Level

D - Head High Water Level

E - Extended Arm Water Level



In the last edition of this newsletter the Austswim guidelines for diving were printed incorrectly. The one printed here supersedes the previous one.

Guidelines

PRACTICAL IDEAS FOR TEACHERS AND COACHES

Reprinted with permission from AUSSI SPORT action Autumn 1993

Ten Steps to Teaching Skills Effectively

Coaches and teachers of physical education should rank the skill development or skill improvement of their athletes as one of their most important goals. Unfortunately many coaches often find that what they have taught has not necessarily been learnt by their charges. Jane McCallum from the Australian Coaching Council suggests ways to ensure that the time and effort spent on teaching skills is effective and enables your athletes to experience both success and enjoyment

■ Explain the aim of the learning process

Unless the athletes are clear on what they are supposed to be doing, skill acquisition or improvement will not be effective. The coach also needs to explain why the skill and frequent practice is important.

A clear demonstration of the skill or the practice activity with short verbal instructions will facilitate this. If you are not confident of your ability to demonstrate effectively, the use of video to show correct skill performance is an ideal but under-utilised tool.

■ Know what skilled performance looks like

It is important for the coach to be able to recognise what skilled performance looks like. This does not mean the coach needs a comprehensive understanding of biomechanical principles - repeated observation of both the skilled and unskilled performer will improve your ability to analyse a variety of skills. Observe video footage of expert performers executing the skill so that you are familiar with what it looks like.

■ Plan the best kind of learning experiences

In addition to ensuring good demonstrations can be clearly seen and heard, knowing the way

your athletes learn and their level of ability will help speed up skill acquisition. Children are great copiers and many can be taught a new skill as a whole without needing the skill to be broken down into

component parts. Even skills that seem continuous in nature can generally be broken down. This will help with both skill instruction and error correction.

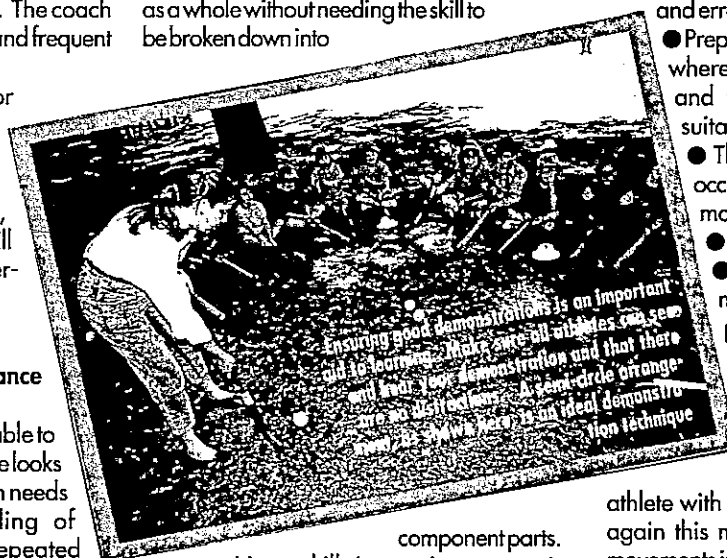
- Preparatory movements (backswing) - where the athletes position their bodies and the sporting implement into a suitable position to move into the skill.
- The forward movement (swing) - occurs from the end of the preparatory movement and the point of contact.
- The impact or release.
- The follow through - where movement slows and the athletes prepare for the next action.

■ Detect and correct errors

Concentrate on those parts of the skill which are the cause of the trouble, do not overload the

athlete with superfluous information. Once again this means breaking down complex movements into simple parts. You may have to view the skill a number of times before you can determine the problem. Don't allow yourself or the athlete to become distracted by unimportant actions.

The following example, adapted from the British National Coaching Foundation (1984) is a useful tool for the beginner coach to use in their sport and help them to become proficient at observing and understanding a skill.



component parts.

Vary skill instruction strategies according to the ability level and learning style of your athletes. This may necessitate small group instruction, but it will be more rewarding and beneficial for all concerned. Those who master skills quickly can assist others.

■ Know how to break skills down

Some skills need to be broken down into

The first step is to create the vision (goal). The vision creates desire. The desire creates the willpower and the commitment.

The process of error detection and correction

Example Skill: the backhand drive in squash

STEP 1:	STEP 2:	STEP 3:
Movement to the ball	Good	No Correction
Body position and balance	The problem	Correct now
Racket swing	Needs improvement	Correct later
Contact with ball	Needs improvement	Correct later
Follow through	Acceptable	Monitor

In this example the coach has identified a number of areas that need improvement but has focused on one problem to correct first. When the athlete's body positioning has improved, the coach can work on other identified problems. Don't despair if you find this task difficult initially - frequent observation and practice will help you develop a 'coach's eye'.

■ Provide opportunities for appropriate practice

Allowing sufficient and appropriate practice activities is essential. The coach must structure practice tasks that are motivating, challenging and relate to the demands of the activity.

Many coaches 'overkill on skill', over emphasising the error detection and correction element of skill development without allowing sufficient practice time. Feedback is essential but too much can be confusing, detrimental to motivation and the development of an athlete's ability for self monitoring. Small-sided practice activities with some feedback are best - enabling your charges to have fun while practising and also contributing to the development of tactics, teamwork and fitness.

Practice relating to the demands of the activity is important. Often skills are taught and practised only in a relatively predictable and static environment, when in fact the skill will be used in a dynamic and constantly changing situation. The basketball dribble relay - a frequent practice activity - is a prime example. All players get to touch the ball, and will probably improve their performance of the skill. Unfortunately the opportunity for practice against an opponent does not occur. The more skilful players quickly become bored, and the less skilled, when challenged in a game situation, lose control of the ball and experience failure.

This activity is appropriate during the initial stages of learning, but coaches must employ practice activities that relate to the demands of the activity and challenge and extend the

learner.

Minimising the time spent talking, organising equipment and changing from one activity to another will also increase the practice time available.

■ Provide specific feedback

Spectator type feedback such as "good shot", "well done" or "that was hopeless", apart from enhancing or diminishing self-esteem, does little to help the student improve performance or understand why they were unsuccessful. When coaches provide specific feedback, for example, "that pass was good, but next time make sure you step onto your opposite foot",



or "great intercept, that time you focused on the ball", athletes

learn:

- whether they are performing the skill correctly. This is very important for beginners who have difficulty analysing their performance or knowing which aspects to concentrate on;
- that the coach places importance on the

quality of the skill performance.

Feedback can also be visual or manipulative but make it specific.

■ Encourage players to monitor and comment upon their own performance

Self monitoring, once developed, is always available to the athlete and acts as a powerful motivator. Teaching your athletes to frequently evaluate their skill practice by asking what aspects of a skill they felt they performed well, and what areas they could improve, will increase knowledge of the skill and ensure that the coach is not the only source of reinforcement or analysis.

■ Provide frequent praise

Praise should be consistent and sincere as learning occurs best in a supportive environment. Frequent recognition helps enhance self-esteem, establish positive attitudes and contribute to learning. Remember, praise need not be just verbal.

■ Evaluate and monitor the learning process

In addition to monitoring their athletes' progress, the coach (and in turn the athlete) can benefit immensely from continually asking questions to evaluate their coaching sessions.

- Did my athletes really understand the skill explanation/demonstration?
- How much time was spent in productive practice?
- Am I providing appropriate and challenging practice?
- Am I providing sufficient specific feedback? (Make an audio tape of your session to find out.)
- Do I spend too much time on talk, organising equipment and activities?

■ Summary

Effective teaching skills is a challenging, but essential, component of any program conducted by the coach or physical education practitioner. Following these steps will contribute to coaching sessions that result in definitive improvements in the skill levels of your athletes.

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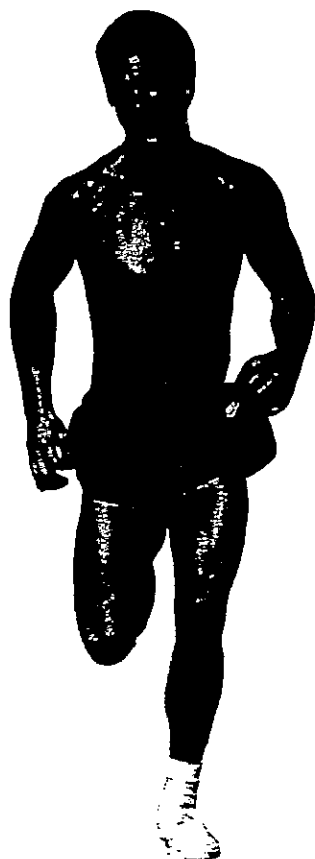
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Talent is the raw material which is doled out in unequal proportions. But this talent must then meet temperament which comes from, where? It's the trick question. Who knows? Nature or nurture? And it's the talent plus temperament that equals ability, an immortal duet which determines success or failure. (Geraldine Doogue)

Who's More Efficient?

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THE SWIMMER



by Howard Wainer

The recent Olympians provided a demonstration of how quickly extraordinary humans can move themselves. Runners and swimmers traversed distances at or near world record times. Certainly runners go faster than swimmers, but how much faster? Humans seem better adapted to locomotion on land than through water, but how much so? One answer was proposed about 20 years ago by the eminent physiologist Knot Schmidt-Nielsen, who concluded that "Man, however, is so ill-adapted to moving in water that swimming costs him five or ten times as much energy as does running the same distance on land" (1972, p.227). Schmidt-Nielsen arrived at this conclusion through the use of an index based on the number of calories needed to move one gram of matter one centimeter. This index is independent of speed. Is this plausible? Does a car use as much gasoline at 30 mph as it uses at 80 mph?

Physiologists have established that Schmidt-Nielsen's conclusion is not true for swimmers. For example, Liljestrand and Stenström showed that the energy cost per unit distance increased with speed from 28 ml O₂/m (at 1.2 km/h) to 49 ml O₂/m (at 3.0 km/h) for a 90-kg breaststroker. They also investigated runners and arrived at similar conclusions regarding the variability of energy utilization with speed. But perhaps this variation is not large enough to impair the usefulness of an approximation that assumes equality across the range of velocities encountered.

A reasonable way to gain some insight into the validity of Schmidt-Nielsen's contention is by looking at world record

times in swimming and track. We are assured that the holders of these records are experts and were giving it all they had. The records are as of 31 August 1991 (from Whitaker's Almanak 1992) and are shown in Table 1. We limited times to about 15 minutes because that is the longest pool race. There are marathon swimming races of 10 miles or more that take several hours, but these are complicated by weather conditions, tides, currents, etc. These events parallel road races that are affected by terrain. Thus, to maintain some sense of standardization, we have focused this description on the controlled conditions in a pool and on a track.

To allow easy interpolation, we fit a smooth function to these data (separately for men and women and for swimming and track). We are unconcerned about the form of this function as long as it gives good fits throughout the range of values; a quadratic function of log distance to estimate log time fit well enough for our purposes. We then calculate the ration of swimming times to running times for each distance and found (Fig. 1) that the relative efficiency ranges from about 5.5 at 200 meters down toward 4 at 1500 meters. There is an anomalously low value at 100 meters due to the effect of the start in running, which will be ignored in subsequent discussions. Women seem increasingly more efficient in the water than men as distance increased. We note that neither ratio appears near an asymptote. Thus, from these data, we must conclude either that: —Schmidt-Nielsen's conjecture (that man is 5 to 10 times more efficient on land than water) is only true for very short distances, and some factor closer to 4 is more likely to be cor-

Efficiency

rect asymptotically, or—that swimmers are much better conditioned athletes than runners because they are capable of expending more energy than runners over a fixed distance.

Obviously, the results obtained from the world records do not square very well with Schmidt-Nielsen's conjecture. Part of this difference is due to the incorrectness of Schmidt-Nielsen's simplifying assumption that energy utilization is independent of speed. Interestingly, Liljestrand and Stenström refer to results from as early as 1859 that contradict this assumption.

But I believe that there is another flaw. Exercises that take 10 seconds command very different efforts than those that take 1 minute. It seems more logical to condition on equal time than equal distance. This thought is certainly not original with me; the syndicated columnist Russell Baker (6/18/72) arrived at the same conclusion, although in a very different setting. Baker was upset that the Parisian models at a New York fashion show were being applauded for their fortitude and devotion in coming thousands of miles (in the first class cabin of a 747 nibbling canapés and sipping champagne), whereas no one thought much of his effort in driving to the show on the Long Island Expressway (LIE). Baker's feeling was that distance traveled is no longer a proper indicant of energy expended; he proposed instead the agomin (minutes of agony) the appropriate unit of effort. According to his calculations, his drive on the LIE was at least equivalent (in agomins) to the 7-hour flight that the models endured.

Is average effort the same in running 100 meters (about 10 seconds work) to swimming 100 meters (about 50 seconds work)? Indeed, is it the same sort of exercise at all? Moving through different media requires differing amounts of work. Running 100 meters is not the same as swimming 100 meters, just as a mile on the Long Island Expressway is not the same as a mile in the first class cabin of a 747. We can hold effort constant by conditioning on time. The results of such an analysis are shown in Fig. 2.

Although the basic message is the same when we condition on time as when we conditioned on distance, the overall level has dropped. In 20 minutes the best male runners can run about 3.75 times as far as the best male swimmers can swim; for women, it is about 3.5 times as far. When we conditioned on distance, we concluded that it took the best female swimmers about 4 times as long to swim 1500 meters as it took the best female runners to run it; for males, it was about 4.25 times as long. In either case, it is clear that the curves have not reached asymptote, and the trend suggests that the longer the distance of the time, the more effi-



TABLE 1—World Record Times in Swimming and Track as of August 31, 1991

Distance (m)	Swimming Records		Track Records	
	Men	Women	Men	Women
50	21.31	24.89		
100	48.42	57.79	1:04.91	1:04.91
200	1:48.55	2:07.55	2:17.72	2:17.72
400	4:09.5	4:43.85	4:42.4	4:43.85
800	9:47.85	10:18.22	9:54.2	9:54.2
1,000			10:21.8	
1,500	14:50.36	15:52.10	15:24.7	15:24.7
2,000			15:58.1	15:58.1
3,000			21:29.15	21:29.15
5,000			32:54.39	32:54.39
10,000			71:03.22	71:03.22

cient humans become in water relative to on land. Perhaps this is due to better conditioning of swimmers or perhaps because the better heat dispensation in water allows greater exertion for longer time. There has been some discussion in the exercise literature that swimmers are the best conditioned athletes because the benign character of the sport allows them to train harder than anyone else. These data do not contradict that conclusion indeed, we shall shortly present more direct evidence in support of this.

The greater efficiency of women relative to men in the water is also noted. There are many possible explanations for this (i.e., higher percentage of body fat in women is less of a detriment in swimming than in running), but we will not speculate further. We will content ourselves with an approximate answer to the title question: Humans can run about three to four times as efficiently as they can swim; exactly where the answer lies within this range depends on the length of the exercise and the sex of the exerciser. Of course, this conclusion makes some assumptions about energy utilization during the course of a world record. Fundamentally, we assumed that for an exercise of the same duration in time an athlete setting a world record is using maximal energy possible whether in the water or on the land. This assumption could be tested if one could gather data on energy utilization (expressed as a unit like joules/ meter conditioned on time for the exercise).

Such data were actually gathered by Piet di Prampero, who in 1986 presented estimates of energy, in joules per meter, used by elite ath-

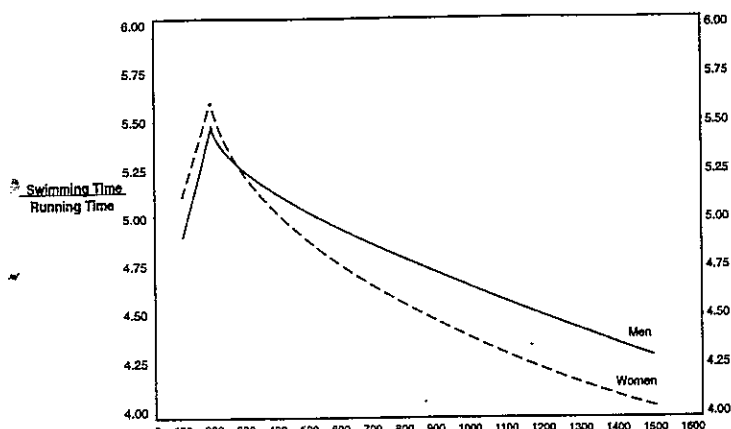


photo by Budd Symes

The only place success comes before work, is in the dictionary.

Efficiency

FIGURE 1. Ratio of swimming to running times to traverse a fixed distance.

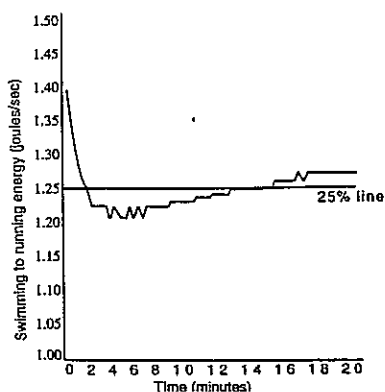


letes while running and swimming for exercises of various lengths. From di Prampero's data we obtained a function describing the relative efficiency of swimming versus running.

This function is shown in Fig. 3. Why is the conclusion we reach from di Prampero's physiological data (men run 4.6 times more efficiently than they swim) different from the one reached indirectly from world record data (men run 3.75 times more efficiently than they swim)? The difference must be bound with my assumption that world-record-setting athletes use the same amount of energy for exercise of the same time regardless of the activity. Men apparently can exert more energy per second swimming than running, but how much more?

Combining the two sets of results (Figs. 2 and 3) by transforming these estimates to energy expenditures per unit of time (joules per second) yields the ratios shown in Fig. 4 and indicates that male swimmers expend about 25 percent more energy than male runners per unit of time. One can conjure up two components of an explanation for this finding. First, elite swimmers are better conditioned than comparable runners. This is because elite swimmers commonly train about twice as much time each day as elite runners. As mentioned earlier, such intense training is physically possible because the more benign character of swimming does

FIGURE 4. In comparable exercises swimmers exert about 25% more energy per second than runners.



not cause the physical wear-and-tear of an equivalent amount of running. Second, swimmers have more opportunity to expend energy because swimming seems to involve the body's total musculature more fully than does running.

If we believe that the result shown in Fig. 4 is approximately true for

women, we can predict the energy results for women. To the best of my knowledge, these have not yet been gathered (i.e., multiply the appropriate result in Fig. 2 by the one observed in Fig 4).

An important point of this article is methodological. One can describe the relative efficiency of locomotion with a statistic that conditions on time or distance, but which is more suitable, depends on the prospective use. If we wish to know how many calories an athlete needs to traverse a particular distance, conditioning on distance is the obviously correct statistic. But if we are interested in the broader question of the relative efficiency of locomotion, we need to control effort and expertise. Using world record holders assures the latter; conditioning on time, the former. When looking at relative efficiency (ratios), conditioning on time has clear interpretive advantages.

So we realize that a full answer to the question posed in the title must be parsed into two component pieces. It does not suffice to say merely that elite runners transport themselves on land with about 4.5 times the efficiency that elite swimmers do in the water, but rather that they do so because:

- swimmers exert about 25 percent more energy per second

FIGURE 2. Ratio of running to swimming distances in a fixed amount of time.

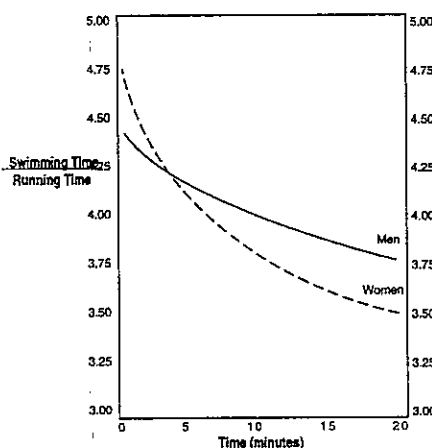
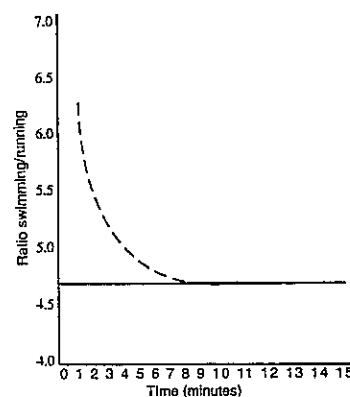


FIGURE 3. Efficiency of swimming to running increases as time increases to what appears to be an asymptote at 4.6



than do comparable runners, and consequently,

- runners traverse about 3.75 times the distance that comparable swimmers do in the same amount of time.

The story is a bit more complex than we had anticipated, but its richness was worth the trouble it took to disentangle it.

(This research was supported by the Trustees of the Educational Testing Service through their Senior Scientist Award. I am pleased for the opportunity to acknowledge their generosity. I would also like to thank Tom Jirole, John Rolph, Hal Stern, and Rebecca Zwick for their helpful comments on an earlier version of this article.)

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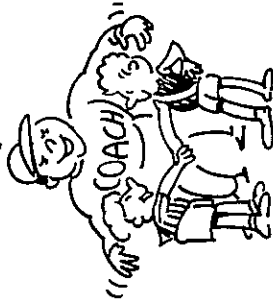
This article was reprinted from *Chance: New Directions for Statistics and Computing*, Vol.6, No. 1, 1993.

THE COACH AND SOCIAL ATTITUDES

Because the coach may have lasting and important influences on players, both in their social and moral attitudes, effective coaches ensure appropriate team standards are set and met in on-field and off-field behaviour. Sport in itself will do much to mould and adjust the character of participants, however, a positive and sportsmanship approach by the coach will usually provide long-term benefits to the individuals.

Any coach who supports winning at all costs and who offers cheating and often-witnessed aggressive attitudes as alternatives to "good sports", shows little respect for society in general and little thought for the character development of players.

Coaches should provide situations where players experience the attitudes expected in our society. Good sportsmanship and friendly, competitive associations will enhance performance.



THE COACH AND THE IMAGE

One aspect of coaching which is often overlooked by coaches is the effect the coach has on individuals concerning:

- ★ politeness
- ★ dress standards
- ★ verbal abuse and swearing
- ★ general mis-behaviour

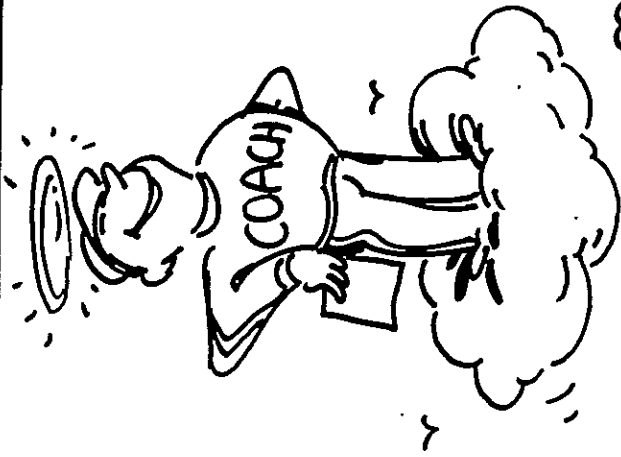
An effective coach should always set the example for the players, particularly for younger children. Coaches should never try to improve performance through intimidation or aggressive remarks.

COACHING ASSETS

Once you have the knowledge of the game and general coaching methods, the coach must use these in the practical art of improving performance. Without knowledge, nothing can be provided to the players. Once a coach has the knowledge, the important thing is to allow one's natural personality to override the way in which the messages are passed to the players. Knowledge can be learnt and lost. It can be re-learned and amended. However, our personality has been developed over many years and will take just as many to change. There is no correct blueprint of the successful coach but we do know that most of them have some of the following characteristics:

ARE YOU?

	Always	Sometimes	Never
KNOWLEDGEABLE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HARD WORKER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ENTHUSIASTIC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PATIENT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SHOWS INTEREST	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MOTIVATOR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DEVELOPS POTENTIAL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ENCOURAGING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POSITIVE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
GOOD TEACHER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CONSTRUCTIVE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LIKEABLE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SENSE OF HUMOUR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RESPECTFUL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ORGANISER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BUILDS CONFIDENCE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
GOOD COMMUNICATOR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
UNDERSTANDING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POLITE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SENSITIVE TO NEEDS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HONEST	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
QUALIFIED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



WHAT SORT OF COACH ARE YOU?

Sport Coaches Australia is the coaching arm of the Confederation of Australian Sport. This brochure is part of a series on general coaching information prepared by Executive Members of the Confederation's coaching assembly for the betterment of sports coaches within Australia. The Committee Members are Mrs Wendy Ey (Chairperson), Mr Peter Corcoran (Deputy Chairperson), Mrs Pam Barham, Mr Nigel Champion, Mr Dennis Coffey, Ms Di Learmont, Mr Ivan Spedding. More details on Sport Coaches Australia or the Confederation of Australian Sport may be obtained by writing to the Secretary, Mr Garry Daly:



78 Jolimont Street, JOLIMONT VIC. 3002
Telephone (03) 63 4858

THE ROLE OF THE COACH

As an individual or team coach you can influence your players':

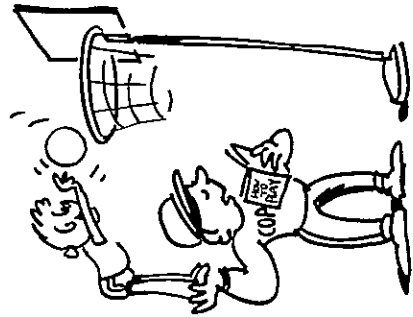
- ★ performance level
- ★ enjoyment of sport
- ★ motivation
- ★ moral and social values

A coach who is knowledgeable, patient and understanding will assist players to improve their performance. Improvement in performance of the players must be used to assess the relative value of the coach, but sometimes this is not the whole story. Coaching often means more than improving players' performance.

THE COACH AND KNOWLEDGE

Before a coach can begin, the first requirement is knowledge. To ensure planning, proper organisation, skill analysis and effective feedback, a coach must know about coaching. This usually comes from learning details, either through the reading of books or through practical assistance from those who have the necessary knowledge.

Once knowledge has been obtained, coaches must ensure that they use this knowledge in the correct manner. Feedback to players in a simple and easily understood language will be far more beneficial than complex and detailed instructions.



THE COACH AND PATIENCE

After the feedback stage, coaches must be patient. It is often forgotten that coaches must be understanding and aware of players' needs, so that improvement will occur within the limits of the player's abilities and desires. This aspect is usually the cause of coaching failure. That is, the coach who tries to impart too much pressure on average players, usually expecting too much in a short time, will take away much of the pleasure from training or playing.



THE COACH AND FUN

Coaches should remember that sport is meant to be fun. For most of us sport provides a form of satisfaction through participation.



THE COACH AS A MOTIVATOR

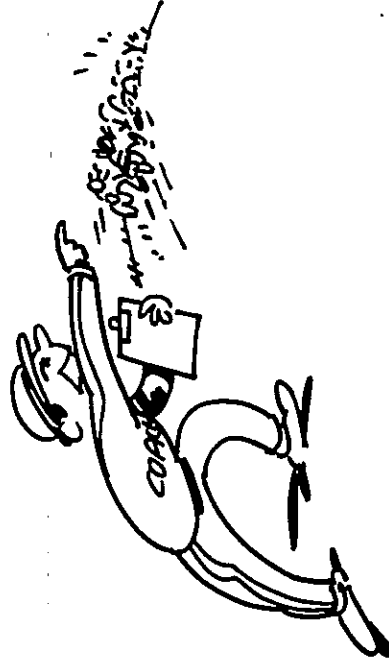
Coaches of individual performers must be aware of the driving reasons behind the participant's involvement. Players usually become attached to a sport for one or more of the following reasons:

- ★ **ACHIEVEMENT** – the desire for improvement
- ★ **AFFILIATION** – the desire for friendly associations

- ★ **SENSATION** – the desire for the stimulating effect
- ★ **SELF-DIRECTION** – the desire to control one's direction

As a good motivator, the coach chooses the line between the physical and emotional needs of the performer. For team coaches this problem becomes more difficult because of the varying needs of each of the members in the team.

Coaches must always try to channel both the physical and emotional forces in the same, desired direction.



Some ways in which the coach can assist players to achieve their needs are:

- ★ the setting of realistic goals
- ★ identification and praising of individual improvements
- ★ avoid the mis-matching of performers
- ★ encourage and assist with team outings
- ★ ensure variety
- ★ allow players to make individual and group decisions

MASTERS SWIMMING
CANADA (Inc.)

MAÎTRES NAGEURS
du CANADA (Inc.)



1

SEPT. - JUNE SWIM - WORKOUTS

Jamie Connors - Nova Scotia

Please Circulate Among Your Club Members-

For distribution and use by Masters swimmers - please copy freely or -
for additional copies send \$5.00 to:

MSC National Office
Jackie Spry - Exec. Secretary
Box 526
Elmsdale, N.S. B0N 1M0
902-883-8833 (voice or Fax)

MASTERS SWIMMING CANADA

SEPT. - JUNE SWIM-WORKOUTS by Jamie Connors

It is the aim of Masters Swimming Canada to publish a series of such 'Swim-Workout' manuals. These are not workout schedules that are promoted as a 'MSC standard' in any way but simply presented for enjoyment by swimmers and perhaps as a useful reference guide. The theme of this workout schedule is its continuity from Sept.-June and stressing building and maintaining fitness. The only criteria used in its selection is that it was 'enjoyed' by other swimmers and should be maintained in its original format. There is no doubt that there are probably others who would enjoy it also. MSC is soliciting such workout programs from all Masters clubs across Canada for publication with these 2 points in mind; 1) that it have a theme and 2) that it was an enjoyed by a group of swimmers.

The following workout schedule was given to a group of 'noontime' swimmers at the Dartmouth Sportsplex (Dartmouth, NS) by a Masters' Coach - Jamie Connors - during 1987. The workout schedule was designed to carry swimmers through from Sept-June. It stressed 'building fitness' throughout the year, maintaining that fitness and was not related in any way to preparing a swimmer for meets. Practices were 1 hour each and took place on Monday, Wednesday and Friday. There were 2 groups of 'noontime' swimmers and the practices were tailored accordingly. There were the 'Fast' & 'Intermediate' sets - basically differing in pace times and distance. Both groups enjoyed the practices immensely - try it and see which you enjoy best!

TERMS

- 4x100 swim 100 m (yds) 4 times.
- :15 15 seconds rest - numbers this low refer to rest period.
- 100m 2:00 swim 100 meters distance every 2 minutes.
- 100m :15 swim 100 meters and take :15 seconds rest -use judgement as to whether stated time is rest time or pace time.
- build means increase speed as you progress - e.g., swim 200 meters and build 50's means each 50 m becomes increasingly faster but maintain steady pace during that 50 m portion.
- DPS Distance-per-Stroke - extend reach and pull back far as possible - not fast but efficiently.
- H.R. Heart Rate - take heart rate after every set indicated.
- fr/bk/br free/back/breast
- stroke other than freestyle - bk/br/fly.
- choice any one of fr-bk-br-fly.
- 1/2L 1/2 the length of the pool.
- ez easy - swim as cool-down.
- ↓(1-3) descending 1-3 - e.g., (2 sets of 3 [100's] - ↓[1-3] means swim each of the 3x100m with increasing speed (descending swim time) and repeat the set twice.

FAST

SEPTEMBER	
Monday	Wednesday
4x150 -100 swim/50 kick	2x350 -200fr + 6x25 stroke
8x75 -(25) bk/br/fr	8x50 -free choice kick :20
6x100 -free 50 smooth/50 fast	8x100 free 2:00 1:00 min rest at 4th
4x25 -drill choice	-100 easy
Total 1900	Total distance 2000
Friday	Monday
10x50 -free :10 rest	8x75 -bk/br/fr :15
6x125 -100fr + 25 stroke :20-30 rest	16x50 -4 sets of 4 1) free 1:05 2) stroke 1:15 3) free 1:05 4) stroke 1:15
16x25 -10 fr + 6 stroke easy/hard :15 rest	8x25 kick hard :20 8x25 swim hard :20 50 easy
4x50 -free drill	
4x50 -worst kick :20 rest -50 easy	
Total distance 2100	Total distance 1850
Wednesday	Friday
Warmup 25fly-50bk-75br-100fr-75br-50bk-25fly	2x300 -200fr :15 4x25 stroke :10
8x150 -free 3:00	12x75 -3 sets of 4 1-4: 25 str/50 fr 1:45 5-8: 25 fr/25 str/25 fr 9-12: 50 fr/25 stroke
8x50 -25 distance per stroke -25 fast	6x50 odd - 25 kick/ 25 fr 1:30 even- 25 fr/ 25 kick 25 hard/25 easy
Total distance 2000	Total 1900

Masters Swimming needs more members if it is to thrive. Lend your weight to the recruiting effort.

FAST

OCTOBER	
Monday	Wednesday
12x50 choice :10 3x (200 fr 4:00 + 4x50 str. 1:10) 1:00 min rest between 4x100 choice kick :20 1x100 easy	8x75 odd - free :20 even - stroke :20 6x200 free 4:00 8x50 25 bk drill/ 25 full stroke 50 easy
Total 2300	Total 2250
Friday	Monday
4x150 (100 swim +50 kick) :15 3x400 1) fr 2:00 2) fr/str. 2:20 3) fr 2:00 (hard) 4x75 25 - best kick 25 - stretch breast 25 - full stroke	warmup 25 fly-50 bk-75 br-100 fr-75 br-50 bk-25 fly 2x300 free 1) swim 'breath control' 2) pull 150 easy 12x50 (4 sets of 3) 1) fr 1:05 2) fr/str. 1:20 3) fr 1:05 4) str. 1:30 6x75 25 kick/25 swim choice 2:00
Total 2100	Total 2200
Wednesday	Friday
6x100 25 drill/25 swim :20 8x125 1-4: 100 fr/25 str. 5-8: 25 str./100 fr 10x50 1-4: bk drill/bk 1:30 5-8: br drill/br 9-10 choice	6x100 25 drill/25 swim :20 5x150 pull free :30 1x150 swim 4x100 choice kick :20
Total 2100	Total 1900

FAST

OCTOBER	
Monday	Wednesday
12x50 1-4 drill/swim free :15 5-8 stroke 9-12 free	8x75 25 kick/25 drill/25 swim 1-4 stroke :20 5-8 free
10x100 25 smooth - check stroke 2:15 75 swim fast 2:20	6x200 free 4:00
5x125 25 no-board kick + 100 swim stroke 3:00	14x25 alt. drill/sprint choice :45 50 easy
Total 2300	Total 2200
Friday	Monday
4x 50 swim/50 kick/50 swim :20	2x400 build pace 50-200 & 250-400 1:00
16x75 odd - bk,br,fr 2:00 even - free 1:30	8x150 1-4 build 50's 3:00 5-8 steady pace
10x50 25 fr/25 stroke 50 ez	8x50 50 kick 25 hard/25 easy :15 alternate with 50 swim
Total 2400	Total 2500
Wednesday	Friday
2x {200 stroke (:30) + 8x25 free (:30)}	16x50 4 free :10 4 choice 4 free 4 choice
12x100 1-4 free 2:00 5-8 stroke 2:30 9-12 free 2:00	3x (200 fr + 8x25 kick) :30
12x25 3's easy/hard/very hard :40	2x75 breast 25 glide/50 swim 50 easy
Total 2350	Total 2200

FAST

NOVEMBER	
Monday	Wednesday
12x75 alternate fr./str. :20 1-6 medium 7-12 hard	8x100 4 free :10 4 choice
6x200 free ↓ 1-3 4:00	10x125 1-4 75 building/50 fast 2:30 5-8 125 fast 9-10 choice
16x25 choice ez/mod/hard :40	8x50 free/stroke 1:10
Total 2550	Total 2500
Friday	Monday
4x200 100 ez :30 100 hard	3x 100 free :20 75 br :15 50 bk :10 25 fly :45
15x75 (3 sets of 5) 1) stroke 1:45 2) free 1:30 3) stroke 1:45 4) free 1:30 5) stroke 1:45	16x50 (4 sets of 4)- 1st & 3rd - steady pace 1:00 2nd & 4th - ↓ 1-4 1:00
8x50 odd- 25 hard kick/25 ez swim 1:15 even- swim/kick 50 ez	4x150 choice :30 building by 50's
Total 2400	Total 2300
Wednesday	Friday
5x150 build by 50's :20	16x50 1-8 25 drill/25 swim :10 9-16 swim
12x100 (4 sets of 3) 1. 50 ez/50 hard 2. steady all free 3. 50 ez/50 hard 4. steady	9x125 (1-3) 75 build + 50 fast (4-6) 50 " + 75 fast (7-9) 25 " + 100 fast
6x75 25 drill/50 swim :20 3-free/ 3-choice	4x100 50 ez/50 hard
Total 2400	Total 2300

FAST

NOVEMBER	
Monday	Wednesday
10x75 25 drill/50 swim :20 1-5 str. - 6-10 free 3x (2x100 smooth free) 2:00 3x (4x50 fast free) 1:00 4x75 hypoxic breath every 2,3,4,5th stroke 1:30	6x100 3 free drill :20 3 free 12x75 (4 sets of 3) free 1:30 1) 25 ez/mod/hard 2) 25 mod/50 hard 3) 75 hard 5x50 25 drill/25 swim :15 150 cool-down
Total 2300	Total 1675
Friday	Monday
3x400 1- free (mod) :30 2,3- free (hard) 5x (4x50) 1. free :10 2. 25 fr/25 str. :10 3. free :10 4. free :10 (extra 1 min between sets - take heart rate) 3x75 25 drill/50 swim :15	16x50 1-8 choice :10 9-16 free 4x (3x100) free 1. ↓ 1-4 2:00 2. steady 3. ↓ 1-4 :30 between each set 3x150 1 & 2 alternate 25 IM order/25 free :15 3. choice
Total 2500	Total 2500
Wednesday	Friday
8x100 free ez/hard :30 8x150 build by 50's 1:30 4x75 stroke :15	3x200 1 ez/2 mod/3 hard 16x50 1-4 & 9-12 free 1:00 5-8 & 13-16 25 fr/25 str 1:10 6x100 1-3 build by 25's 2:00 4-6 fast 10x25 alt. ez/hard
Total 2300	Total 2400

FAST

DECEMBER	
Monday	Wednesday
warmup 50 fr-75 str-100 fr-125 str-100 fr-75 str-50 fr 8x100 free 2:00-2:00-1:55-2:00 1:50-2:00-1:45 50 ez 8x75 free- Hypoxic breathing 1:30 1-6 breathe each 3,4,5th stroke 7-8 each 4,5,6 stroke 8x50 25 str/25 fr 1:15 alt hard/ez 50 50 ez	8x100 4 - free drill :10 4 - pull :10 12x75 1-4 bk/br/fr 1:45 5-8 free 1:30 9-12 bk/br/fr 1:45 12x25 kick 25 ez/25 hard 10x25 swim 25 ez/25 hard
Total 2450	Total 2350
Friday	Monday
2x400 free build by 50's 0-200 - 200-400 9x125 (1-3) free 2:30 (4-6) choice (7-9) IM + 25 free 2:45 4x100 1,3 IM hard :20 2,4 free ez 150 ez	10x75 5- free 25ez/25mod/25hard 5- stroke :15 20x50 1-5 & 11-15 free 6-10 & 16-20 25str/25fr :10 on ea 50 - 1:00 after ea 5 50 ez 20x25 1-10 alt. kick/swim 11-20 alt. swim/kick alt. ez/hard
Total 2600	Total 2300
Wednesday	Friday
5x150 50 swim/50 kick/50 swim 4x (1-3) ↓ (3x100) set 1,2,4 free 2:00 set 3 choice 2:15 50 ez 6x75 breathe ea. 3,4,5th stroke :15	XMAS HOLIDAYS EAT, DRINK & BE MERRY !!
Total 2450	

More workouts will be reprinted next issue

OPEN WATER SWIM NAVIGATION

By Barry Young - North Shore Masters

With the season for open water swims almost upon us, here are some tips from a dedicated sea swimmer who, besides being a Masters world record holder, is also a professional navigator. When Barry isn't swimming, he teaches small boat navigation and safety courses in Auckland with the City of Sails Maritime School. During the winter, accompanied by his wife Sue, he is usually to be found cruising the South Pacific in his yacht.

Plan your race

It pays to do a bit of homework before a race. Find out the times of high and low water. Most races are timed to be swum on the top of high water because it is easier to enter and leave the water at that time and tidal flow is at a minimum. However some races are swum at half tide with the tide helping you, (like the Durham Light harbour swim in Tauranga). Remember that the strongest tidal flow occurs half way between high water and low water and it is usually found in the middle (or deepest part) of the channel. There is less tidal movement close to the shore. This means that if the tide is running with you, you should be out in the centre of the channel whereas if the tide is against you, keep close in to the shore.

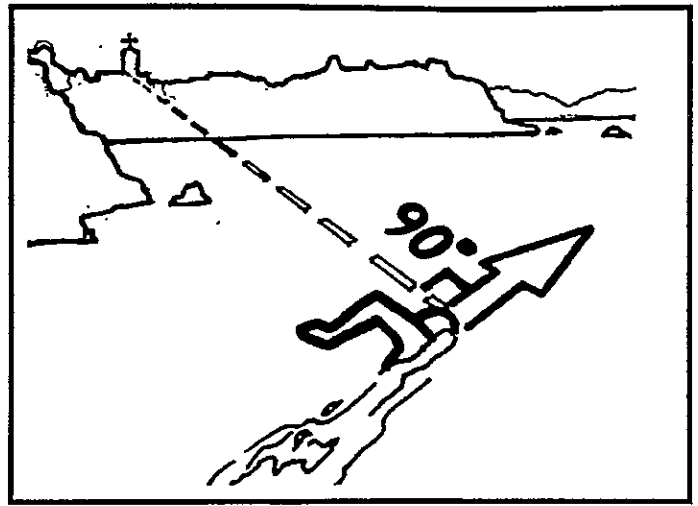
As you walk down to the start, take careful note of how nearby yachts are facing on their moorings. If there is no wind, those boats which are free to swing will point into the tide. Also, if the tide is strong you will be able to see the water swirling away from the stern of the boats as though they were moving through the water. Strong winds can change both the time and strength of tides so if it is stormy be prepared for unexpected sets.

The Warm-up

Try to enter the water a few minutes before the start and swim a hundred meters or so. This raises your heart rate and gets you used to the cold water. If you have trouble with your goggles fogging up, leave a few drops of water in them when you put them on. After that, a vigorous shake of the head will swish the water round them and keep them clear. For good navigation it is essential to be able to see where you are going. Never just follow the person in front of you in the hope that they know where they are going. They probably don't!

Staying on course

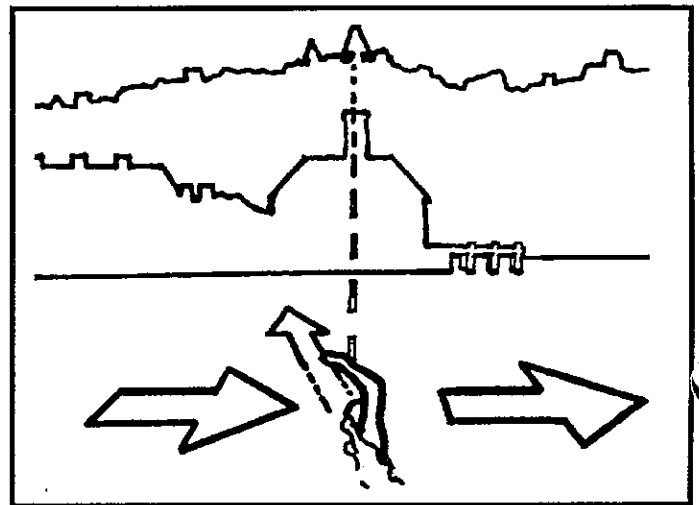
You can waste a lot of time and swim a lot further than necessary if you don't follow the shortest distance to the finish. However, swimming with your head raised, so that you can see where you are going, makes your legs sink and slows you down. You can solve both of these problems using the following technique. Once the mad rush of the start is over, make sure you are headed in the correct direction and then choose some conspicuous distant object (eg. a hill, tall building or tree) at right angles to your course, preferably on the side you breathe (see Sketch 1). Once you have chosen an object you should see it each time you breathe if you are swimming straight. In big waves you might only see it once every two or three breaths but at least you can concentrate on swimming hard and you only need to lift your head and look ahead once every minute or so. It is best to choose an object as far away as possible. If you use a nearby object (like a boat on a mooring), there is a danger that you will swim in an arc round the object.



Sketch No. 1

Cross tides and currents

In some swims you will be swimming across a tidal harbour and will need to check to make sure you are not being swept away down tide. The easiest way of doing this is to choose a transit (two conspicuous objects in line) right ahead. In the case of the Chelsea swim in Auckland, the Chelsea Sugar Company (the regular sponsor of the race) has obligingly built a tall chimney in line with a Norfolk Pine on the hill above. During the swim an occasional glance ahead will make sure you are on track. If the two objects begin to separate you know you are being pushed sideways and can make a small correction to compensate (see Sketch 2).



Sketch No. 2

Accompanied Swims

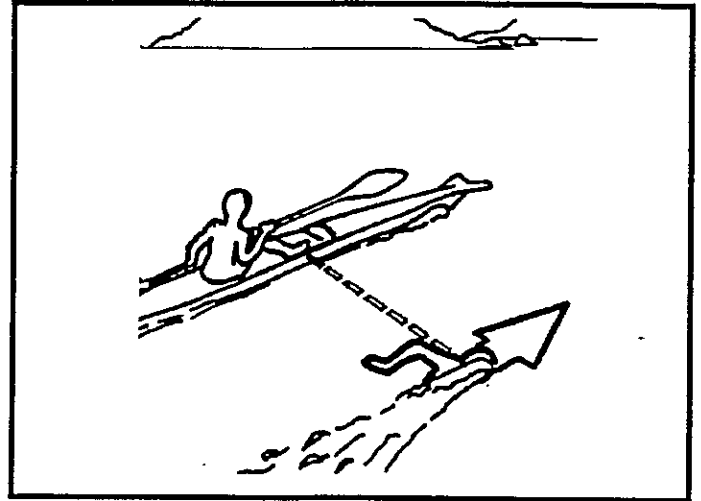
In the longer open water swims, our rules require each swimmer to be accompanied by a boat, surf ski or canoe. It pays to have a word with your boat persons before the start and arrange for them to do your navigation for you. The boat is higher in the water than you are and they can see ahead much better than you can. You will have to explain where you want to be at each stage of the swim because you might want to cut a corner at one stage or be out in the middle of the stream to make the most of the tide in another part of the race. Get them to stay alongside you on the side you normally breathe - but not too close or they cause drag and slow you down. About four metres is ideal. From this position they can control the direction of your swim by moving a little ahead or dropping back a bit. For example, if the boat is on your left side, then moving ahead slightly will turn you to the right (see Sketch 3). This leaves you to get on with the swimming, you just keep the boat in your vision each time you breathe. In fact you won't even be aware of changes in course. It takes a lot of concentration to swim hard and well and the less external factors you have to worry about the better.

Remember that if your accompanying boat is capable of displaying a flag then the international code flag "A" (the blue and white divers flag) should be flown to warn approaching boats of a swimmer in the water. Local rules require boats to keep their speed to 5 knots or less when within 30 metres of a swimmer.

Coping with cramp

Cold water often brings on leg cramps. You might be able to keep going and "swim through" the cramp but if it persists or gets worse, it is best to leave the water. All you have to do is stop swimming and raise one arm until one of the accompanying boats sees you. While you are waiting for help try to keep the leg extended with the foot turned up so that the muscles are stretched.

Stomach cramp is much more serious and you should always stop if you feel it coming on. It helps if you avoid eating large meals just before a swim. It is responsible and sensible to leave the water if you are not feeling well. There is always another swim on another day and after all, this is meant to be fun isn't it?



Sketch No. 3



Graham Middleton during his record-breaking swim

River swim epic now a book

By SEAN WHITTINGTON
KEEPING his word has always been paramount in the life and times of Graham Middleton.

Whether it be a crucial business deal or a personal pledge between friends, the retired car dealer has always been the sort of bloke to honor a promise.

If any proof were needed Graham, at 56, swam the length of the River Murray — all 2366.3km — to keep a promise he had made 15 years earlier.

The incredible feat has been listed in the Guinness Book of Records, and must surely rate as one of the greatest sporting

achievements in Australia's history. As former world boxing champion Jeff Fenech said: "Tough times don't last. Tough people do. Graham has proved himself a very special athlete. He went the distance."

For the statistically-minded, Graham swam breast-stroke the entire length of Australia's greatest river in 800 hours and nine minutes.

On average he swam six hours a day, seven days a week, for 138 consecutive days from November 30, 1981 to April 15, 1992.

Along the way he had to cope with the odd irritated snake,

treacherous rapids, headwinds, houseboats, hundreds of snags, rubbish...you name it.

But by far his greatest challenge was his lone physical fight against the bitter cold.

Three years on, Graham still struggles to remember those hard times when his inner strength and human endurance were put to the extreme test. If not for the journals he kept of his record-breaking achievement, some details might have been lost forever.

At the insistence of a friend, Graham kept a daily log of the marathon swim — writing

about the good and bad times, the emotional and physical hardships, the milestones.

Only now has the journal been transformed into a book, aptly titled, *Beyond Endurance — One Man's Quest To Swim Australia's Greatest River*.

Promotions since Graham's feat have raised more than \$160,000, for child cancer research, and proceeds from his book will be divided between that fund and the Australian Rotary Health Fund.

● Buy the book for \$19.95, plus delivery, from the Anti-Cancer Council of Victoria, or from Graham, PO Box 143, Corryong, Victoria, 3707.

TAILORING A PROGRAMME

A COACHING SEMINAR WITH ANITA KILLMIER

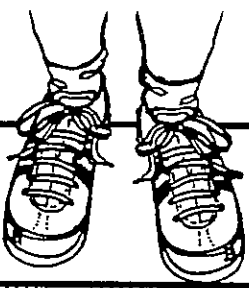
A transcript of this 2 day seminar conducted by AUSSI Tasmania is now available in booklet form to all members. Cost is \$5.00 which includes postage and all monies go directly to purchase more videos for the AUSSI Resource Centre.

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.

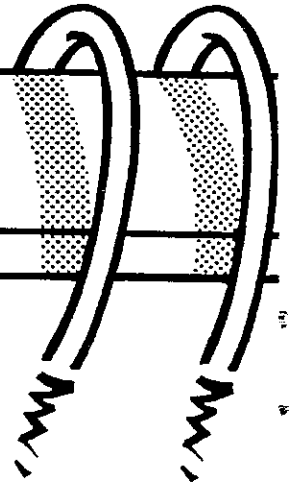
To purchase your copy just write to the address on the last page of this newsletter.

Don't forget all AUSSI members now compete as the age they will be on the 31st December 1995. Please ensure all meet entries are filled in accordingly.



TRAINING and COACHING the I.M.

By GEORGE E. BOLE



Perhaps the most exciting, interesting and, for the competitor, demanding event in the swimming programme is the Individual Medley. With all four strokes involved and all five sources of energy used, training and coaching the medley is somewhat specialist in nature.

Yet for all its glamour and all the efficiency demanded for its execution, very little has appeared in any of the accepted tomes on swimming. Doc Counsilman in "The Science of Swimming" (1968) devotes three chapters and two lines to pacing the I.M. plus five pages of training schedules out of 446 pages for our information on this "the most interesting of all competitive races". Derek Snelling, Calgary, Canadian Olympic Coach wrote a book "All About Individual Medley" based on his own very wide experiences. Don Talbot, in his "Swimming to Win for All Ages" wrote one chapter, "So You Want to be a Medley Swimmer" and, incidentally stated what I believe to be true, that the back-stroke leg is the strong point of the event.

More recently, Ernie Maglischo, in his wonderful book, "Swimming Faster" could only furnish us with three paragraphs on the I.M. and its training needs. In my research, I found one or two articles contributed to aspects of this event. So, all in all, it seems that little research has been done for the improvement of the I.M., or if it has been done extensively, then it's a well kept secret.

After the Montreal Olympics I proceeded to attempt to analyse the results of the Medley-the 400, as the 200 was not swum then. My study was to find out and establish a percentage breakdown of the time spent on each stroke. Using both the men's and women's splits for the finals, and averaging the percentage of the total time for each stroke, I arrived at the following conclusion. For all good Medleyists, 22.4% of the overall time was spent on the butterfly, 25.5% on the back-stroke, 29.5% on breast-stroke, and 22.6% free-style. The gold medallist for women, G.D.R.'s Ulricke Tauber split 22.5%, 25.3%, 29.2% and 22.9%, and Australia's Gail Neall won the Olympic 400 I.M. at Munich with a 22.6%, 25.6%, 29.7% and 22.2%. To add a topical note Tomas Daruyi of Hungary in his 200 world record I.M. in Seoul returned figures to record 22.4, 25.5, 29.5, and 22.6 percentages.

So, now, to develop the I.M. swimmer's programme, I am able to determine from an expected total time, how he should split his strokes. For instance if I am hoping for a 5 mins.00 sec. total time, then using the percentages, I want him or her to swim 67.2 secs Fly, 1 min 16.5 sec Back, 1 m 28.5 secs Breast, and 1 min 7.8 secs Free-style. Now these figures are but guidance control, but from the analyses made, the swimmer should be near.

At least, if he splits differently, he will have an idea where improvement should be made.

Medley swimming is one of the great conditioners in most successful coaches programmes. Bud McAlister, Janet Evan's coach testifies to this as one of the reasons for his great protegee's performances. Most of us use medley work, if only for variety but I believe that to be successful in the event it must be treated as that, an event, in itself. It should not be treated as a pot-pourri of strokes, but as a complete entity, and so training for the I.M. must have that aspect in mind. From a survey I made of how the best British and European coaches approached the training for medley I had as many different schemes as individuals. Some used a different stroke each day, others combined two strokes per day, while many trained several days per each stroke.

My own approach was, and still is, that if I am to treat the event as an entity then I must work on it that way. For instance a complete medley work-out could be;

Warm up;	100 Fly + 75 Bk, + 50 Br, + 25 F/S)	with 10 sec after ea 250
	75 Fly + 50 Bk, + 25 Br, + 100 F/S)	
	50 Fly + 25 Bk, + 100 Br + 75 F/S)	
	25 Fly + 100 Bk, + 75 Br + 50 F/S)	

Kick; 4 x 75 I.M., 4 x 50 I.M., 4 x 25 I.M.

Pull; 8x (4x25 I.M.) with 10 secs

Swim; 4 x 50 I.M. straight + 4 x 50 I.M. reversed,
breathing 3 on Fly, 4 on Bk, every 6 strokes
under water for Breast, and every 5 breathing
Free-style, (Hypoxic work)

Series; 4 x (4 x 50 I.M. + 50 Fly) on as reqd.
4 x (4 x 50 I.M. + 50 Bk) on " "
4 x (4 x 50 I.M. + 50 Br) on " "
4 x (4 x 50 I.M. + 50 F/S) on " "

Sprint; 16 x 25, 4 each stroke every 25 sec or 30 sec or
whatever.

Cool Down; Drill 400 I.M.

There are infinite variations on this theme, but the swimmer is in no doubt he is training medley.

Obviously, this would not be a daily regimen, but sections of medley work should be a part of every work-out. And the reason for working the event as a whole or with two or more strokes tied is to familiarize the swimmer with (1) the changes in body positions and (2) the need to tie-up the strokes.

This article appeared in part, in one of the first editions of this newsletter. George Bole then presented this paper at the World Masters Swimming Games in Brisbane, in 1988. I have decided to reprint the paper in its entirety due to the lack of information, in general, on coaching the Individual Medley.

From my questions to coaches as to the most important requirement for a medley swimmer, the most repeated answer was the "ability to tie the strokes together". My observations led me to believe that there as a question of balance involved in the changes from face down Fly, to upside down on Back, change again to Breast-stroke and face down again to Free-style. After watching all over Europe and Great Britain, it was apparent that after completing each stroke swimmers tended to slow down for the first few strokes of the new leg. So the more often the swimmers accustom themselves to the changes the better would be their performances.

Further examination of the results of the world champion medleyists provided the interesting fact that the free-style legs compared favourably with the last 100's of the 400 Free-style swimmers. This fact convinces me that good I.M.er's must have high endurance quality and so need some training for the middle distance free style event.

Flip Dan, coach to many great Medleyists, made the point that he like his swimmers to hit the Fly and Free style legs at similar times--borne out by the percentage figures. To do so demands the performer to rate high on endurance.

If I want to improve one of the strokes in the medley, then, adhering to the theory that the event be treated as an entity, I would concentrate on the weak stroke within the context of the medley viz; to improve the backstroke, I would swim sets of 25 Fly + 100 Bk +25 Br - maintaining the prone-supine-prone formation. Similarly breaststroke would be 25 Back, + 100 Br + 25 F/S...again keeping the pressure on the weakness and holding the body changes.

Pacing the I.M. is not easy for the uninitiated, but if we examine the energy sources used we might have some ideas. The start of the race, Fly, see the energy coming largely from anaerobic sources for the first two minutes of the event. Lactic acid produced causes the lowering of the P H which is one of the stimulants of the increased respiration. Once respiration increases, aerobic energy sources become available and a steady state is reached. This is different for each swimmer. In this steady state of swimming the performers usually try to save some anerobic energy to bring it home.

Thus the Fly leg utilises anerobic energy., 85%, 15%; the Back stroke (with the effects of easier respiration), using 50%, 50%, the Breast-stroke becomes the steady state, 70%-30% , and the Freestyle, bringing it home, returns to the anerobic sources. The importance of a really good back-stroke is obvious--most I.M.'s are outstanding on the dorsal event.

Our medley prospect would then be specific in his training all four strokes as much as possible, develop a good back-stroke, have a reasonably good 400 Free-style with endurance high.

To swim the I.M. the best instruction I give is to swim the Fly knowing that there are three more legs to follow, push

hard on the back-stroke, pull wide arms on breaststroke, using triceps to save the biceps for the free-style leg which should be a determined effort to round off the race.

Finally, if there is one weak stroke in the four, I would advise the competitor not to work that particular stroke too hard in the race. That way means waste of useful energy needed to strengthen the effort on the other strokes. Swim the weak stroke with the best form possible and try to compensate on the good strokes.

Remember the percentages 22.4, 25.5, 29.5, 22.6 for the respective strokes, good turns to link up the event, middle distance pacing ability, a good back-stroke, and Fly and Free-style similar times. The rules are the same for age-group through to Masters.

THE COMMITTEE

Oh, give me some pity, I'm on a committee,
Which means that from morning to night,
We attend and amend, and contend and defend,
Without a conclusion in sight.

We confer and concur, we defer and demur,
And reiterate all of our thoughts.
We revise the agenda with frequent addenda,
And consider a load of reports.

We compose and propose, we suppose and oppose,
And the points of procedure are fun.
But though various notions are brought up as motions,
There's terribly little gets done

We resolve and absolve, but we never dissolve,
Since it's out of the question for us.
What shattering pity to end our committee,
Where else would we make such a fuss!

Don't forget to check your sticky label on your envelope to find out when your subscription is due.

Changes for Sheffield

At the FINA Bureau Meeting, held in Rome 28 August, approval was given to measures to reduce the programme for the VI World Masters Swimming Championships to be held in Sheffield 22 June to 2 July 1996.

In making recommendations for the changes, The FINA Masters Committee faced the difficult task of making a substantial reduction in the running time of the swimming programme without encroaching on the basic Masters concept that the World Championship should be open to all registered Masters wishing to participate. The next World Championships is to be held for the first time in Europe and it is anticipated that there will be large entries. It was imperative that effective measures be taken to ensure that the excessively long daily programme of Swimming events experienced in Montreal be reduced to allow all those attending, including the overworked officials, to participate in at least some of the "Fun and Friendship" aspects of Masters Swimming.

The changes approved were as follows:

- ☐ The current programme for swimming events is to be extended from six days to seven.
- ☐ The 400m Freestyle and the mixed 200m Medley Relay events are to be eliminated from the programme.
- ☐ Qualifying standards for the 400m Individual Medley and the 800m Freestyle events will be introduced. The standards will be based on established world records plus a margin of 40%. No medals will be awarded to those who do not meet their qualifying times and the referee will have the authority to withdraw a competitor who is excessively delaying the meet.
- ☐ Competitors may compete in five individual events plus relays but will be restricted to one individual event per day.

It is hoped that, by adopting these measures, each day's programme will be able to be completed by 5-30pm and that the evenings will be free for all to enjoy. The changes are not necessarily permanent and, should numbers attending World Championships show evidence of a decline, the situation will be reviewed.



SOME POINTERS FOR YOUR SUMMER SEASON

I am often asked questions by masters regarding training, such as how much should I do each day, how many sessions a week should I do, how hard should I train, how should I taper etc. etc. Answers to such questions are not always easy as it depends so much on the age of the swimmer, the training situation such as whether or not they are training with a group and of course what events they are training for. The interesting thing is that apart from a few exceptions, not many masters are specialists in any one stroke or distance and it is most likely that in a week-end meet a swimmer will compete in several freestyle events from 50 to 1500. As well as this they will often throw in a medley and a couple of form stroke events. Such a programme is fairly taxing and often does not produce the best results in all entered events. However on the other hand master swimming is really all about participation and fun, as well as competing seriously.

" I personally believe that weight training is not really necessary for master swimmers. "

There are a number of factors which must be considered when setting up a training programme and some of these affect everyone whether they are elite swimmers or masters. The main things which affect how fast we swim any race are Efficiency, Drag, Speed and Endurance. In a season of training, a swimmer must consider all of these factors throughout the season. So it is therefore important that we understand the meaning of these terms.

Efficiency: This refers to the stroke technique, how well the stroke is performed. No

amount of training will improve a swimmer if the stroke technique is faulty. It is important therefore that the swimmer spends time on occasions on stroke drills to improve technique. With the changes that have been made recently in the technical strokes such as breaststroke and backstroke it is important that swimmers learn some drills which will help in the development of these strokes. These drills should be practised in one or two practices each week.

Drag: This simply refers to body shape and streamlining and is obviously something that a number of older swimmers have a problem with as a normal process of aging. Again this can be controlled by attention to proper diet particularly controlling the intake of saturated fats. Remember that efficient stroking will get you through the water much faster only if there is less drag. This drag is caused by excess body weight which places more stress on the energy systems used to get you through the water at a pace which will allow you to get to the finish before anyone else.

" The interesting thing is that many master swimmers are more motivated than a lot of young competitive swimmers and there is the possibility that they will over train. "

Speed: This seems obvious. However it is surprising how many master swimmers do not pay much attention to this facet of training. It is particularly important with regard to the point already made regarding the range of events that masters are inclined to include in a meet programme. What must be remembered is that to swim the distance events one must have great endurance and for the shorter events speed is essential.

However the days when distance events were only swum by those individuals who could not do well in the shorter events are long gone. Today the distance swimmer must have speed. The way you split

each hundred of the 1500 is based on your ability to swim one hundred. The better your basic speed is the better you will swim the 1500 provided however you do the amount of work required for this event. Sprints in training can be very tiring and can leave the swimmer with very sore muscles which can be felt the next day. It is important therefore not to sprint too much every day. Also sprints should only be over a short distance of 20 to 25 metres maximum.

Endurance: Endurance will be achieved by swimming at lower intensity at the aerobic level where the lactate level in the muscles is not high enough to cause fatigue. A higher level of endurance can be achieved by repeating shorter swims at a higher speed with a short rest. This increases the body's ability to absorb oxygen. The term used to refer to this is Vo_2 max. and is an essential factor in training the energy systems required for the distance events. In this type of training the swimmer trains at a higher heart rate than when doing a slower longer swim. A word of caution here however. Older swimmers should be careful not to swim at a rate which will put their heart rate up too high as this could be risky. What must be remembered is that maximum heart rate decreases with age. it is not uncommon for a person to have a maximum heart rate of more than 200 beats per minute in their youth but people in their 50s and 60s will rarely have maximum heart rates of anywhere near this figure. A general average would be no more than 170 for this age group. It would be unwise therefore for this

swimmer to train at anything higher than about 140 in repeat training. I would also strongly advise anyone who is new to training at middle age or over should consult their doctor for a thorough physical check and if possible have an ECG stress test which will show any abnormalities in the

electrical impulses from the heart which will not show up during an ECG taken at rest. I do not mention this to scare anyone but I do believe that if a person has any concerns about their health they should be careful to what extent they push themselves. The interesting thing is that many master swimmers are more motivated than a lot of young competitive swimmers and there is the possibility that they will over train.

I am often asked about weight training. I personally believe that weight training is not really necessary for master swimmers. If the person feels a need for something extra, some work with stretch cords could be done. These tend to simulate the stroke movement and also develop some strength and muscle tone. Incidentally, Keiren Perkins who won the Olympic 1500 in Barcelona in World record time does no weight training but does a work-out with stretch cords before each training session for 30 minutes, he also does sit ups for the abdominals and spends 20 minutes on an exercise cycle daily.

In my next article I will deal with stroke drills and also tapering for events. Good luck with your training for the coming Summer season and remember "Get that urge to WIN, there is no time to LOSE."



Summary FINA Masters World Records - Dated 1st November 1994



Long Course



Long Course



Short Course



Short Course

		25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-99	100-104
50m	Free	00:26:68	00:26:37	00:26:69	00:28:05	00:29:08	00:29:33	00:32:59	00:33:11	00:34:75	00:37:58	00:40:85	00:42:74	00:50:93	02:02:38		
100m	Free	00:58:23	00:58:09	00:58:94	01:01:41	01:05:44	01:07:42	01:11:01	01:14:25	01:16:84	01:26:65	01:38:28	01:39:30	02:03:90	04:08:22		
200m	Free	02:07:11	02:07:84	02:08:93	02:14:97	02:24:24	02:29:22	02:36:58	02:43:83	02:48:51	03:13:62	03:37:64	03:44:00	04:45:10	07:28:92		
400m	Free	04:27:53	04:30:38	04:31:35	04:48:82	04:59:86	05:16:62	05:28:57	05:47:52	06:05:22	06:46:55	07:38:77	08:23:50	10:44:25			
800m	Free	09:18:43	09:16:82	09:20:62	09:57:69	10:20:95	10:58:47	11:30:97	12:01:79	12:27:60	13:51:53	15:41:45	17:21:19	24:23:38	30:55:09		
1500m	Free	17:38:78	17:40:50	17:59:12	18:00:40	19:28:34	21:02:46	22:18:91	23:17:39	24:07:05	27:05:80	29:45:90	33:43:00	52:15:77			
50m	Back	00:30:80	00:31:47	00:32:39	00:32:25	00:34:51	00:34:87	00:37:30	00:40:35	00:39:85	00:44:53	00:46:64	00:53:73	00:58:42	01:42:49		
100m	Back	01:06:46	01:07:13	01:08:49	01:11:03	01:17:06	01:19:45	01:21:42	01:30:22	01:31:58	01:39:85	01:49:73	02:01:87	02:13:13	03:59:89		
200m	Back	02:19:97	02:22:04	02:26:66	02:36:69	02:50:27	02:51:11	02:59:18	03:12:84	03:17:12	03:46:22	04:06:64	04:22:89	04:47:82	10:47:76		
50m	Breast	00:32:01	00:34:56	00:34:41	00:37:02	00:38:97	00:39:52	00:39:91	00:42:49	00:43:42	00:49:57	00:52:90	00:59:60	01:26:13			
100m	Breast	01:16:05	01:14:52	01:17:44	01:21:73	01:22:27	01:28:83	01:29:88	01:35:25	01:42:25	01:52:68	02:05:99	02:17:08	03:06:40			
200m	Breast	02:42:02	02:48:41	02:51:75	02:56:21	03:09:19	03:13:64	03:18:11	03:25:29	03:45:71	04:06:56	04:35:90	05:01:36	07:15:13			
50m	Fly	00:28:79	00:29:22	00:29:27	00:29:89	00:30:74	00:31:69	00:35:29	00:38:10	00:41:31	00:46:55	00:55:38	01:06:65	01:27:77	04:57:25		
100m	Fly	01:03:91	01:06:08	01:05:39	01:06:27	01:12:67	01:13:86	01:27:49	01:31:52	01:38:33	02:02:61	02:19:44	02:27:91	03:01:14			
200m	Fly	02:18:69	02:27:43	02:26:38	02:33:51	02:38:78	02:49:53	03:17:68	03:27:54	03:36:25	04:37:05	04:54:79	05:24:52	07:18:41			
200m	Med	02:22:00	02:27:66	02:28:93	02:38:20	02:46:91	02:54:57	03:04:30	03:15:30	03:20:58	03:51:91	04:20:42	04:47:02	06:44:53	12:10:93		
400m	Med	05:05:29	05:08:67	05:34:47	05:39:70	05:54:98	06:12:08	06:18:94	06:57:33	07:09:69	08:33:57	09:11:23	10:05:13	14:02:65			
50m	Free	00:22:59	00:23:21	00:23:20	00:24:93	00:25:18	00:26:16	00:27:05	00:27:86	00:28:94	00:29:35	00:32:50	00:33:88	00:41:53	00:49:51		
100m	Free	00:51:25	00:51:50	00:52:13	00:55:26	00:55:66	00:58:62	01:01:13	01:02:80	01:08:15	01:11:61	01:14:86	01:22:50	01:41:27	01:57:91		
200m	Free	01:52:17	01:54:04	01:55:36	02:03:28	02:04:97	02:09:74	02:17:63	02:23:11	02:32:90	02:44:86	02:53:73	03:17:67	03:48:91	04:28:34		
400m	Free	04:05:59	04:07:04	04:12:95	04:24:26	04:27:70	04:43:72	04:57:21	05:05:54	05:38:79	05:57:45	06:20:87	06:54:60	08:14:50	09:44:11		
800m	Free	08:29:22	08:40:19	08:52:22	09:19:34	09:24:19	09:49:89	10:27:08	10:36:08	11:35:97	12:34:22	13:07:66	13:50:05	17:11:21	20:13:74		
1500m	Free	16:28:69	16:36:06	17:11:82	17:30:13	18:27:49	18:49:43	19:54:72	20:06:80	22:29:32	23:59:01	25:41:55	28:54:95	33:08:42	36:47:02		
50m	Back	00:27:39	00:27:26	00:28:04	00:29:38	00:30:42	00:30:93	00:32:94	00:33:13	00:35:47	00:37:35	00:39:49	00:45:69	00:58:07	01:10:27		
100m	Back	00:58:24	00:58:66	01:00:95	01:03:39	01:06:00	01:09:82	01:13:15	01:14:72	01:20:74	01:25:35	01:30:11	01:45:37	02:07:06	02:56:58		
200m	Back	02:07:57	02:05:62	02:13:83	02:18:17	02:26:69	02:32:81	02:37:16	02:45:93	02:56:46	03:13:25	03:15:43	03:47:46	04:43:49	07:16:52		
50m	Breast	00:29:77	00:29:42	00:30:79	00:30:82	00:32:46	00:33:38	00:33:03	00:35:91	00:38:28	00:40:56	00:42:58	00:46:59	00:57:92	01:18:31		
100m	Breast	01:04:60	01:05:65	01:07:90	01:09:35	01:12:96	01:15:60	01:17:87	01:21:58	01:28:91	01:33:20	01:37:55	01:51:25	02:18:92	03:09:64		
200m	Breast	02:26:73	02:24:08	02:33:05	02:32:17	02:41:02	02:50:57	02:56:20	03:06:65	03:16:90	03:32:90	03:34:86	04:17:62	05:09:86	06:24:54		
50m	Fly	00:25:16	00:25:31	00:25:93	00:26:66	00:27:12	00:28:19	00:29:74	00:31:39	00:33:34	00:35:65	00:37:57	00:49:28	00:59:50			
100m	Fly	00:56:34	00:56:64	00:57:39	00:59:66	01:02:84	01:05:83	01:09:27	01:14:98	01:20:59	01:32:85	01:39:80	01:58:99	02:33:63			
200m	Fly	02:05:25	02:07:43	02:08:51	02:20:81	02:25:23	02:32:65	02:48:05	03:00:99	03:08:79	03:38:48	03:43:56	04:31:96	05:24:28			
200m	Med	02:07:00	02:09:69	02:15:21	02:18:92	02:24:39	02:28:70	02:41:23	02:50:08	02:57:61	03:11:42	03:24:88	04:01:29	04:40:15			
400m	Med	04:31:47	04:40:22	04:50:18	04:57:46	05:12:03	05:25:32	05:45:82	06:04:99	06:25:02	06:59:24	07:22:43	08:45:17	10:28:43			
50m	Free	00:26:65	00:26:46	00:26:24	00:27:76	00:29:73	00:30:48	00:31:83	00:33:54	00:34:38	00:37:53	00:42:50	00:45:40	01:03:78	01:36:77		
100m	Free	00:58:93	00:57:35	00:58:39	01:00:68	01:05:20	01:06:41	01:11:63	01:13:68	01:20:80	01:29:76	01:38:34	01:48:30	03:01:15	03:24:13		
200m	Free	02:05:80	02:06:83	02:12:69	02:14:32	02:28:68	02:27:95	02:34:77	02:39:92	03:02:54	03:18:51	03:33:90	04:07:63	05:33:83	07:01:11		
400m	Free	04:25:94	04:30:59	04:46:93	04:50:68	05:12:72	05:12:43	05:34:32	05:38:06	06:13:42	06:54:54	07:23:23	08:48:24	14:16:35			
800m	Free	09:18:99	09:09:90	09:46:95	10:04:16	10:51:52	11:20:21	11:29:99	11:30:55	12:35:26	14:29:66	15:28:60	18:11:90	24:05:34	28:45:45		
1500m	Free	17:30:18	17:41:61	18:27:71	19:00:81	21:16:14	21:44:35	21:35:84	23:28:15	23:38:44	28:28:85	29:30:20	35:07:31				
50m	Back	00:30:63	00:31:76	00:32:50	00:31:55	00:35:30	00:35:96	00:37:10	00:39:60	00:40:48	00:45:08	00:48:06	00:58:78	01:13:57	01:55:07		
100m	Back	01:04:66	01:06:69	01:10:47	01:10:94	01:16:29	01:19:17	01:21:90	01:29:13	01:30:41	01:44:02	01:48:13	02:06:95	02:52:17	04:19:46		
200m	Back	02:17:86	02:24:16	02:31:78	02:38:22	02:45:58	02:48:88	03:00:66	03:16:14	03:15:72	03:52:20	04:00:43	04:38:53	06:00:16			
50m	Breast	00:33:60	00:33:74	00:34:63	00:37:64	00:37:54	00:38:82	00:40:69	00:42:02	00:44:61	00:49:15	00:53:94	01:05:64	01:25:54	01:49:01		
100m	Breast	01:13:60	01:15:39	01:16:70	01:22:19	01:23:49	01:25:73	01:28:13	01:32:12	01:41:68	01:50:57	02:00:27	02:19:17	03:09:62	04:05:59		
200m	Breast	02:40:90	02:49:16	02:50:93	02:54:12	03:04:75	03:06:83	03:12:85	03:19:67	03:48:02	03:55:30	04:32:71	04:54:39				
50m	Fly	00:29:37	00:29:63	00:30:05	00:30:18	00:32:97	00:34:93	00:36:10	00:38:40	00:42:27	00:48:27	00:56:53	01:05:04	01:24:53			
100m	Fly	01:05:71	01:04:69	01:07:28	01:06:66	01:12:53	01:12:66	01:26:31	01:29:99	01:38:32	01:57:43	02:12:17	02:30:84	03:29:58			
200m	Fly	02:17:13	02:26:35	02:28:96	02:29:19	02:37:88	03:11:83	03:11:42	03:17:00	03:36:36	04:17:53	04:48:50	05:22:65	07:15:07			
100m	Med	01:06:84	01:07:78	0													

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 hiring charges:

1 Video	1 Week \$5	2 Weeks \$8
2 Videos.	1 Week \$8	2 Weeks \$12
3 Videos.	1 Week \$10	2 Weeks \$15
1 Audio Tape.	1 Week \$3	2 Weeks \$5
2 Audio Tapes	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
- * Mark Tonelli tapes
- * Aussi Coaching Seminar with Kirk Marks
- * THE ATHLETIC INSTITUTE SWIMMING SERIES
 1. Freestyle & Backstroke
 2. Breaststroke & Butterfly
 3. Starts, Turns & Progressive Drills
- * AUSSI WORKSHOP - Tailoring a Programme plus booklet
- * Stretching - Bob Anderson
- * Food for Sport
- * Masterstroke Technique
- * Your Backyard Swimming Pool is your home fitness centre
- * AUSKA - Swimming Strokes
- * SWIM SMARTER, SWIM FASTER AND
- * STARTS, TURNS AND FINISHES
- * Masters Stroke Techniques
- * Swimming Fastest
- * A.S.C.A. Conference MASTERS Adelaide 92
- * Strength Training
- * Visualisation
- * Media Matters
- * Exercise beats Arthritis

AUDIO TAPES

- * THE CREATIVE PERFORMANCE INSTITUTE
 1. Guided Imagery for Racing Risk Taking & Racing
 2. Guided Imagery for Training Commitment & Training Today Relaxation and Mental Rehearsal
- * 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 Crouch
 4. Blood Lactate Responses in Masters Swimmers During Active and Passive Recovery - Peter Reaburn
 5. Utilisation of Time and Space for Swimming and Dryland Training - Dick Shoulberg
 6. Physiological Considerations in Tapering Swimmers - David Pyne
 7. Coaching Butterfliers - Doug Frost
 8. Training and Racing the Individual Medley - Dick Shoulberg
 9. The Importance of Teaching Good Technique - Laurie Lawrence
 10. The AUSTSWIM Swimming Program - John Kilpatrick
 11. Long Distance Swimming Training - Dick Campion
 12. High Altitude Training - Ian Findlay
 13. Coaching the Elite Distance Swimmer - Ian Findlay

AUSSI RESOURCE CENTRE - ORDER FORM

NAME _____
 ADDRESS _____
 AUSSIE CLUB _____
 MEMBERSHIP NO. _____

I REQUEST THE HIRE OF THE FOLLOWING ITEMS

1. _____
2. _____
3. _____

I WOULD LIKE TO HIRE THEM FOR A TOTAL OF _____ WKS COMMENCING _____ DATE

I AGREE TO RETURN THEM IN GOOD ORDER
 COMPLETE WITH MY CHEQUE FOR HIRE AND
 POSTAGE

SIGNED _____
 DATE _____

CHEQUES MUST BE MADE TO "AUSSI"
 27 Johnstone Street,
 MALVERN 3144

Memorabilia

Has any body found or kept early AUSSI memorabilia that is unwanted. By this I mean old award patches for the distance achievements, old ribbons ect. If you have and would like to help out would you please send them to the National Office so they may be sent to the keeper of our archives

COACHES INDEMNITY INSURANCE

Its that time of the year when everything seems to be upon us. The present Coaches Indemnity Insurance arrangement that AUSSI has with IEA expire on the 31st December 1994

We have however, renewed the policy for 1995 with no increase in the premium. the terms and conditions will remain the same as is was for this year

**ALL AUSSI COACHES TO MAINTAIN THEIR INDEMNITY COVER,
NEED TO RENEW THEIR INSURANCE THIS MONTH.**

The policy will commence on January 1 1995 and we ask you to send a cheque for \$30.00 made payable to:

**AUSSI MASTERS SWIMMING
P.O Box 207
Cowandilla S.A 5033.**

**PLEASE NOTE: PERSONS CURRENTLY HOLDING LEVEL 1 OR LEVEL 1M
COACHES ACCREDITATIONS MAY APPLY DIRECT. NON
ACCREDITED CLUB COACHES OR ASSISTANT COACHES MUST
APPLY THROUGH THEIR CLUB, AND THE CLUB MUST
PROVIDE A STATEMENT THAT THE PERSON IS ACTIVE IN
CLUB COACHING.**

Yes, I wish to join the coaches indemnity policy for 1995, and am enclosing my cheque for \$30.00

NAME: _____ Please Print

ADDRESS: _____

CLUB STATEMENT: _____ if applicable

SIGNED: _____

AUSTRALIAN MASTERS SWIMMING COACHES NEWSLETTER

AUSTRALIAN SUBSCRIBERS \$16.00 / 4 issues

OVERSEAS SUBSCRIBERS \$24.00 / 4 issues (Bank Draft Only)

Please send me one year's subscription of the AUSTRALIAN MASTERS SWIMMING COACHES NEWSLETTER.

NAME:

ADDRESS:

.

. POSTCODE

PLEASE TICK: ☐ SUBSCRIPTION RENEWAL ☐ NEW SUBSCRIPTION

PLEASE DETACH AND SEND THE WHOLE PAGE

CHEQUES TO BE MADE PAYABLE TO:

"AUSSI"

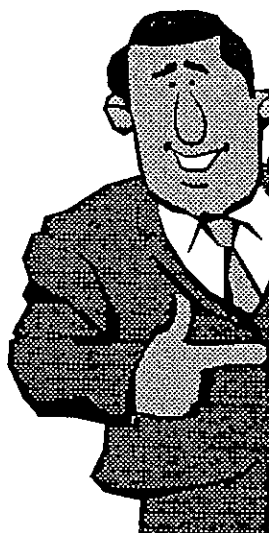
C/- Australian Masters Swimming Coaches Newsletter
27 Johnstone Street,
MALVERN VIC 3144
AUSTRALIA

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Mastering Swimming
A Self-Help Guide for Coaches
and Swimmers
Anita Killmier (Editor)
Mastering Swimming is a book for
anyone who wants to know more
about swimming – coaches, swimmers
and teachers alike. It is for both young
and old; those who train in a group
and those who train alone; those who
are experienced swimmers and those
who are just starting out; but most
importantly it is for those who want to
gain more from their chosen sport –
swimming.
RRP \$26.95

AUSTRALIAN MASTERS SWIMMING COACHES NEWSLETTER

**WANTED : CONTRIBUTIONS SUCH AS
LETTERS, UP COMING EVENTS, CLUB
PROFILES, SAMPLE TRAINING SESSIONS.
DEADLINE FOR NEXT ISSUE : MAY 1ST**

Cheques + postage and handling to AUSSI c/o the above address.