INTENSIVE SWIMMING TRAINING OF THE YOUNG

J. M. HOGG, D.P.E.

Technical Director of Swimming for Scotland

Introduction

I most certainly welcome the opportunity to speak to this Conference on a topic that is both interesting and controversial. It will be difficult to co-ordinate the varying facts and opinions expressed by sports coaches, physiologists, physical educationists, psychologists, parents and the medical profession, primarily because we all view the subject from differing stand points.

I can only present facts and make comments along very general lines, substantiated in the first instance by my own coaching experience with the young and, secondly, by observation of a considerable number of competitors at varying levels. I am very conscious of the problems our young swimmers have to face, overcome or tolerate as a result of what can be described as the "tyranny of the record".

However, I would stress that I will be expressing my own personal views — thoughts that may well not be shared by other coaches.

Intensive Training of the Young:

The terms of the Conference with reference to swimming in particular, could be defined as follows:-

- "intensive training": one or two daily workouts of up to two or four hours duration, seven days a week for the most part of the year
- "young": children start training on a regular basis from 10 or 11 years onwards and phase out at varying ages, depending on commitments and success.

I believe that swimming is the only competitive sport that *intensively* trains the young in the strict sense. It does this to include relatively large numbers regularly and for a longer span of time than other sports.

If we want an accurate picture of what is meant by the young and the degree of training intensity they endure, then we should consider briefly Britain's position in relation to the world swimming scene. From fig. 1, which discloses approximate figures of some of

the world's swimming nations' competitive life span, we can conclude that British competitors tend to start training later and finish earlier while at the same time indulging in less training than other countries. Therefore, I question whether the training of British competitive swimmers can be referred to as *intensive* or actually pose similar problems to those experienced in countries like Australia and the United States.

In America, the world's leading swimming nation, children learn to swim at a very early age. In many parts of America, like Australia, the climate and the facilities encourage this. Children learn to swim between 2 months and 4 years, generally through the agency of private enterprise.

The Americans are naturally very competitive. The training and coaching of the young develops through the primary and secondary school structure under the direction of the physical education specialist. The High School, College and University structures of competitive swimming, stimulate a wide range of performers to pursue their sporting interests for as long as possible. The men remain longer in the sport to train and compete at a time when they are physically at their best. They can enjoy their success both as individuals or as part of a team. Because competitive swimming and its associated activities is recognised in American educational circles, facilities are excellent and readily available for exclusive use to young trainees at a convenient time to allow both regular training before and immediately after school. Coaching, for the most part, is the responsibility of the physical educationist. Most teachers and coaches ensure that there is no collision between swimming and educational commitments. A balanced physical, psychological and educational individual is highly desirable. In America and Australia swimming has become a way of life. Perhaps this is why the Americans appear to enjoy their swimming in larger units, where the success of one can be the success of all.

In Australia, the teaching and coaching of swimming is almost totally in the hands of private enterprise and is later developed through a limited number of highly competitive groups or clubs. The structure is demanding not only on the swimmer but also on the parents. Parents have to drive their children to the training pool at 5.30 a.m. each morning for the first of two or three daily workouts. There appears to be a selective creaming

Figure 1
"LIFE SPAN" OF COMPETITIVE SWIMMER: (AVERAGE) 1968-1972
Britain in Relation to the World's Leading Nations

off process, not only in terms of ability, but also in relation to swimming strokes and events. Only the good ones can survive the system. Yet Australia consistently produces world champions. Children are taught water **safety at a very early age**. There are well established **training systems in most major cities** to help improve swimming to a very high level.

However, there are limitations. Australia has no developed school, college or university framework that encourages swimming so the men, who wish to continue, have to do so in the States.

In Eastern European countries swimming is taken very seriously too. The structure is naturally state controlled and the school, college and university play a very significant role from the very beginning. There is a positive creaming off process on a large national scale and the specialists work hand in hand with the practical coach to research new and better ways of improving performances. The elite have added incentives insofar as they are state rewarded. Special schools for sport enthusiasts make it possible for aspirants to concentrate totally on their objective and with minimum interference. As a result they tend to stay in the sport a

little longer, precisely because of the cudos or the varying incentives regularly afforded in return for success. In Eastern Europe swimming is a serious business like any other sport. The German Democratic Republic is the biggest single threat to total American dominance[†]. Their determined approach to excel and win has rubbed off to some extent on their neighbours. West Germany especially is now beginning to emerge as a respectable and well organised swimming nation.

In Britain, only now are children beginning to learn to swim relatively earlier. The teaching of the subject, which was veiled in myth and ignorance, has radically improved. More school pools are being constructed and public pools are attractively designed to invite interest and participation.

The swimming club is the main agency striving to develop a young swimmer's potential. Most swimming clubs leave much to be desired by way of organisation and coaching commitments. Generally, facilities are very restricted simply because too many negative clubs are all fighting for the use of the same facility. In some areas the picture is grim. But there are areas too where dedicated coaches have ensured a continual succession of

good performers. The biggest single problem is acquiring the use of a pool at a time that will allow a competitor

to regularly train with the minimum of pressures.

TABLE I

Approximate Training Statistics:

COUNTRY	Training Hours per Day	Number of Daily Sessions	Daily Total in Metres	Average Total per Week	Average Mileage per Year
AMERICA	5 hours	2 Sessions per day 6/7 days per week	15,000m.	110,000m.	2,000 miles
AUSTRALIA	4-5 Hours	2 Sessions per day 6/7 days per week	15,000m.	110,000m.	2,000 miles
EAST GERMANY	5-6 Hours	2 or 3 Sessions per day 6/7 days per week	14,000m.	100,000m.	2,000 miles
RUSSIA	5-6 Hours	2 or 3 Sessions per day 6/7 days per week	15,000m.	100,000m.	2,000 miles
NEW ZEALAND	4-5 Hours	2 Sessions per day 6/7 days per week	12,000m.	72,000m.	1,800 miles
HUNGARY	5 Hours	3 Sessions per day 4 days per week	20,000m.	80,000m.	1,800 miles
WEST GERMANY	3-4 Hours	2 Sessions per day 5/6 days per week	12,000m.	70,000m.	1,800 miles
GREAT BRITAIN	2-3 Hours	1 or 2 Sessions per day 6/7 days per week	6,000m.	38,000m.	1,000 miles

Most clubs are forced to operate late in the evening when the public sessions have ceased. There is little chance to cream off and often a swimmer survives despite

the existing system. The drop out is quite alarming and invariably this is not the direct result of the training intensity associated with competitive swimming but a

consequence of a haphazard and conflicting system that dissuades rather than encourages. Neither is it readily accepted that a young swimmer can be academically successful while still pursuing an intensive involvement in sport. Comparatively speaking the colleges and universities do little to foster or encourage swimming excellence at a time when physical success is much more likely. Consequently, it is fast becoming the trend in this country, as with West European countries in general, to seek swimming excellence amidst the academic and sporting atmosphere of an American university.

Intensity of training is obviously going to vary considerably from age to age, according to the stroke and event that one is training to specifically improve. It also depends on the facilities available. Table I illustrates some appropriate training statistics and shows the likely training commitment of the more determined swimmer in various countries.

Most swimming countries conduct two sessions per day. These are generally in the early morning, before school and immediately after school, and can total between 3 and 5 hours duration. The content and intensity of the work will fluctuate according to whether you are a sprint or distance swimmer. The time of year or season would be another controlling factor. Sessions can be very hard or alternatively, be lighter workouts. Occasionally the training programme is punctuated with a heavy stress session to build up one or other component of fitness. Sometimes a third session during the lunch period or in the school programme may be utilised. Also training workouts are scheduled 6 or 7 days of the week but depending on commitments, a swimmer may be allowed to miss one or two training sessions in the week. If a swimmer falls behind with his school work then he will be dissuaded from attending workouts until he is up to date on all commitments. It is worth noting that in Hungary training is only done on four days of the week. A hard stress session is followed by a day of rest. In Great Britain it is easy to see that when discussing intensity of training we are not really in the same class. Our swimming fortunes have slumped too since in 1960 when we were the world's 3rd swimming nation. In 1972 we were placed twelfth. *Facilities in Britain are not so readily available at a time when it is convenient for a school child to train.* It is often an endless struggle to obtain sufficient water time at the best time.

As far as the young are concerned, the strict regimen of training, though in a modified form, begins in most countries at a very early age. British children, however, commence serious training about the age of eleven or twelve years on average. Contrary to what some people think, nonetheless, a child does not simply thrash up and down a swimming pool endlessly or to the point of exhaustion. The coach is responsible for the training of

his swimmers... a task he is best accomplishing gradually and with individual care.

What does training involve? Fig. 2 expresses in simple terms the various components that the coach is concerned with in his training programme to achieve fitness. The main arena for training is naturally in the water but there are supplementary exercises and activities that can be done in the gymnasium, referred to as land conditioning. (Hogg – 1972 – 1.)

The coach recognises that specific skill, endurance, strength flexibility and will power are the main components of physical and psychological fitness and that they form the chain of success. The swimmer will only be as good as the weakest of these links.

The coach believes that no longer is he able to work by rule of thumb. To be effective, today's training must be based on sound physiological principles of conditioning, stimulate each individual to work regularly and purposefully, afford realistic challenges, be carefully planned and controlled to cater for all other existing commitments and be an enjoyable experience. A lot of the fun has disappeared from both training and competing.

It is the training programme that builds up the components of swimming fitness and this programme must be governed by principles of conditioning. Conditioning is best defined as the sum total of all the physiological, anatomical and psychological adaptations made by the organism to the stress of the training programme – Counsilman, 1968 (2).

We can briefly summarise these principles as follows – Mowerson, 1968 (3).

Principles of Progressive Overload:

The organisms of the body will function more efficiently when they are subjected to a progressive form of resistance which gradually demands harder work against increased resistances with each workout. The workload must obviously vary according to a swimmer's current state of fitness, age and ability and the degree of intensity must be carefully assessed by the coach.

Conditioning depends on the existence of progressive stress being incorporated into a properly designed training schedule.

Principle of Adaptation to Stress:

The anatomical, physiological and psychological systems of the body will gradually adapt to the progressive stress of the training schedule. This takes time since there are so many other factors involved –

Figure 2.

e.g. the stage reached in an individual swimmer's growth and development pattern, the regularity of training, the intensity and duration of each workout, and motivational techniques employed by the coach to sugar the natural pain associated with rigorous training.

However, soon the swimmer will be able to accept more work with greater effort. While adaptation is taking place the swimmer and coach must carefully control all contributing or detracting factors – food and diet, sleep and rest, etc. It is impossible to compete or train strenuously without a conditioning period and it is noticeable that performances appear to deteriorate during the time of adaptation rather than improve.

Principal of Specificity:

You only get what you train for! Though there may be some recognisable transfer of training, generally one

has to train at an event to be specifically successful at that event.

The rate of improvement is directly related to the intensity of training and not to the duration or number of training sessions undertaken each week. It's not how much you do but how you do it that is the important factor.

When aiming to build up the component of skill, the coach must spend a great deal of time working to improve the five fundamentals.

Teaching, coaching and developing the individual skills over shorter distances is the main approach for the young age group swimmer. In reference to Table I, there is obviously a phasing in of intensive work and similarly a phasing out, as the swimmer becomes more experienced and has a backlog of training behind him.

Figure 3.

Figure 4

Perhaps not enough time is spent on developing the necessary skilful water-manship to eradicate all stroke weaknesses to be followed by technique pressurisation work once the skills have been thoroughly learned. These two aspects should go hand in hand, and skills learning will always be an on-going process.

The teaching or coaching of skills is best done at the beginning of a training session when the swimmer is fresh and perhaps towards the conclusion of a workout when the swimmer is tired and is forced to concentrate.

For the young, all strokes along with their starts and turns, should be emphasised and the coach must be cautious not to tag a swimmer as a breaststroker or freestyler, etc., too early as is all too commonly done. Thought has to be given to both the late and early developer. Initial success or failure can be the root cause of premature drop outs. During all skills learning, thinking and concentration should be stressed so that the swimmer is in complete control of their bodily movements through the water, especially when the longer distances or repeat swims are part of the training

programme. For success, it is essential that the coach is an effective and knowledgeable teacher with a complete understanding of a child's mental and physical make up at every stage of their development.

Endurance, both local muscular and circulo-respiratory is fostered by specific training methods. Obviously, these two aspects of endurance are interrelated and presuppose the presence of general and specific swimming strength. Coaches utilise six training methods to build up endurance which is of particular import to the middle and distance swimmers, and strength, which is essential to the sprinter.

Over Distance Training:

This method consists of training done over distances greater than the swimmer's racing distance. Generally, this is upwards of 400m. repeats but is relative to a swimmer's ability to hold the stroke over the distance of the chosen repeat.

Speed Play or Fartlek Swimming:

Consists of training over relatively long distances using a variety of speeds over the distance. It can be done informally insofar as the swimmer himself opts to swim at top speed when he wants to or formally on a time/distance basis pre-determined or controlled by the coach.

Slow Interval Training:

Consists of repeats on any distance when the interval rest is less than the time it takes to swim the distance of the repeat. For example, a swimmer who takes 30 secs. to swim 50m. would workout on 20/30/40 repeats x 50m. with 10/15 or 20 secs. rest or going every 40/50/60 secs. swim and rest.

These three methods tend to emphasise the development of *Circulo-Respiratory* and local muscular endurance — Counsilman, 1968 B (4).

Fast Interval Training:

Consists of repeats on shorter distances when the interval rest is more than the time it takes to swim the distance of the repeat. Because of the increased rest the swimmer would be expected to swim faster and with greater effort compared to the previous method. For example, 20 x 50m. with 60/90/2 mins. rest or going every 1½/2/2½ mins. swim and rest.

Interval training is the backbone of a swimmer's training programme — Down, 1968 (5).

Repetition Training:

Consists of repeats on distances shorter than the racing distance and at a greater speed than expected in the race situation. The interval rest between the limited number of repeats allows almost complete recovery of the heart. For example, if a swimmer doing 60.0 secs. for the 100m. performs the first 50m. of this race in 28.0 secs. then he would do 4/6/8 repeats x 50m., aiming to repeat his swims in under 28.0 secs. with about 3-4 mins. recovery rest between each repeat.

These last two methods tend to stress the development of *Local Muscular* and circulo-respiratory endurance.

Sprint Training:

Consists of swimming repeats at top speed on distances less than the racing distance. The interval rest allows complete recovery of the heart. For example, 4 x 50m. flat out at top speed with 5-8 mins. recovery between repeats. This type of swim demands the swimmer to work anaerobically by comparison.

Repetition training and sprint training are a good method of developing swimming strength for speed — Davies, 1966 (6).

Personally, I would refrain from using these last two methods of training with the young or inexperienced swimmer, as to be effective it pre-supposes a solid training background that only comes with experience. Certain methods are best used at precise phases of the training calendar and to ensure variety in the programme there are numerous types of repeat that can be done within the framework of these methods outlined.

In the formation and execution of any training programme the coach has the key role and must be sensitive to the needs of each individual under his care. He must continuously assess the effectiveness of his methods in terms of success and enjoyment which go hand in hand and ensure this for as long as the swimmer's career or interest lasts — Stockholm, 1969 (7), Alexander, 1969 (8).

In this day and age there are many problems for the competitive swimmer to face up to and endeavour to overcome. Many of these are sociological and have been expounded upon at length by responsible coaches and specialists alike. The stress of training and competition is appearing earlier and earlier in a young swimmer's life and very often there is the danger of them being over exposed to the wrong type of competition. Team and club competition on all strokes for the young can be very healthy, provided early success is not highlighted to such an extent that it becomes the root cause for early

withdrawal from the sport, particularly when failure is experienced for the first time. Undue pressures from parents and peers can be one of the gravest types of problem. Parents have an important role to play, particularly to encourage and look after the training requirements of their children. Without their help there would be little success. But their involvement should cease there. The child's success should not be used as a reflected means of glory for any parent whose own sporting achievements were perhaps comparatively limited. This form of exploitation is all too common, especially for the very young, and is abhorred by the majority of coaches. A young child is also educationally committed and should fit their sporting interest around this commitment. It should not be a vice versa procedure. However, help and encouragement should be forthcoming from educationalists to minimise pressures in this connection. Many young competitors are conscious that they receive little or no understanding in this respect. As a general rule it has been my experience to note that the vast majority of successful competitive swimmers have been above average intelligence and quite capable of accepting the strict regimen of training along with academic discipline to obtain the best from both worlds.

If a swimmer wishes to be a success then it necessarily means a serious commitment. This will involve precious time but we should recognise that when young children are training systematically, they are investing in their own future and physically and mentally doing for themselves something that no one else can do for them. They are certainly very healthy individuals with few growth problems. Doctors confirm that next to no injuries are sustained and only the commonplace ailments are experienced — Firsov, 1969 (9), Lee, 1972 (10). As against all this, the benefits of participating in a competitive sport were clearly laid out by Pear and Burnett as long ago as 1925 — Burnett and Pear, 1925 (11).

If a competitive swimmer is given a fair chance to develop self confidence, confidence in their own coach, and above all, confidence in the work that they do, then they will undoubtedly be stimulated to some level of success.

A coach tolerates many practical difficulties. He has to face up to limited facilities or their restricted use at inconvenient times. He too, must be motivated to success, readily recognise the true potential of each of his swimmers, understand their needs and requirements, safeguard their interests and co-ordinate their daily programme so that they grow and develop as well balanced and successful contributors to society.

The coach must have occasion and opportunity to acquire knowledge to enable him to operate successfully. He must develop a sensitivity to coaching and all that it implies but at the same time he requires confirmation that his decisions are right. Help is essential from the specialist field of sports medicine and from the physiologist in particular. There is so much that the coach can be told. The coach is basically a practical man who is not given easily to accepting subjective opinion especially from persons he knows are not as deeply involved in the practicalities of the sport as he is. On the other hand, he is interested in achieving success and is prepared to listen to and experiment with the objective evidence offered by the specialist. However, the results of any meaningful research, must in the first instance, reach the practical coach and secondly, be in a language he readily understands. If there are controversial medical, physiological and psychological problems in any sport then the coach can only concern himself with the clear and undisputable findings of such research and not be influenced by possibilities, or intimations or subjective opinion. Neither, while controversy rages, can the coach be expected to cease all activity.

The most significant problem for any coach is a dilemma. Does he encourage children to start early with the danger of many failing or dropping out, or to start late, with the danger of them never reaching their true potential as a result? Many swimmers like Schollander and Spitz who started early became great while others, who began comparatively later, wish that they had started earlier — Lydiard, 1968 (12).

† This point was subsequently proved fact at the recent first ever World Swimming Championships in Belgrade (Sept. 1973).

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