BMC NEWS

Official Journal of the British Milers' Club

VOLUME 3 ISSUE 15
SPRING 2004


Bowerman
series
DUAL DENSITY

is the NIKE AIR ZOOM ELITE fast enough for you?

runner

The Nike Air Zoom Elite is a lightweight, responsive shoe designed to fulfil a typical runner's dream: getting to the next stride as quickly as possible. Fast shoe. Fast answer.

analytical runner

Way too fast? No worries, here comes the slo-mo explanation. The Air Zoom Elite has a snug fit and it weighs a mere 270 grams. But it is packed with technology. Most notably, it features a dual-density medial post to control over-pronation-, a TPU stability shank across the mid-foot for enhanced stability and full-length Zoom Air cushioning with a special low running profile to improve its responsiveness. Are you ready to experience it?

manic-obsessive runner

Probably not. Our fault. We mentioned a full-length Zoom Air bag with a unique low running profile and we can't get away with that so easily. The unit is just 8mm thick and tuned to the max: that means more compressed and firmer than regular Air. The result is a tighter, more responsive cushioning and a way, way faster shoe. A feeling close to not touching the ground is commonly experienced when wearing the Nike Air Zoom Elite as, when your foot hits the ground, it's instantly up and off again, launching you into a whole new time zone. And off this page, hopefully.

for runners by runners

nikerunning.com

The British Milers' Club

Sponsored by NIKE

Founded 1963

COVER PHOTOGRAPHS

Top: Birmingham, 20.2.04
JO FENN

Bottom: Birmingham, 20.2.04
JO PAVEY (GB) leads from MESERET DEFAR (Ethiopia) in the 3,000m

By Mark Shearman

PRINTERS

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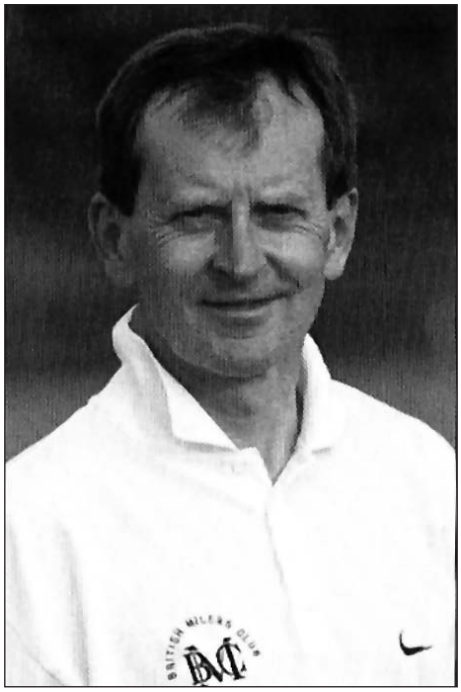
Budapest, 7.3.04. JO PAVEY (623) leads from MARTA DOMINGUEZ (Spain, 579) in the final of the 3km. photo by Mark Shearman.

Chairmans' Notes

The Winter period is usually a time of endurance development for the middle distance athlete. For the BMC Committee Winter is a time of discussions and negotiations and endurance certainly has a part to play.

I am pleased to inform you that numerous negotiations with UKA have now resulted in the BMC for the first time being awarded five Saturdays for staging the BMC Nike GP Series. Inevitably, in what can be termed a 'full' fixture list, there are certain date clashes this season which are clearly out of our control. Being Olympic year the 2004 season does also start a little earlier than usual. The earlier BMC track meets could therefore take on an even greater significance as our athletes chase 'qualifying' times and I also hope that this encourages more of our membership to travel to other than just their nearest GP venue.



Dr. Norman Poole, Chairman

2004 may be Olympic year but many would also say that it has even greater significance as the 50th anniversary of Roger Bannister's first ever sub 4 minute mile, achieved at approximately 18:04 on May 6th 1954. Befittingly Roger Bannister was the first ever President of the BMC when it was formed in 1963. It was therefore a great honour for the BMC to be invited by Sir Roger to assemble the fields for the seven 1 mile races to be staged at the 50th anniversary meeting at the Iffley Road Track on May 6th this year. Please consult the BMC Website for further information concerning entry into these races which understandably will be in great demand. Mathew Fraser Moat is the member of the BMC Committee with overall responsibility for assembling the mile fields at Oxford. The afternoon programme will culminate in the A mens mile is due to start at 18:00 on May 6th, the exact start time of the same race 50 years ago.

This Winter has also seen the continuing upgrading of our website, www.britishmilersclub.com, and many thanks are due to Tim Grose, our webmaster, for all of the late hours which he dedicates to this side of our communications network. We realise that not all aspects of out administration operate as efficiently and quickly as our website and we hope to announce shortly our decisions on improving such matters.

Nike have been our sponsors for some years and without them we could not have staged the Summer GP's which have made such a major contribution to the UK middle distance standards. Pat Fitzgerald and Steve Mosley are currently renegotiating the sponsorship contract with Nike on behalf of the BMC. We hope to announce a greatly extended contract in the near future. The Nike sponsorship is also extremely important in assisting us to stage other ventures such as the Millfield Young Athletes Meeting, organised by Mike Down and the Birmingham Coaching Symposium organised by Dave Sunderland. Once again this winter has seen us discussing how best to extend these two successful ventures and already UKA have informed us that they will continue to support the 2004 Symposium which will be held in the Autumn. The results of our further negotiations on these matters will be announced in the near future.

I hope that your own winters labours have progressed well and that for you improvement is made on the track this Summer.

Subscriptions

If your subs for 2004 (due 1st January) are not paid this will be your last BMC News!

BMC Fixtures - 2004

See **www.britishmilersclub.com** for Entries, Timetables, Seedings, Results, New Fixtures

BMC Nike Grand Prix

Overall Directors Steve Mosley 029 2030 6733, Tim Brennan 01628 415748
Entry fee £2 for BMC members, £12 for non members (or £5 U20)

22nd May	Solihull	M800	Toby Gosnall	0121 445 6411
		M1500	Maurice Millington	01495 775019
		W800, W1500	Steve Mosley	029 2030 6733
12th June	Watford	M800	Rupert Waters	020 8881 5181
		M1500	Philip O'Dell	01234 852038
		W800, W1500	Tim Brennan	01628415748
26th June	Manchester	M800, M1500	Norman Poole	0161 980 8358
	(Sport city)	W800, W1500	John Davies	0161 611 9065
17th July	Cardiff	M800,	Andrew Osment	01344 482171
		W800	Pat Fitzgerald	01895 234211
		M1500, W1500	Steve Mosley	029 2030 6733
8th Aug	Glasgow	M800, M1500	Mike Johnston	0141 634 9966
		W800, W1500	John Montgomery	01560 483225

The BMC's premier meetings are the combined *Nike Grand Prix and UKA Endurance Initiative* meetings. The winning times of the "A" races are of true international standard

UKA Endurance Initiative

(BMC members £2 non members £5)

22nd May	Solihull	M5000, W5000, M3000SC	Pat Fitzgerald	01895 234211
12th June	Watford	M10000, W10000	**AAA champs & Olympic Trial**	enter via AAA
		M3000STCH	Tim Brennan	01628415748
26th June	Manchester	M3000, M5000, M3000SC	Mike Deegan	01457 765416
	(Sport city)	W5000 W3000SC	Mike Deegan	01457 765416
17th July	Cardiff	M3000, M3000SC, W3000	Mark Bryant	01656 880809
8th Aug	Glasgow	M3000, M3000SC	Mike Johnston	0141 634 9966
		W3000, W3000SC	John Montgomery	01560 483225

Entry to the Grand Prix will be guaranteed for those paid up members entering 7 or more days in advance of the meeting provided they have achieved the BMC senior qualifying standard. They are:
M800 1:56.0, W800 2:20.0, M1500 3:56.0, W1500 4:45.0.
Standards for UK EI are:
M3000 8:30, W3000 10.00, M5000 14:40, W5000 17:30, M3000SC 9:20

Bannister 4 minute mile 50th Anniversary Meeting

May 6th - Mathew Fraser Moat 07802 501895

Mile race for Senior and U20 Men and Senior and U20 Women

A chance to be part of the celebration of Roger Bannister's great achievement.
Qualifying standards for 1500m, 1 mile are:-
Senior Men 3:44.0, 4:04.0
Senior Women 4:20.0, 4:40.0
U20 Men 3:54.0, 4:14.0 U20 Women 4:30.0, 4:50.0

BMC Gold Standard

Watford

May 12th, June 23rd, July 21st, Aug 18th
M1500, W800 W1500 -Philip O'Dell 01234 852038
M800 –Rupert Waters: 020 8881 5181

Stretford - M800, M1500

May 11th, May 25th, June 8th, June 22nd, July 6th, July 20th, Aug 17th, Aug 31st
Mike Harris (Enter on the Day, woman can run open races)

BMC Nike Young Athletes Meetings – May Bank Holiday meetings

Millfield – Mon 3rd May

Male - Mike Down 0117 973 3407
Female - Steve Mosley 029 2030 6733
W800 ALL, W1500 U13-U20, W3000 U15 & older
M800 ALL, M1500 U13-U20, M3000 U15 & older

Cardiff – Mon 31st May

Steve Mosley 029 2030 6733
W800, W1500 U13-U20, W3000 U15 & older
M800, M1500 U13-U20, M3000 U15 & older
M & W OPEN 10000 incorp Welsh champs

BMC Regional Races

Sutcliffe Park David Reader 07968 498706

Wed May 19th M800 W800 M1500 W1500
Wed June 16th M800 W800 M1500 W1500
Wed July 14th M800 W800 M1500 W1500
Wed Aug 4th M800 W800 M1500 W1500

Colindale - Wed 14th Jul

M5000 – Tim Grose 01372 466946

Brighton - Wed 11th Aug

M800, W800 - Chris Carter 01273 503446

Birmingham University

Bud Baldaro 07741051235
Wed 28th Apr M1500, W1500
Mon 31st May M800, W800
Wed 14th July M1500, W1500

Brunel University

Pat Fitzgerald 01895 234211
Wed June 2nd M800 W800 M1500 W1500
Wed June 9th M800 W800 M3000 W3000

A Combination of Different Training Means in the Preparation of Elite Middle Distance Runners

By Ants Nurmekivi, Estonia

The author, a sport scientist and former distance runner, looks at the theory of adaptation and presents optimal combinations of potential training means in the planning of macrocycles for elite middle distance runners.

The training of middle distance runners is a complicated and complex task because it requires an athlete to achieve high aerobic and anerobic capacities, as well as a good level of strength endurance and speed strength. The situation becomes even more intricate at the elite level when, besides the complex approach, we are looking for the development of high-level movement capacities through concentrated single-direction training loads. The last aspect is made difficult by the fact that the combination of training means used in the development of different movement capacities can take a negative direction.

From the above emerges the need to find the best possible optimal combination of training means that would guarantee the best result from training and planned performances. In the choice of such variation we can look at training as an adaptation process that takes into consideration the functional specialization of the organism. This approach makes it possible to find concrete variations of combined training means, which make allowance for the individual characteristics of an athlete and the demands of a particular distance.

TRAINING AS ADAPTATION

Training based on adequate loading and duration is responsible for the activation of adaptation mechanisms. The general adaptation mechanism assures the transfer from short-term to long-term adaptation, during which the capacity of a fixed adaptation system improves to the level dictated by training (Viru, 1988).

As protein synthesis requires a high energy expenditure, the higher the energy potential of a cell, the better are the possibilities of increasing the intensity of protein synthesis. This is an important factor in training, indicating the need and preferential choice of means for structures that correspond to the nervous system regulators and energy demands of an event.

Extensive adaptive changes in the organism are restricted by the exhaustion of adaptation energy (Selye, 1960), the adaptation capacity (Meerson, 1981) or the current adaptation reserves (Verhoshansky, 1985). Intensive training that is directed to the development of different systems in the organism leads to a competition for the available adaptation reserves. The organism is not capable of securing high level adaptation for several different systems and adaptation processes suffer accordingly.

A typical example of this is the development of strength and endurance capacities. Extremely intensive strength training requires the direction of the energetic and plastic (protein, amino acids, etc.) reserves to the adaptation of the contractile mechanism of muscles, while a large volume of endurance training calls for preferential reserves for the adaptation of the mitochondria apparatus.

A solution to this problem can be a change in the dominating adaptation system after a certain time period. It allows one to concentrate on the use of the restricted adaptation reserves on the development of a chosen system by employing specific training means.

This is in the theory of adaptation regarded as a way to reinforce the chosen dominating system at the cost of other systems in the organism. Consequently, in order to maintain the other functional capacities it is necessary to use only relatively short periodical loads that correspond to the required functional system.

On the other hand, the organism is capable of reaching a considerably higher work capacity when adaptation reserves are concentrated on the development of a concrete system. While this is much better than dispersing the reserves, there are at least two hidden dangers:

1. A possible exhaustion of the dominating functional system;
2. A reduction of the structural and functional reserves of the other system.

A solution appears to be in a purposefully planned combined adaptation that attempts to avoid cycles of deadaptation-readaptation.

ORGANISM AS A BIO-SYSTEM

The organism, as a self-regulative system, is not capable of differentiating sufficiently between training means that are used in parallel during some training stages. The organism simply reacts in a generalised and average manner. While this reaction can be considered as sufficient in the training of young athletes and lower-level performers, it is not acceptable for elite middle distance runners. It does not, as a rule, lead to the improvement of the limited factors in an athlete's work capacity. The same problem occurs when different training means are changed for too frequently during a training stage - every 10 days, for example.

The mechanism that is made up from internal, as well as external, combinations of its systems is the foundation for the development of an organism. For this reason it is necessary at the high-performance level to graduate to increasingly more complicated training plans in order to reach a training stimulus close to racing conditions from highly effective adaptation processes.

This, however, is made difficult by the fact that there are several components responsible for race results in middle distance running. Improved performances demand more intensive training loads, which in turn demand suitable and effective load variations. These variations allow us to maneuver with the adaptation reserves and create the necessary prerequisites for an active rhythm of changes in the specific work capacity of maximal performance at the planned time.

FUNCTIONAL SPECIALISATION

An integral and universal aspect of the

organism is that sporting activities depend in the same functional systems. From a practical viewpoint it is therefore necessary that these systems specialise to fit the demands of the regimen of the movement activity. Consequently the endurance quality of a middle distance runner depends on one hand on the work regimen of the involved muscle groups and, on the other hand on the corresponding reactions of the respiratory, cardiovascular and energy supply systems. We can look at it as a correlation between motor and vegetative functions that lead to morpho- functional Specialisation (Verhoshansky, 1985, 1988). In endurance events this is above all expressed in a planned and harmonious development of strength and metabolic qualities.

Contemporary studies and practical training experience have shown that an effective development of specific endurance needs the use of strength and speed exercises (Noakes, 1988, 1991; Boyle, 1992). Consequently we can look at the simplifies work capacity of middle distance runners as a pyramid with an endurance and strength base and a speed summit (Figure 1). The direct indicator of the work capacity is the runner's racing endurance (both alactic and lactic) and speed strength.

The terms **speed endurance** and **local muscular endurance** are concepts that need some explaining. Local muscular endurance, like strength endurance, is associated with the maintenance of the strength component in endurance, but its definition is based on the combined developmental level of the oxidative and contractile qualities of the metabolically active muscles (Verhoshansky, 1988).

The development of local muscular endurance comes from combined aerobic and anaerobic threshold level exercises, maximal strength exercises and exercises under harder conditions (up-hill running, moderate bounding, circuit training, etc.). Local muscular endurance is also influenced by rhythm and acceleration runs. All these mentioned training means are anabolic and can be employed over a relatively long time period. According to Prof. N. Jakovlev, the maximal development of the biochemical and molecular mechanisms of strength and speed capacities takes much longer than the maximal development of endurance qualities (for example, maximal O2 consumption).

It follows from the above that the strength and speed capacities of middles distance runners need attention already at the start of a years's training cycle, keeping in mind that the prerequisite in the performance of these exercises over an extended time period is to avoid high level lactate concentrations.

THE PRINCIPLES OF MACROCYCLE PLANNING

The construction of a macrocycle in middle distance is based on the understanding that a training year has to be progressive and should take into consideration the following factors:

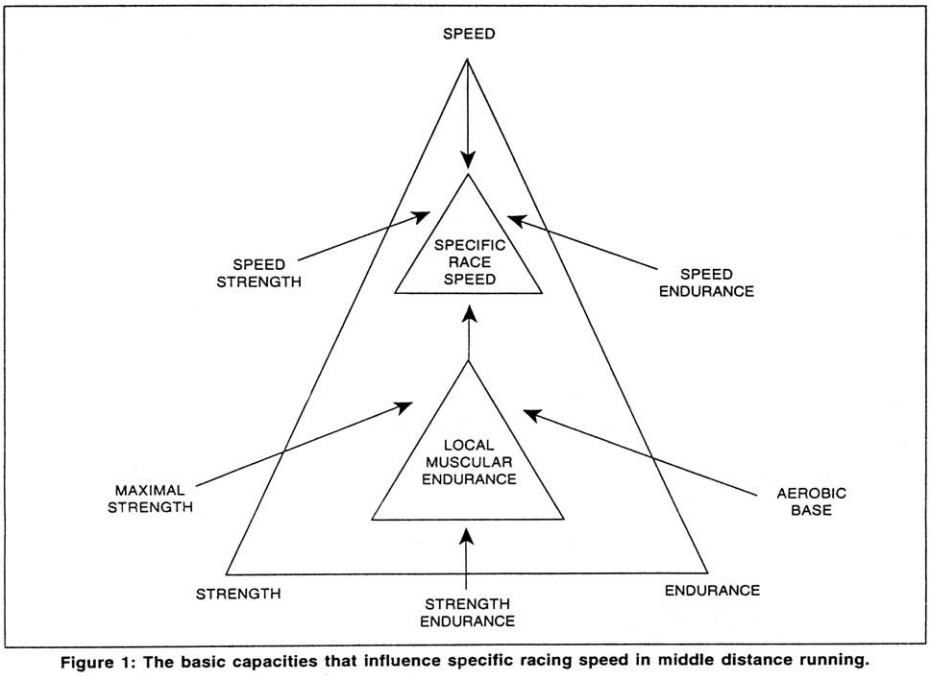


Figure 1: The basic capacities that influence specific racing speed in middle distance running.

Solihull, 6.8.03. STACEY JOHNSON. photo by Mark Shearman.

- No single preparation aspect or movement capacity can be entirely neglected in the basic, as well as the specific, training stage. Only emphasis on one or another component varies.
- Optimal development demands the engagement of training means that allow for continually increasing potential with variations in intensity.
- It is important to consider the inversely proportional aspect of training effects. The faster the development of a capacity, the quicker will it be lost and vice versa.
- It is easier to maintain an achieved training level than to re-develop it after a considerable drop-off for some particular reason.

The planning of a macrocycle can be based on the following sequence of training means with increasing potential:

Endurance: Runs at aerobic threshold level - runs at anaerobic threshold level - runs at critical speed - runs at specific racing speed (anaerobic glycolytic).

Strength: Strength endurance (local muscular endurance) - maximal strength - speed strength and strength endurance (new maximal strength level)

Speed: Rhythm and acceleration runs - maximal speed runs - runs to develop speed endurance.

All the training means listed above develop basic movement capacities and

Table 1

Positive Variations	Physiologically Positive Background	Recommended Use
1. Aerobic (at aerobic and anaerobic threshold levels) and local musclar endurance development means	Both influence slow-twitch muscle fibers. The lactate concentration doesn't exceed anaerobic threshold. Both training means are anabolic.	Can be used practically the whole year to develop and maintain threshold running speed.
2. Aerobic training means, alactic strength and speed exercises (moderate volumes)	Alactic exercises activate the creatine phosphate mechanism and create favorable conditions for energy transfer from mitochondria to myofibrils. Both training means have low lactate concentrations and are anabolic.	Can be used over extended periods as a basic training means in the preparation stage.
3. Acceleration/rhythm runs and technique development exercises (knee-lift runs, bounding runs, etc.)	Both training means influence fast-twitch muscle fibers. Neuro-muscular coordination improves and the short duration of exercises keeps lactate accumulation low.	Can be used the whole year to develop and maintain running speed and improve technique.

are responsible for firm reactions from the organism, reflected in specific adaptation. However, as all the specific movement capacities, or their components, are developed throughout the whole macrocycle, there is a possibility that competitive negative relationships arise in the internal adaptation programs. It is therefore important to pay attention to optimal combinations of training means by using matching combination and avoiding non-matching variations.

The studies by N. Dorotshendo discovered some years ago that the performances of elite middle distance runners in climatic competitions were related to the training means in the preparation period, particularly to the loads employed at anaerobic threshold and critical speed levels. Athletes who added anaerobic training considerably later to their training programs turned out to be far more successful. On the other hand, maximal volumes of anaerobic glycolytic work at the end of the preparation period led to top form at the beginning of the season and not when it was needed. Further studies have confirmed that fact that extended periods of high-volume anaerobic glycolytic training can have a negative influence on basic endurance (Nurmekivi/Lemberg, 1992, 1993; Nurmekivi, 1991).

The combination of positive and negative variations of training means in a macrocycle of middle distance runners are summed up in Table 1 and 2.

THE SPECIFIC TRAINING STAGE

The specific training phase attempts to maintain basic aerobic endurance, while emphasis is placed on the development of maximal speed and the use of glycolytic training means. The training program stresses maximal speed (distances up to 100m) speed endurance (150 to 300m) and specific endurance (400 to 600m) development in intensive interval and repetition runs.

It is interesting to note here the studies by I. Zhukov and Z. Anzarov (1984), showing that the improvement of performances of elite 400m runner did not essentially depend on the components of specific training but rather on the appropriate combinations of these components. The best results were achieved from an increased volume of 400m training means that were directed to the development of speed endurance and specific endurance. Improvements also occurred when the volume of speed and specific endurance training was increased simultaneously. Negative effects occurred when speed and speed endurance training means were used simultaneously.

Most likely the same paired combinations of training means also apply to the training of 800m runners, as the basic performance factors of world class 800m exponents are optimal speed and a very high level of specific endurance. Training for speed endurance considerably increases lactate accumulation that hinders the development of maximal speed and makes an in-parallel development less effective.

IN SUMMARY

It appears necessary in the planning of macro-cycles for elite middle distance runners to take into consideration the sequence in which different potential training means are engaged in a particular preparation stage, as well as the suitability of their simultaneous combinations. The use of optimal combinations helps to improve race results. It should therefore form the base for the creation of a model macrocycle for middle distance runners after the individual characteristics and the demands of a particular distance are taken into consideration for concrete training plans.

Table 2

Negative Variations	Physiologically Negative Background	Recommended Use
1. Large volumes of aerobic and maximal strength training means.	Competition for adaptation reserves.	It is advisable to develop maximal strength in a specific strength block during which the aerobic running volume is reduced.
2. Large volumes of aerobic and anaerobic-glycolytic training means.	The high level of lactate inhibits the activity of oxydative enzymes and aerobic work capacity drops. Glycolytic training means have a catabolic effect.	It is advisable to separate these training means to be used in specific stages.
3. Maximal speed and maximal strength (large loads) development means.	Maximal strength development exercises influence both fast- and slow-twitch fibers, invite fatigue and reduce muscle elasticity. This creates unsuitable conditions for maximal speed development.	It is necessary to develop these two capacities in separate stages.

How Much Do You Know About Running?

If you like running, you will like it more if you know the sport's background and subjects allied to running success.

History

1. Who was he last British athlete to hold the 10k World Record?
2. Who was the last U.K. athlete to hold the 5k World Record?
3. Who was the first man to break 27 minutes for 10k?
4. How many U.K. records does Kelly Holmes hold?
5. Who is Britain's fasted ever male marathoner?

Physiology

6. How long can a runner go without running before endurance begins to decline?
7. When is the best time of day to train if you wish to loose weight?
8. What is the new way to estimate your maximum pulse rate?
9. What is the Balke Test?
10. What is the lactate threshold?

Sports Medicine

11. How long should ice be applied to a sudden muscle injury?
12. Knee injury sufferers are nearly always told to strengthen a certain group of muscles. Which group?
13. Lower back pain sufferers are usually told to strengthen a particular group of muscles. Which group?
14. What are 'Contrast baths'?
15. If an athlete has numerous white spots on the nails, what it is indicative of?

Training

16. What event is said to be 83% anaerobic and 17% aerobic?
17. What is aerobic running and what is anaerobic running? Give examples.
18. What are hollow sprints?
19. What is meant by doing sets in track training?
20. What is a 'variable pace' track session for a marathoner?

Answers on page 28

BMC Races

All entrants to the BMC Grand Prix need to be warned that seniors wishing to enter 'A' or 'B' races who have achieved the BMC qualifying times and have NOT joined the Club must pay £12 to run.
Note also that those who enter 'A' and 'B' races and fail to appear without explanation will be BANNED from 'A' and 'B' races for the remainder of the season.

All Rounders 2003

Using the 1998 Hungarian scoring tables the best performances for leading British performers at 800 and 1500 meters have been added together to show the following:-

Whiteman ..2304	Holmes 2371
East 2291	Tullett 2355
McIlroy 2243	Fenn.....2276
Speaight 2235	Moore 2240
Mayo.....2188	Lyne.....2216
Shone 2174	Scott.....2211
Mulvaney ..2168	Ovens.....2209
Soos.....2161	Dobriskey ...2183
Thie 2111	Whittaker....2163

Note Jo Fenn's times, both indoor, have been scored on outdoor tables.

Whilst the tables are much criticised they remain the only(?) method available for comparison purposes. Readers will note that the ladies outscore the men at each level but that tends to reflect the level of performance one against the other last year. Note also that only those with marks in the top 50 of each event are listed.

Energy Systems and Duration of Effort

By Kevin Prendergast, Australia

The following text attempts to outline in a systematic manner the range of training sessions used in middle distance running in terms of duration and effort and to relate them to the energy systems and the intended training effort.

INTRODUCTION

Most coaches, particularly in their early days, have been confused by the terminology used in the description of training sessions. Those with a scientific background are often dismayed to find that this is of little help in understanding what it is all about, and those wishing to apply logic are in similar difficulty. In as much as there is a recognised terminology, it is very much a matter of "if you know what it means, you know what it means." But some of it is contradictory, some of it is ambiguous, and some of it is simply unhelpful.

For instance, alactic can be aerobic or anaerobic, and anaerobic can be lactic or alactic. Even the term lactic is insufficient because there are two aspects - lactic production and lactic tolerance - both of which are important. Then there is specific endurance, which raises the question "specific to what?"

Some of the "you know what it means, if you know what it means" is apparent in the distinction some people make between repetitions and intervals. It is not a logical distinction so there is little chance of knowing which is which unless you know the language, and even then there is disagreement. Even with the term *interval,* whether or not it is distinguished from *repitition*, there is disagreement and confusion. Some claim that the interval refers to the recovery period and others to the effort, and both are equally adamant.

ENERGY, POWER AND ENERGY SYSTEMS

It will be helpful to recall a few scientific terms before we begin discussion of energy systems.

Work is performed on a body when a force is applied to it over a distance. If the force is constant, work is equal to force multiplied by distance. In the case of a runner the force is applied to the runner's centre of gravity by means of a series of contractions of various muscles of the leg while the foot is fixed on the ground. The distance is the distance traveled by the centre of gravity while the foot is on the ground. This work performed on the runner by means of his muscular effort results in his forward motion.

Energy is define as the capacity for doing work. For the runner that capacity exists as chemical energy. The energy enables a chemical substance adenosine diphosphate (commonly known as ADP) to combine with free phosphorus (P) to form adenosine triphosphate (commonly known as ATP). ATP is the substance which causes the muscle to contract and so results in physical work. In the effort ATP breaks down again to form ADP and P. It will require further chemical energy to cause them to combine again. The chemical reactions can be represented as follows:

ADP + P
Chemical Energy -› -› Kinetic Energy
ATP

Power is the rate at which work is done. A 100m runner is very powerful beacuse his work is performed quickly. However the work, and hence the energy he has used, would not keep a marathon runner going for even a minute of his approximate 200 minutes.

An energy system is a system within the body by means of which chemical energy is converted into physical work. All systems produce ATP, but the means by which they do it differ, and each for a different purpose. An energy system can be thought of as a reservoir from which energy is drawn. As with all reservoirs, some are big and some are small; some can be emptied quickly while others take longer to empty; some can be replenished quickly but others only slowly.

These are four types of energy system, as follows:

Stored ATP

The smallest reservoir of energy is ATP stored in the muscle. There is only a sufficient amount for a single contraction and therefore is of great value to a thrower but of very limited value to a runner. Obviously it is useful in a sprinter's start. Since the ATP is immediately available the rate of its use can be very rapid and hence it is the most powerful of all systems.

CP System

The next smallest reservoir is the creatine phosphate (CP) system. Unexerted muscles have a tore of CP which, when high demand is made on the muscle, breaks down to C and P. This breakdown releases chemical energy, which enables ADP and P to combine, thus causing muscular contraction. When the available CP is used this system is finished until rest allows the C and P to combine again. For a 100m runner this system is depleted after about 6 seconds, so it is a very limited system in terms of energy. However, it is the system which enables a top 80kg sprinter to accelerate from 0 to 12 meters per second (43kmph) in 6 seconds, so it is very powerful.

Although there is little in the literature on the topic it would appear that the CP system can be made to last much longer than 6 seconds, in fact up to about 25 seconds, with very little reduction in speed. For instance a 400m runner, by restraining his explosive effort and running at about 92.5% of his best 100m speed for the first 100m can run the first 200m at 96% of his 100m speed and the first 300m at 96%, before deceleration becomes an issue. This indicates that acceleration is quite wasteful in terms of energy, and that this extended CP system, while not as powerful, produces considerably more energy. For a 400m runner it is worth developing. It is both identifying as a subsystem and it is reasonable to call it the *extended CP system*. This is unambiguous and is preferred to speed endurance. The latter would be good description, except that it is used for distances up to 800m, which is not really speed.

The above two ways of using the CP system are concerned with different aspects of it. The very short duration of

effort is concerned with the power of the system while the longer effort is concerned with its capacity.

Lactic System

The next in ascending order of energy capacity and descending order of power is the lactic system. It is an unusual name for an energy system, because it is the name of the inhibitor of the system. However, this characterisation is the predominant feature for the runner, beacuse of the discomfort it causes.

In this system glycogen in the muscle is broken down chemically in an anaerobic reaction (i.e. without oxygen). This releases energy which enables ADP and P to combine to form ATP, whence muscular contraction occurs. The chemical process of the glycogen breakdown takes longer than the breakdown of CP, so the system is not as powerful as the CP system.

However, its capacity is also not as limited because the muscles have a plentiful supply of glycogen and the limitation is one of muscle tolerance of lactic acid, an end product of chemical breakdown of glycogen without oxygen.

The lactic acid inhibits the operation of the muscles and the accumulation of it is therefore accompanied by deceleration. The most striking illustration of this is in the 400m event, in which the speed falls by about 13% from the second to the fourth 100m, and if 10m intervals are considered the reduction from the back straight to the last 10m would be about 20%.

There are two aspects to this system also, namely power and energy. The first is the speed the system will produce, and the second is its capacity, i.e. how much work can be derived from it. The latter is determined by tolerance of lactic acid, or the ability to continue the effort while minimising deceleration.

Aerobic System

This is the least powerful of the systems but it has the greatest capacity. In it glycogen is broken down chemically together with oxygen, and the end products are carbon dioxide and water, neither of which inhibits the process. As with the other systems the breakdown releases energy which enables ADP and P to combine to form ATP. The rate of the chemical breakdown is limited by the rate at which oxygen can be consumed. This is not as fast as the anaerobic breakdown so the system is not as powerful as the lactic.

The supply of oxygen of course is limitless as the capacity of the system is limited only by the fuel available. The glycogen will last about one hour and beyond that breakdown of the body occurs, begining with fat. The process is steady state, i.e. there is a balance between oxygen intake and speed of running, and the maximum speed is constant.

Watford, 5.7.03. DANNY CRATES (161). photo by Mark Shearman.

As with other systems, it has two aspects - power and capacity. There are two factors which affect power. The first is the rate at which oxygen can be consumed, and is usually known as maximum oxygen uptake. The second is anaerobic threshold, the intensity of effort beyond which the lactic system is invoked.

Since the speed is constant, the capacity is affected by both of the above two factors and beyond that the available fat in the muscle.

Systems in General

The first three of the above systems are anaerobic, i.e. they work without oxygen. The last, as its name says, is aerobic, since it uses oxygen. There is another system, though not in the sense of the above. It is the nervous system, which transmits the signal to contract from the brain to the muscle. Obviously this is very important for a sprinter, because it determines reaction time to the starting gun.

TRAINING SESSIONS

Many training sessions are repetitions of efforts of a certain duration and the duration varies from session to session. We break the session into repetitions in order to maximise the work we can do at a given intensity in the session, thereby maximizing the training effect. If all of the work in the session was done in one effort, it would either not be as much, or it would be slower, and the training effect would be less.

There are two ways we can increase the intensity - by increasing the speed or reducing the recovery between repetitions. The two have different purposes. The first has to do with the energy system which will sustain the effort; we vary the speed in order to call upon different energy systems. The second is particularly applicable to runners in the 400m to 1500m bracket, though it is useful to runners on either side of this range.It stresses the athlete by calling for an effort while the muscles are subject to lactic acid loading and hence causes him/her to adapt to work with this loading.

TRAINING ENERGY SYSTEMS

In this type of session we allow sufficient recovery to enable the speed for a given duration to be maintained at near maximum (approximately at or above 95%) for the complete set of repititions. The duration and the intensity are inversely related. Since the intensity determines the energy system(s) which sustains it, the duration of the individual efforts tell us what systems are being trained (see Table 1).

What sessions an athlete does and how frequently he does them depend on the event he is training for and the stage he is at in your program. A 100m runner will use mainly sessions 1 to 7, while an 800m runner will use mainly 6 to 13. In general, all sessions in these ranges will be there all of the year, but the emphasis will shift

SESSION	DURATIONOF EFFORT	ENERGY SYSTEM (S)	POWER CAPACITY	TRAINING EFFECT
1.	0 to 0.2 sec	Nervous	—	Reaction
2.	0 to 0.2 sec (per leg)	Alactic (stored muscular ATP)	Power	Initial thrust
3.	0 to 0.1 sec	Alactic (CP system)	Power	Single leg thrust at top speed
4.	1 to 2 sec	Alactic (nervous + stored ATP + CP)	Power	Starts
5.	2 to 5 sec	Alactic (CP system)	Power	Acceleration
6.	5 to 15 sec	Alactic (CP system)	Power	Maximum speed (Flying start)
7.	15 to 30 sec	Alactic (extended CP system)	Capacity	Speed endurance (Ability to hold > 95%)
8.	30 to 45 sec	Lactic	Power	Ability to produce energy without O_2 or CP
9.	45 to 90 sec	Lactic	Capacity	As above, plus ability to tolerate lactic acid
10.	90 to 300 sec	Lactic with aerobic support	Aerobic Power Lactic Capacity	Ability to use O_2 to hold up pace as lactic acid accumulates
11.	5 to 10 min	Aerobic with minor lactic	Aerobic Power	max. O_2 rate
12.	10 to 20 min	Aerobic	Power Capacity	Raise anaerobic threshold
13.	20 to 60 min	Aerobic Fuel: glycogen	Capacity	Ability to maintain steady pace
14.	Above 1 hour	Aerobic Fuel: glycogen + fat	Capacity	Ability to maintain steady pace for marathon

Table 1: Near-maximum efforts—duration/training effort.

from the higher number to the lower number sessions as the athlete moves from the off-season to the track season.

The number of repetitions he does in a session will be the maximum while the pace holds. The limited factors, providing the recovery has been sufficient, will usually be muscular tiredmess or glycogen depletion. Obviously the longer the duration of the effort the fewer the repetitions.

TRAINING LACTIC TOLERANCE

For the middle distance runner the lactic system is fundamental. The race is too long to rely on the powerful CP system and too fast to be satisfied with the economical but weaker steady-state aerobic system. The lactic system is the link between the two which holds the performance together. But it can only do so if it can be sustained in the presence of its by-product, namely lactic acid. No lactic acid means no lactic energy, so the by-product is necessary, but it is debilitatiing; it will cause deceleration. The better a runner can cope with it the less will be the deceleration, so we train the coping. This consists of subjecting the body to levels of lactic loading, while expecting the same speed in each repetition. We acheive this by not allowing complete recovery between efforts which use the lactic system.

Progression can be achieved by shortening the recovery period, i.e. subjecting the body to exercise with the increasing amounts of lactic acid in the muscles.

It is the pace of the effort which determines whether or not it is lactic, not the duration. If the pace is too fast to be sustained by oxygen intake yet too slow to call upon the powerful CP system, then it is a lactic effort, which causes an accumulation of lactic acid. For a given pace of lactic effort the duration of the effort will determine the amount of accumulation of the lactic acid.

A hard sustained lactic effort will result in an accumulation of lactic acid which will take 1/2 to 1 hour to dissipate. Therefore recovery periods of only a few minutes will still leave the lactic level high after a hard effort. For more moderate, but still lacitc efforts, the level can be kept up by reducing the recovery periods to a minute or less.

Creatine phosphate (CP) requires about 2 to 3 minutes to resynthesize in the muscles after the cessation of a powerful effort.

Thereafter it is available for another powerful effort. Therefore, if we want the repeat efforts to be without the benefit of the powerful CP system, we restrict the recoveries to less than 1 minute.

Repetitions are not the only way to train lactic tolerance. An effort of duration of 1 to 2 minutes not only demands lactic energy, with its attendant acidic by-product, it also requires tolerance of the by-product as the effort continues.

In all of the the above the recoveries are indicative only. Progression is the measure for the improvement in lactic tolerance. This can be achieved by maintaining the pace and progressively reducing the recovery. The start point in this block of the program could be either present race pace or goal pace.

However, at the beginning of winter training, when pace would be absent after a rest, progression can be by pace rather than recovery, until the pace is up. In the early part of training program the emphasis will be on sessions 21, 22 and 23 for a middle distance runner and 17 for a 400m runner.

SESSION	DURATION OF EFFORT (SEC)	PACE	DURATION OF RECOVERY (SEC)	NO OF REPS*	TRAINING EFFECT
15.	15 to 30	400	60 to 120	3 x (3 or 2)	extended CP lactic tolerance
16.	30 to 60	800	90 to 180	8 to 4	lactic production lactic tolerance
17.	15 to 30	800	30 to 60	15 to 8	lactic tolerance
18.	15 to 30	800	15 to 30	2 x (5 to 3)	lactic tolerance
19.	30 to 60	1000	60 to 120	12 to 6	lactic tolerance
20.	30 to 60	1500	60 to 120	15 to 8	lactic tolerance aerobic
21.	30 to 60	2000	30 to 60	15 to 7	aerobic lactic tolerance
22.	90 to 180	2000	120 to 240	12 to 8	aerobic lactic tolerance
23.	90 to 180	3000	60	12 to 8	mainly aerobic lactic tolerance

Table 2: Range of lactic tolerance sessions. (* — larger number of repetitions for shorter duration)

Very Important Notice

Athletes wishing to run in ANY BMC organised race who have done the BMC senior qualifying time in either the 800 or 1500 meters and have NOT joined the BMC must pay a £12 (twelve pounds) entry fee. This is a stepping stone towards the Irish Milers' Club rule that non members cannot run in any of their races.

Athletes who enter "A" and "B" races in ANY BMC organised meeting and fail to appear without a proven reason, will be banned from ALL BMC races for the rest of the year. Injury as an excuse will not be accepted unless a medical certificate is posted in. The BMC Grand Prix directors already have a black-list of habitual absentees.

BMC HONOURS MIDDLE DISTANCE COACHES

John Cooper of Sutton-in-Ashfield has been voted BMC COACH OF THE YEAR. A plaque recognising this will be presented at the Solihull Grand Prix.

John Sullivan of Tower Hamlets, a member of Woodford Green A. C., has been awarded the BMC MERITORIUS COACHING TROPHY for outstanding coaching achievements over the past 40 years, which includes coaching 43 athletes for G.B. International selection.

The 2003 COACH OF THE YEAR AWARD to Mark Rowland of Susssex, has yet to be presented even through it was available at one of the Grand Prix he attended.

NEW APPOINTMENT

Ollie Wright, an experienced coach one of whose specialities is getting recruits for the S.A.S. Territorial Amry fit, has been appointed BMC Secretary, he resides in Dudley, West Midlands. He is also a high ranking member of the BMC Coaching Sub-Committee.

RECOGNISED AT LAST!

U.K. Athletics coaching department has recognised the Level 2-3-4 applicants can now list attendance at BMC residential courses as counting towards the number of required courses to qualify for those levels.

Be Specific in your Training

by Derek Parker (Level 4 Coach)

Athletics training should be specific to the physiological and tactical requirements of the event.

For example, an athlete targeting 800 metres in 1 minute 52 seconds must train at that pace.

Typical sessions are 3 x 4 x 200 metres in 28 seconds with 30 to 45 seconds between repetitions / 8 minutes between sets; OR 2 x 3 x 300 metres in 42 seconds with 45 to 60 seconds between repetitions / 8 minutes between sets; OR 4 x 400 metres in 56 seconds with 2 to 3 minutes recovery.

Race pace work-outs are complemented by 400 metres pace sessions for speed, e.g. 3 x 2 x 200 metres in 25 to 27 seconds with 45 seconds between repetitions / 10 to 15 minutes between sets.

Speed endurance is developed by 1500 metres pace sessions, e.g. 10 x 300 metres in 45 seconds with 45 to 60 seconds recovery. Steady runs of between five and ten miles, three or four times weekly provide aerobic endurance.

Training must include simulated race situations. For example, instead of always using the inside lane, 800 metres runners should run 100 metres repetitions at race pace in different lanes, simulating the first stage of a race, before they reach the break point.

The work out becomes more competition specific by recruiting colleagues to run in other lanes faster and slower than the athlete's optimum race pace during these 100 metres bend repetitions.

This helps athletes develop their own pace judgement, without being influenced by rivals in inside or outside lanes.

The first 100 metres of an 800 metres race is usually the fastest phase, so athletes should regularly practice bend running one to three seconds quicker than race pace to prepare themselves physiologically psychologically for the quicker tempo.

Running at a tangent from break point to the 200 metres mark should be rehearsed. Tangent running prevents athletes running additional distance by cutting inside too abruptly after the break. It also minimises the risk of collision with rivals.

Training at 800 metres pace with other runners teaches athletes to avoid getting boxed in during races. It also familiarises them with being surrounded on all sides by race rivals.

Many 800 metres races are won and lost in the final strides. Often, it isn't who sprints fastest at the finish who wins. It's who decelerates least.

The outcome of these last few vital metre depends on the ability to keep going mentally and physically, despite extreme fatigue.

This quality can be installed - and alkaline buffers to neutralise lactic acid developed - by sessions like 3 x 6 x 60 metres full out, with 20 seconds turnaround between repetitions, and five minutes recovery between sets.

Athletes should drive their arms vigorously and run beyond the finish line, while maintaining rhythm, technique and relaxation.

Track sessions can be concluded with 3 x 30 metres sprints from a flying start with dip finishes and a slow walk back recovery.

Dip finishes should be practised regularly since many 800 metres races end with the breadth of a vest separating contending athletes.

The objective in dip finishing is to thrust the chest forward on the last stride before the tape, while throwing the arms back simultaneously.

Athletes competing indoors should visit race venues beforehand to acquaint themselves with tight bends, banked slope and lane markings.

The Chinese philosopher, Confucius, said: "In all things, success depends on previous preparation and, without such preparation, there is bound to be failure"

Confucius would have been an excellent coach. Heed his advice and train specifically.

Quotes

"I could not touch my toes, but I could break 4 minutes for the mile"
Roger Bannister

"Any runner who does not take ATHLETICS WEEKLY regularly is an idiot. Also, any coach who is not in receipt of THE COACH, is a bigger idiot"
Frank Horwill

"The BMC has a lot to answer for, making young runners chase fast times to the exclusion of other benefits the sport offers"
The late Brian Mitchell

"The BMC Grand Prix is obscene"
An Official of Windsor, Slough and Eton Club

"The Bastards! They've fixed the Olympic Games at the same time as the National League Final!"
Fixtures Committee Official

"I don't know why I'm here…"
U.K. Athletics Coaching Official speaking at the BMC organised coaching conference in Birmingham, 2003

"I hope you don't read that rag ATHLETICS WEEKLY"
U.K. Athletics Coaching Official speaking at the Birmingham conference in 2003

An Hour With Chris Moss

Chris Moss allowed me an interview at his office at the Leckwith Stadium in Cardiff. His position as a Development Officer for Welsh Athletics has allowed him a base there only very recently.

He told me that he had begun running 'seriously' when aged 14. He had spent his early years in Essex and Kent. His start commenced when a friend's father gave both a lift to the nearest track. Early competition began with runs in the London mini-marathons. He joined Blackheath and came under the wing of coach Andy Frankish. From there he progressed as follows:

	400	800	1500
1993		2:03.96	
1994		---	
1995		---	4:02.01
1996	49.2	1:50.62	
1997	49.5	1:49.98	3:50.80
1998		1:48.43	3:48.30
1999		1:52.47	
2000		1:47.75	3:47.00
2001		1:48.95	3:44.33
2002		1:48.01	
2003		1:46.92	

Whilst at Loughborough and since, he has been advised by George Gandy. Chris is inclined to agree with the '10% coach - 90% athlete' road to success but insists it will vary from athlete to athlete. In addition he suggests that coaching is not 'rocket science' but I suspect being independent minded he is capable of looking after himself to a large extent. Other athletes may need more caring approach.

His training is governed by a long run of injuries that has involved surgery. It is therefore largely on grass. Up to 60 miles per week in the winter, over six days and will include weights, circuits, aqua jogging, some sand dunes and cycling. In this period he meets up with James Thie and James Nasrat and others every couple of weeks for sessions. This is done with the agreement, and input from, their coaches.

Chris accepts the need for varied training as repeated injuries give the need for non-running exercise and he can switch to it quickly in order to maintain fitness.

Summer training usually begins around Easter with perhaps two track sessions per week with work on grass being pre-eminent. His need to protect his injury prone legs being uppermost in his mind.

His favoured training is on the sand dunes, to be found in several spots within easy reach of Cardiff. He reasons that this form of training is that which allows him to work hardest and is really tough. (BMC members will be aware that the club holds a training week-end at Merthyr Mawr every year where sand dunes abound).

On being reminded that he had been in the top 10% of UK 800 men for some time did he feel that he had reached his limit? He pointed out that despite problems he had achieved a PB in 2003 and when pressed said he thought that getting inside 1:46 in 2004 was not an unreasonable target. As to the future who can say? Injuries allowing a major final must be THE target, and once there…..

He accepted that his 400 times were not as good but pointed out that he considered relay 400's as being a sound substitute, however something under 47 should assist sub 1:46 running. As to 1500 racing, it's a long way!! For the moment at least he will concentrate on two laps.

He was asked about overseas racing and agreed that if Brits had more chances to race abroad then he felt sure that better times would follow. He is grateful to Andy Norman for giving that opportunity in Hungary last year.

Interests outside of track are few although he follows other sports. Domestically, despite what his partner says, he claims to do ALL the cooking!

Born 17th June, 1979, Chris still has time on his side to reach the top and at 181cm tall seems tall enough to hold his own in tough races, he admits to one weakness however. He likes his food and can put on the kilos when not in full training.

Wythenshawe, 31.5.03. GEORGIE CLARKE (Australia, 96), HAYLEY OVENS (75), DIANNE HENAGHAN (72) and BEV JENKINS (79) in the 3,000m. photo by Mark Shearman.

Steve Scott's Training Log

1981

9/7: 5mi bad cold
9/8: 5mi
9/9: 10mi
9/10: AM 5mi PM 10mi
9/11: AM 5mi PM 10mi
9/12: 10mi
9/13: 10mi
Week: 70 miles

9/14: AM: 7mi at good pace. PM 7 Hard
9/15: 10mi
9/16: AM 5mi in PM 10mi fartlek
9/17: AM 10mi PM 5mi
9/18: PM 10mi
9/19: AM 5mi PM 10mi
9/20: 10mi
Week: 90 miles

9/21: AM 5mi. PM Warmup, did 3x(330-220-440) @ :60 pace, warmdown
9/22: AM ran 5mi. PM 5mi.
9/23: AM 5mi PM warmup, 220 @ 27, then 880 in 1:50. Felt good, under control, warmdown
9/24: AM 5 mi Fly to NY.
9/25: AM Ran the course and a little more PM ran 10mi. John, Tom, and Ray. Nice run.
9/26: AM 5th Avenue Mile. 3mi in the morning. Jogged warmup. Got 7th 3:53.8. Felt okay till last 400. Ran CP loop for 7mi.
9/27: AM 10 with Walker PM 5 mi
Week: 85 miles

9/28: 15mile hills
9/29: AM 5mi PM 5mi
9/30: AM 5mi PM 10 mi
10/1: AM 5mi PM 10mi
10/2: AM 5mi PM 10mi
10/3: AM 5mi very slow PM 10mi
10/4: AM Central Park 5k. Jogged to start of race. Ran 13:50 for 5km around park. Jogged around the park after. PM 6 mi
Week: 97 miles

10/5: PM ran 10mi
10/6: AM 7mi PM 3mi
10/7: AM 5mi PM 10mi felt bad very hot
10/8: AM 5mi PM 10mi
10/9: warmup, 3x(3x1000m) w/ 500m jog Avg. 2:49, last one in 2:40., warmdown 10/10 AM 5 PM 5

Glasgow, 24.1.04. KELLY HOLMES. photo by Mark Shearman.

10/11: AM MetroCenter 10km. 2mi warmup/ cooldown. 1st 29:26. PM Ran 5mi in evening.
Week: 86 miles

10/12: PM 10mi
10/13: AM 5mi PM 10 mi hard fartlek
10/14: AM 5mi PM ran 10x Sage Dr. hill. Very tired. Ran home from hill. Very hard workout. Felt like shit!
10/15: AM 5mi PM 8mi
10/16: AM 5mi PM 7mi
10/17: AM 5mi PM 5mi
10/18: AM 8mi PM 2mi
Week: 85 miles

10/19: PM 8x1000-500m. 3min 5min. Avg. 2:47 last 2:42. 1:22 fast 1:10. Was hot, good workout. Ran home.(14mi)
10/20: 15mi run out the canal. Good pace.
10/21: Fly to LA for PR stuff. AM 5mi easy PM 5 mi
10/22: PM 20x Roast hill. 11mi
10/23: AM 5mi PM 10mi
10/24: AM 5mi Very sore from stride-outs. PM 10mi at good pace.
10/25: AM 5mi canal loop. PM 10mi up South Mtn. Good, back hard.
Week: 95 miles

10/26: PM Ran up to canal. 10x1000m, 500m jog rest. Avg. 2:47, last in 2:39. Ran back. 15mi
10/27: AM 10mi slow Sore from yesterday. PM 5mi good pace. Lifted at home.
10/28: AM 5mi PM Ran 10mi , pretty quick. Quads still hurt.
10/29: AM 5mi PM 30x Roost hill hard. Was a good workout. Ran home.
10/30: AM 5mi PM 5mi
10/31: 10mi easy southern loop.
11/1: AM 5mi easy. PM 10mi
Week: 90 miles

11/2: 10mi easy.
11/3: AM 5mi PM ran 13mi fartlek up South Mtn. Good hard run.
11/4: AM 2mi PM 10mi
11/5: AM 5mi easy PM warmup, 3x 500-1000-500 2mi rest , 5min between sets. 1:21-2:45-1:24, 1:23-2:47-1:23, 1:23-2:41-1:24. Ran home, good workout.
11/6: AM 5mi easy. PM 5mi easy.
11/7: AM 6mi easy. Went to ASU game.
11/8: Northbank 10k Race was ok, Hunt movedw/ 2mi left. Legs heavy.2nd 28:47.
Week: 85 miles

11/9: 15mi run up South Mtn. Good pace.
11/10: AM 5mi. PM 5mi. Easy.
11/11: AM 5mi @ good pace. Fly to CA. PM 10miler hard w/ Tom.
11/12: AM 5mi easy. PM 10mi easy
11/13: PM 10x Roast hill, very steep.10mi
11/14: AM 5miler. PM Ran Southern loop.
11/15: AM ASU Homecoming 10k. Ran wrong way, tied for 1st w/ Pete. PM 7mi easy.
Week: 95 miles

11/16: 15miler
11/17: PM Hilly ridge workout. 8mi
11/18: AM 5mi PM went to Sage Dr w/ ASU team. 40x120 hills, hard.
11/19: AM 5mi easy. PM 10mi easy
11/20: 15miles on South Mtn, good pace.
11/21: 5mi run.
11/22: DNR - drove to Pinetop. Quail hunting.
Week: 70 miles

11/23: AM 5mi easy PM 10mi good hard 10mi.
11/24: AM 5mi run. PM 10mi run on dirt
11/25: AM 5mi easy PM Ran up South Mtn. w/ Pete. Felt like shit.
11/26: PM 5 miles before dinner. 15 people over.
11/27: Fly to Burbank. TAC clinic. PM Ran over course (wet, muddy, hilly).8mi
11/28: TAC XC. Race ok Ran stupid. 6th: Royle, Salazar, Swede, Rose, Hunt. 12mi
11/29: AM 5mi, PM 5mi easy.
Week: 80 miles

11/30: PM ran w/Matt and Pete 15mi along canal.
12/1: Fly to OC. PM 10mi run. Dinner w/ Sub-4 people.
12/2: AM 5mi easy. PM 10mi fartlek. Spoke at Huntington Beach HS.
12/3: PM 10 miles.
12/4: PM 15mi
12/5: DNR. Fly to Ontario.
12/6: Sub-4 10km. Race was okay. Didn't run tough. Lost 2 guys in last mi. 28:28 PR
Week: 80 miles

12/7: AM 5 miler. Fly to Reno PM 10mi Good pace.
12/8: AM 5mi in Reno. Flew home. Felt like shit. PM 5mi at home.
12/9: AM 5mi. PM 14mi Ray/Pete/Me ran South Mtn hills, good pace.
12/10: Flew to Ill. PM Ran 10mi good pace. Very cold, jaw froze.
12/11: Tested at OD camp. 3mi on treadmill, then hard 10mi w/ Masback, Theriot and Byers. 2mi cooldown.
12/12: AM 55min run with Lacy and Byers. Then ran ? mi for filming.
12/13: AM 8mi run (slow-good-hard), Rolling Stones concert. Stones were great!
Week: 90 miles

12/14: AM 5mi PM 30xhill hard. Good workout, tired.
12/15: AM 5mi PM 10mi
12/16: AM PM 10mi
12/17: AM 3mi PM: Ran to canal for mile repeats: (5:15/4:38)(5:25/4:34)(5:40/4:31)(5:55/4:26) and ran home. Good workout.
12/18: AM 7mi easy. Drove to Victorville to speak with Len. Got home at 2am. 12/19 DNR. Flew to San Diego.
12/20: Festival of Lights 10k. 1st 28:50. Beat Pheffer, Mendoza, Lux. +10mi run. (20mi total)
Week: 85 miles

12/21: 5mi, back of knee near tendons hurt.
12/22: DNR - hurt.
12/23: Hurt. 5mi
12/24: Hard 10mi fartlek in the afternoon.
12/25: DNR - ate too much turkey.
12/26: AM 10mi in the Southills. PM 5mi run.
12/27: AM 5mi easy. PM 10mi Run up in foothills.
Week: 50 miles

12/28: AM 5mi easy. PM 10mi
12/29: AM 5mi, good pace. PM 20xhills, 20 each side and run home, fast.(15mi)
12/30: AM 5mi easy. PM 10mi, felt tired.
12/31: AM 5mi, felt like shit. PM: 5mi
1/1: AM 5mi, PM 5mi felt real strong.
1/2: AM 5mi. PM 10mi easy
1/3: DNR - Flying to NZ
Week: 80 miles

1982

1/4: Ran 10mi
1/5: 11mi run with Walker and Dave. Head spinning afterwards.
1/6: Ran to Cornwall Park. Did 3x400 on the

street. (10mi)
1/7: AM 5mi easy. PM 10mi in hills
1/8: AM 7mi. Easy PM ran 10x300 on grass field w/300 jog. Ran 45s, last in 41. (10mi)
1/9: Flew to Adelaide. PM 5mi easy
1/10: AM 5mi easy. PM 8x200 in 30s + 4mi.
Week: 76 miles

1/11: AM Jogged 2mi easy.110ºF. Beat Ken Martin in 8:36 2mi. (8mi)
1/12: Fly to Melbourne. PM 10mi good and hard.
1/13: 13mi
1/14: AM 4mi easy, PM Melbourne Mile. 1st 3:55.91 Jogged after. (6mi)
1/15: Flew to Sydney. 12mi good, hard pace.
1/16: AM 7.5mi around park PM 7.5mi
1/17: Am 7mi around park. PM 3mi jog.
Week: 80 miles

1/18: AM 5mi easy. PM. Sydney Mile. Race slow through 1200. Kicked like crazy the last lap. 1st in 3:58.8. Walker 0.2s back. 10mi
1/19: Flew to Christchurch. 13mi good hard
1/20: 8miles Hard PM 7mi fartlek.
1/21: AM 7mi easy, tired from yesterday. PM 3x(400-200). Hamstring hurt during last 200, finished anyway.(56-25)(59-27)(58-27). 10mi
1/22: Hamstring hurts, got therapy. 5 miles easy.
1/23: AM 5-6mi easy. PM Christchurch 1500m. Raced as plan, went w/rabbit, Walker boxed. Won in 3:37.8.
1/24: AM 11mi in the park. Good run. PM 5mi easy.
Week: 80 miles

1/25: John and I ran 7-8mi around airport. Left at 2pm.
1/26: AM 6mi easy. PM Hamilton 1000m. Race was okay, wore flats, hard track. 4th in 2:20.1. Jogged down after. (7mi)
1/27: AM 11mi w/John. Drove to Lake Tarawera. Caught 6lb1oz trout!
1/28: 10mi
1/29: AM 7mi with John. Hot and muggy. PM 3mi easy + strides.
1/30: AM 3mi easy. PM Auckland Mile. Race was good, slow early, 51 last lap. Won in 3:54.8, Walker made surge with 700 left. Went home.
1/31: AM 5miles. PM 13miles in the foothills.
Week: 75 miles

2/1: Sub-4 stuff all day. Ran good 10miler with Wysocki.
2/2: AM 5mi PM Went to UCLA, cold and windy. 4x400 (59-60) then 2x400-2x200 all slow. Jogged. (5mi)
2/3: AM 5mi easy PM 10mi very hard
2/4: AM 5mi. PM 5mi.
2/5: AM Ran 3mi easy. PM LA Times Indoor Mile. Race was a real bummer.Not committed, bad attitude. Was in position but never moved. No confidence. 4th 3:58 Padilla-Walker-Flynn. (7mi)
2/6: Drove to AZ. 15mi in the foothills.
2/7: AM 5mi good pace.
Week: 75 miles

2/8: DNR - Moved into new house
2/9: Fast, quick track workout. 4x150 then 4x150, 4x200, 3x300 +3mi jog. 10mi
2/10: DNR - Flew to San Diego for promotional work. Got home late.
2/11: No AM run. Flew to NY. PM ran 5mi in the Park. Cold.
2/12: AM 3mi. PM Wannamaker Mile. Race was great. Lead after 440. Beat Byers by .04s Won in 3:55.3. (7mi)
2/13: AM 3mi in NY. Flew to Ottawa. Ottawa Indoor Mile. Race was bad. Felt like I was fighting. Won in 4:00.3. (7mi)
2/14: DNR Traveled all day.
Week: 35 miles

2/15: Ran 10mi from school. Slept 12-14 hrs. No AM runs this week.
2/16: Warmed up and ran 4x150 w/ 50 jog, 3x300 w/100 jog, 2x400 w/ 200 jog.Great workout! Felt good, under control. Len thinks I can run fast this weekend! 7mi
2/17: Easy 9mi
2/18: Easy 5mi. Left for San Diego.
2/19: AM 3mi easy PM San Diego Indoor Mile. Race was a disaster. Went out too fast the pack stayed back. 56s first 400. Tried to push 3rd 400 instead of settling in. Lost it with one lap to go. 4th in 3:55.0. Walker won in 3:52.8. (7mi)
2/20: SF Mile. Race was a drag. Felt slow, tired. John won. I was 2nd 4:00.2. 6mi
2/21: 10mi in hills Good hard run.
Week: 60 miles

2/22: AM 5mi easy. PM 10mi canal run. Good weights workout,too.
2/23: AM 7mi. PM 2x(500-450-400-350-300) No times given. 400 jog. Great workout. All 58 or faster. 37.9 last 300.
2/24: Had a fever yesterday. Ran 10mi easy.
2/25: Left for NY. Ran around park Very cold (20 below w/ windchill) 11mi
2/26: AM 3mi. PM. TAC Indoors. Race was real bad. Ran uninspired and unwilling. Race was there w/ 2laps to go, wasn't tired. 5th in 4:03.0.
2/27: 13mi
2/28: AM 10mi @ good pace. PM 5mi easy.
Week: 85 miles

3/1: Felt bad today. Ran 10mi + lifted.
3/2: DNR - feel very sick. Fever, runny nose.
3/3: AM Ran 5mi loop - feel awful. PM Ran 10mi hard. Felt bad.
3/4: AM 5mi loop, felt bad, very tired. PM 10mi out an back hard.
3/5: AM 5mi loop pretty hard. PM ran 30xRoost hill and home. Great workout! (10mi)
3/6: AM 10mi PM 5mi easy.
3/7: Laguna Beach 10k. Won in 29:26. Kicked hard last 440. 10mi
Week: 80 miles

3/8: AM 5mi hard. PM 10mi hard .
3/9: 5mi PM 10mi Hard fartlek from house.
3/10: PM 10mi easy + lifting
3/11: AM 5mi PM 10mi South Mtn Hill loop.
3/12: PM 10 mi, weights Tired.
3/13: 30x110y on Sage dr. Hill. Very hard. 15mi
3/14: 15 mi easy
Week: 95 miles

3/15: AM 5mi easy. PM 10mi easy. Lifted after.Good lifting.
3/16: PM 10mi fartlek with Pete. We were flying!
3/17: AM: Ran 5mi easy. PM 10mi to golf course and back
3/18: 12mi the Southern Mtn. loop. Went very well, hard up the hills. Weights.
3/19: AM 5mi loop. PM 10mi hard out camelback run. Felt great!
3/20: 10mi easy
3/21: AM 4mi easy. PM Did 30xSage Dr hills, ran back. Hard, great workout. (13mi)
Week: 95 miles

3/22: PM real easy 10 mi. Weights.
3/23: AM 5mi PM 10mi hard run. Supposed to be fartlek, tired at beginning, picked up to be fairly good run.
3/24: AM 5mi PM 10mi hard fartlek, fast/steady coming back.
3/25: PM Very tired. 10mi easy + Weights.
3/26: PM 10mi slow
3/27: AM Ran to Sage Dr. 15x200 hills. (13mi) Was a real bear! Great workout! Better than running the shorter ones. PM 5mi Quail loop.
3/28: AM 5mi PM 10mi canal loop. Left for NZ.
Week: 93 miles

3/29: DNR Flying to NZ.
3/30: AM 7mi. PM 8mi
3/31: AM 5mi w/ Ray, good pace. PM 10mi hard, Weights.
4/1: AM 5mi easy around the park. PM 10mi Very tough, hilly w/ Ray, John.
4/2: AM Easy 5mi. PM Easy 5mi with Ray + strides.
4/3: Auckland (road) Mile. 1st in 3:31.2. Beat Hillardt, Flynn, Walker. + 10mi after. (14mi)
4/4: AM 15mi with John + run home.
Week: 85 miles

4/5: PM 2mi time-trial 8:53. Felt ok, hot & windy + 5mi. (10mi)
4/6: AM 5mi easy. PM 5mi easy.
4/7: AM 5mi PM 5x200 w/200 jog, 1x1000-1x600-2x550-3x500-4x450-1x1000. Great workout, all 59-63pace.(10mi)
4/8: AM 5mi PM 10mi hard Weights.
4/9: AM 5mi PM 10mi easy Tired from yesterday.
4/10: AM 20x110 hills then ran home.(11mi) PM 3-4mi.
4/11: 15mi Good, hilly run.
Week: 95 miles

4/12: DNR - drove from CA to home.
4/13: AM 5mi PM 4x(660-660-440) w/ 220j, 110w. 440w between sets. 1:32-1:30-55.2, 1:30-1:31-54.5, 1:31-1:32-54.0, 1:33-1:30-53.8. 5mi cooldown. (15mi.)
4/14: AM 5mi PM 10mi easy loop. Very sore from yesterday. Weights.
4/15: AM 5mi felt good. PM 10mi fartlek, real good workout!
4/16: PM 5mi easy
4/17: AM 5mi PM Bruce Jenner Mile. Race was a bore. Last 200m kick. 1st 4:01.3
4/18: AM 5mi PM 15mi long run.
Week: 85 miles

4/19: 8x300 (47.5avg) 100j, 200j 1x400 (54.3), 400w. 16x200 (31.5avg) 100j, 100w. 1x400 (51.9). Good 5k type workout. Felt good. (10mi)
4/20: AM 5mi PM 10mi hard over hills. Weights.
4/21: AM 3mi easy. PM Good 10mi run. Played golf, shot an 89.
4/22: Left for Des Moines. 7mi + strides.
4/23: AM 3-4mi. PM Drake Relays 5000m. Race was ok, windy. Won in 13:52. Lead after 1mi, hurt in later stages. Jogged 5-6mi after. (11mi)
4/24: AM 10mi run in Des Moines. Went to meet. Flew home.
4/25: AM 5mi. PM 5 sets of 4x110, 1x220 hills. Ran home long way. (15mi)
Week: 90 miles
4/26: AM 5mi PM warmed up with ASU, ran 8mi. Felt like shit, feel like a cold is coming.
4/27: No AM run, felt bad. PM felt better. 2x600-500-450-400-350 all sub60 pace. Last 400 in 51.1 3mi warmup, 2mi cooldown. (8mi)
4/28: AM no run. PM 10mi Weights.
4/29: AM 5mi PM 10mi hard 52:00
4/30: AM 5mi PM 10mi, easy out, hard on return.
5/1: AM 4mi PM 9mi Weights.
5/2: 15mi South Mtn run w/ Pete.
Week: 91 miles

5/3: AM no run. PM 10mi easy + weights.
5/4: AM 5mi, felt real bad. PM 3x400 (58.4) w/ 200j, 800w, 800 (1:54.5), 400w, 400 (52.4). Easy workout. (7mi)
5/5: AM 5mi PM 10mi easy.
5/6: AM 5mi PM 2x(2x400-600-400-8x200) workout was great all times fast! (10mi)
5/7: AM 5mi. PM 5mi Drove to CA. Weights.
5/8: AM 10mi PM 2mi, golf - shot a 92.
5/9: 15mi run with John in the foothills.
Week: 85 miles

5/10: Felt really bad. In LA for promo work for Al Franken. Stopped at Cal Poly for easy 5mi, felt terrible.
5/11: AM 5mi PM 10mi
5/12: @ UCI. 2x400-800-400-6x200-3x400. Very good workout. 57-58, 1:54-58, 29s, 55-58-52. Jogged 6mi after. (13mi.)
5/13: AM 5mi PM 10mi easy

5/14: AM no run. PM 10mi Good run + strides.
5/15: AM 5mi easy. PM 5mi easy.
5/16: AM 3mi. PM Pepsi Mile. Race went well. 1200@3:00, 3:52.68. Paige was good. Jogged 6mi after.
Week: 80 miles

5/17: AM 10mi felt real bad on run. Legs hurt from volleyball.Smoggy.
5/18: AM 5mi hard PM 10mi real hard fartlek. Great run, windy on return.
5/19: AM 5mi good pace PM 10mi good pace. Weights.
5/20: AM 5mi Felt tired, sore. PM 10mi real easy.
5/21: AM 5mi loop good pace. PM 3x(400-800-400) 200j, 400x b/sets. 58-1:56-58, 58-1:58-57, 58-1:57-55. Good workout, not real hard.(8mi)
5/22: 10mi. Easy, moderate
5/23: AM 5mi.
Week: 85 miles

5/24: AM 5mi PM 10mi (3.5 hard, 3 easy, 3.5 very hard) good run.
5/25: AM 5mi easy, a little tired. PM 4x(400-350-300-250-200) 55.8-50.3-42.6-36-27.4 23.6 last 220. (8mi)
5/26: AM 3mi very easy PM 10mi easy
5/27: DNR - got home very late.
5/28: AM 5mi PM Sage Dr hill. 5x (4x100 1x200 uphill) good hard workout. Ran out and back hard. Weights. (15mi)
5/29: 10mi w/ Pete. Went tubing, had fun.
5/30: AM 5mi PM 10mi.
Week: 85 miles

5/31: AM no run. Big toe hurts. PM Good session for 800m this week. Ran 3x300, 4x250, 5x200 w/ 100w, 150j, 200j, 200w b/sets. 39s/26s all at pace. (7mi)
6/1: DNR - Hip is very sore and big toe hurts.
6/2: AM 5mi hip is still sore but ran anyway. PM 10mi good pace, Weights.
6/3: AM 5mi, feel better. PM 300-200-400 (39.0-26.4-52.6). Feel tight, not real controlled. (8mi)
6/4: Went to SF for Al Franken promo work. Raced cable car uphill. Jogged. 5mi
6/5: AM 2mi jog. PM Prefontaine Classic. Race was easy, 1:46.64, outkicked them in last 100. Ran 2mi after.
6/6: 10mi easy run with John G.
Week: 70 miles

6/7: AM 5mi at good pace. PM 10mi. Good, hard.
6/8: AM 5mi easy felt sluggish. PM (500-200-400)(450-175-350)(400-150-300)(350-100-250) w/ 200j, 200w b/sets. 1st 3 sets all 53 pace or better. Last at 51 pace or better. Great workout. (7mi)
6/9: AM 5mi PM 5mi
6/10: AM 5mi. PM DNR Flew to Ontario (Cal).
6/11: 6mi run w/ John and Pete. Flew to Oakland.
6/12: AM 3mi PM Kinney Invite, UCB. Race was a bummer. Felt bad. 1st 3:54.1, Walker 2nd, Flynn 3rd. 6mi after. (10mi)
6/13: 16mi run in hills around Berkeley w/ Walker. Flew to Phoenix.
Week: 77 miles

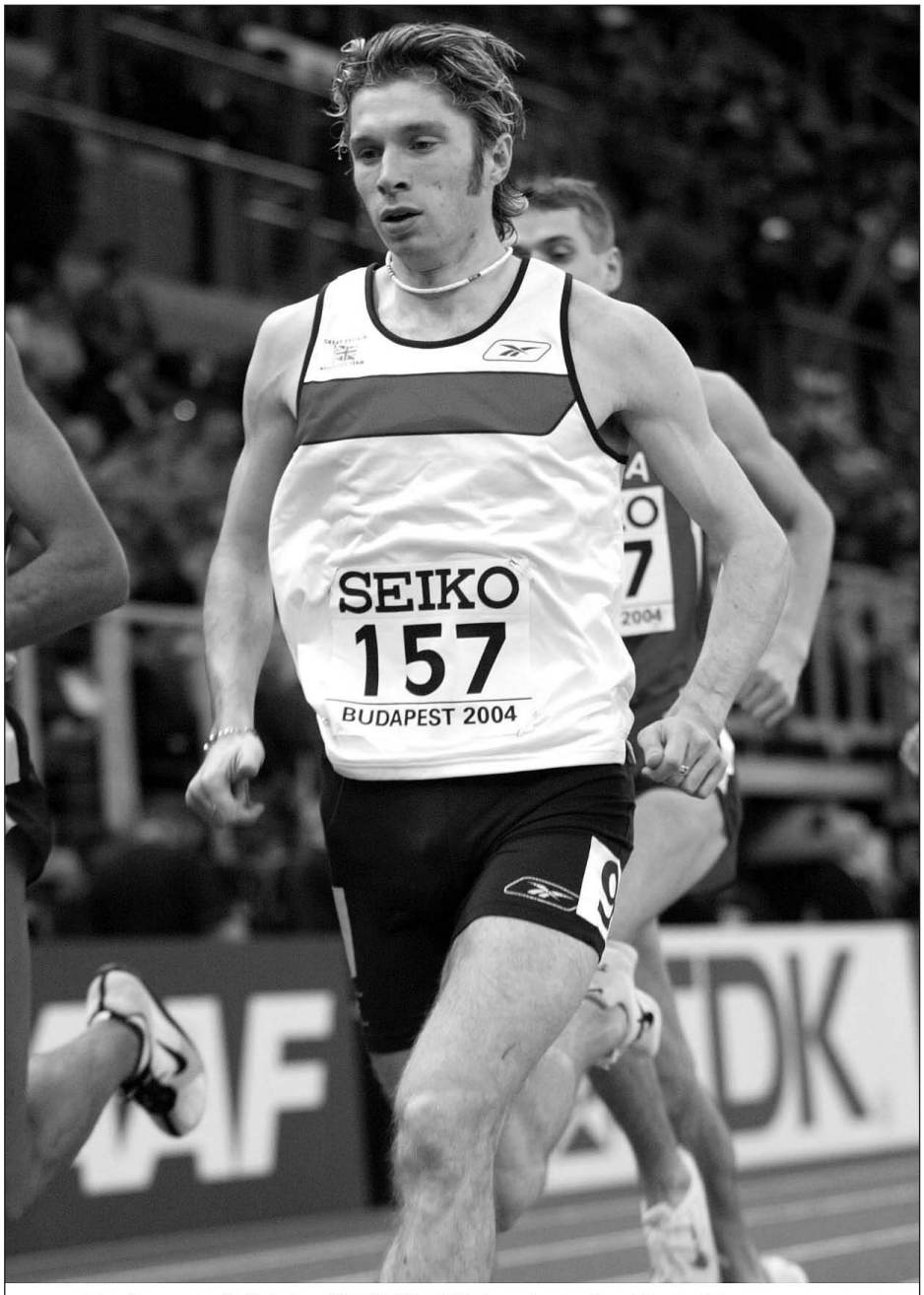
6/14: 10mi easy, tired from yesterday. Long drive to Upland.
6/15: 5mi to stereo place to pick up car. Ran 5mi more later.
6/16: AM 5mi PM Ran 10x200 w/ 200j on grass. (5mi)
6/17: Flew all day. Ran to track and did some strides and ran back. 6mi
6/18: AM 2-3mi PM TAC 1500m heats. Won in 3:39.99. Very easy.
6/19: AM 3mi easy
6/20: TAC 1500m Final. Race was fast. Won in 3:34.92. Fricker led in 2:54, I took lead w/ 300 to go. Maree 2nd, Flynn 3rd.
Week: 58 miles

6/21: AM 10mi PM Flew to Oslo
6/22: AM No run PM 10mi hard in the hills above the lake. Nice day.
6/23: AM Ran 2 lake laps. PM Ran around the lake + 11x140 hard strides. (9mi total)
6/24: AM Ran @ lake PM 5x200 in 26-27 w/200j. Felt good. (8mi total)
6/25: No AM run. PM 5mi around the lake.
6/26: AM 3mi PM Bislett Mile. 1st Oslo win. Perfect conditions, can go faster. 3:48.53 AR, Maree 3:48.85, Moorcroft,Walker. Ran 5mi after. (8mi)
6/27: 15mi in the hills w/ John, Steve and Ray. Wet, cold but nice.
Week: 70 miles

6/28: AM 5mi easy PM 3mi + 9-9x150 good strides. (5mi)
6/29: AM 6mi around the lake + strides. PM flew to Budapest.
6/30: AM hilly 3mi PM Budapest 1500m. Race was good, felt tired before, windy. 56-1:55-2:55, 25 last 200. 1st 3:35.75, Walker 2nd. (4mi)
7/1: AM Flew to Oslo PM 10mi w/ Mark Fricker, good pace. Felt good.
7/2: AM no run PM 6x220 in 25-26, tried to float. Good workout. 8mi

7/3: Ran to track, watched races, ran home. Feel good. 10mi
7/4: AM 2mi PM Byrikjelo 800m. ran 1:45.05 PR. 1st lap fast 51, finished good. Walker 2nd. (8mi)
Week: 61 miles

7/5: AM flew to Oslo PM 8mi around lake 3 times plus some strides.
7/6: AM no run. PM 6mi 2 times around the lake +strides. Easy.
7/7: AM ran around the lake. PM Oslo Mile. Race was very good. Not so hard. Didn't move quite early enough. Felt under control. 57.3-1:53.8-2:51.9-3:47.69 AR Walker 2nd 3:49.08, Ray 3:49.77
7/8: 5mi
7/9: AM 3mi around park PM Paris 800m. Slow 1st lap even slow 3rd 200. Kicked hard in home straight, felt fast and strong. Beat Robinson 1:45.28-1:45.80. (5 mi)
7/10: AM flew to Lausanne. PM 10mi, hot, humid, smoggy.
7/11: 8mi along the lake + strides, jogging, push-ups, sit-ups. (10mi total)
Week: 58 miles



Budapest, 6.3.04. JAMES THIE. photo by Mark Shearman.

7/12: AM 5mi jog. PM 5x200 25-27s w/ 200j-w. (5mi)
7/13: 5mi w/ John, Mark & Doug in nice shaded park. Walked 3hrs in 90F!
7/14: AM 20min PM Lausanne 1500m. Race was hard. Didn't feel strong before but still went for it. Halfway through just decided to win. Fast 3:32.22, Maree 3:32.7 (5mi)
7/15: AM 6mi easy PM Flew to London.
7/16: 5mi easy in the park, strides and stretched. Not feeling real peppy.
7/17: AM 3mi PM London 3000m. Race was bad. Felt tired from the start. Knew I was in trouble after 1200. 5th in 7:40.5 Moorcroft-Maree-Walker-Koech. (5mi)
7/18: DNR - Flew home.
Week: 45 miles

7/19: AM no run. PM 10mi run.
7/20: AM 10mi, very hot and humid. Felt like shit. PM 5mi Weights
7/21: AM 10mi PM 5mi @ SLO.
7/22: AM 5mi PM 10mi up this big mountain behind hotel. Good hard run.
7/23: AM 5mi PM 5mi at home. Weights
7/24: AM 5mi, was hot. PM 10 x 23rd and 24th Streets. (10mi) Felt good, good run.
7/25: Ran 15mi, hot & muggy.
Week: 95 miles

7/26: AM 5mi PM 10mi Weights.
7/27: AM no run PM 25x110y hills, fast. Good workout. 12mi
7/28: AM 5mi PM 10 mi Very hot, hilly run.
7/29: AM 5mi loop. PM 5mi Feel very stressed, too many interviews! Weights.
7/30: AM 5mi run PM 10mi
7/31: AM 5mi PM 10mi
8/1: 15mi run up to Ranger Station and back.Weights.
Week: 95 miles

8/2: PM 10mi easy.
8/3: AM 5mi jog PM@ SLO 2x(5x400) 400j, 400w between sets. Very good. 55.4, 56.8, 57.1, 56.4, 55.8, 55.1, 56.8, 56.2, 55.8, 52.8. (10mi)
8/4: AM 5mi PM 5mi jog, smoggy as hell, felt like shit.
8/5: AM 5mi PM 10mi in foothills up the back. Weights.
8/6: AM no run PM 600-500-400, 500-400-300, 300-200-400 all at 56.5 pace except first 500. Last 400 in 51.0 Great workout. ? int. jog b/intvls., 400w/sets. 10mi
8/7: AM 10mi 1:00:00
8/8: AM 5mi PM 10mi in foothills.
Week: 85 miles
8/9: AM no run. PM (2x400)(800-400)(6x200)(3x400). 56.8/57.1, 1:53.6/58, 28s, 56.6/58.0/53. Great workout, felt good. 10mi
8/10: AM 5mi PM flew to Europe.
8/11: PM hard 5mi run, very hot and humid. Slept bad.
8/12: 5x200 26-27 last relaxed in 23.8. 6mi Noticed pain in my side
8/13: 5mi. Jog Chest very tight today, could barely breathe. Side very sore.
8/14: Nice 2000m. Stomach cramps all day. Bad race, luck it was slow. John barely beat me. 4:58.72 AR. 7mi
8/15: Flew to Zürich. Tried to run, side hurt badly. Took day off.
Week: 38 miles

8/16: Jogged 5mi. My side still hurts, I saw 3 Docs and all said something different. Feels better, though.
8/17: 5mi with Walker and Flynn. Felt much better today. Slight pull in my back by my shoulder blade.
8/18: Zürich 1500m. Ran like a turkey. Felt like I was going to tie up with one lap to go, but I didn't. Got passed on last 100, responded well but was boxed. Faded to 3rd behind Cram, Harbour. 3:34.18
8/19: AM flew to London. PM 5mi with John.
8/20: AM no run. PM London 1000m. Felt ok during warmup but ran like I was afflicted. Last 200 rigged very bad! No warmdown, got drug tested. 2:20.4 Cram won
8/21: 6mi @ 40min, felt good. Flew to Germany.
8/22: Köln 800m. Felt much better, got too far behind, didn't tie up, finished strong. 1:46.67 4th place. 8mi
Week: 42 miles

8/23: 8mi @ 50min with John.
8/24: PM 6mi w Ray some 150s. Felt good.
8/25: AM 3mi PM Koblenz Mile. Race was good, gave 100% last 200. 56-1:54-2:53.5 Sydney and I battled last 200 shoulder-shoulder; won 3:49.72-3:49.75. (6mi)
8/26: AM Took train to Brussels. PM 5mi (30min) felt very good.
8/27: Rabbitted 5000m for Walker. Set pace 7:55 for 3000m. 7mi
8/28: 7mi (45min) run with John and Ray. Left for Stuttgart.
8/29: Stuttgart 1000m. 2:17.58, beat Byers and John. Felt good. 3mi
Week: 45 miles

8/30: 7mi (42min), felt good.
8/31: AM Ran w/ Thomas. PM Ingleheim 2000m. Race was OK. Didn't have anything left on last lap, lost contact. No desire.Too many races. Thomas won in 4:52.2. I was 2nd 4:54.71 PR. 7mi
9/1: Flew to NY. 7mi in CP
9/2: 9mi Ran 3 laps, last was fartlek. Feel good, adjusted to time.
9/3: DNR - Interview ran very late.
9/4: AM 3mi easy PM 5th Avenue Mile. Race was slow 2:58 1200m kicked hard from 200, stepped in pothole. Byers won in 3:51.3, I was 2nd 3:51.5. John and I ran 7.5mi after. (10mi).
9/5: 11mi (60min) with John around the park, pretty fast. Flew home.
Week: 54 miles

52 week mileage: 4016 miles (77.2mi/wk)

43 Races

7 x 800/1000's
2:20.1 / 1:46.64 / 1:45.05 / 1:45.78 / 2:20.4 / 1:46.67 / 2:17.58

6 x 1500's
3:37.8 / 3:39.99 / 3:34.92 / 3:35.75 / 3:32.33 / 3:34.18

18 x Miles
3:53.8r / 3:55.91 / 3:58.8 / 3:54.8 / 3:58.8i / 3:55.3i / 4:00.3i / 3:55.0i / 4:00.2i / 4:03.0i / 3:31.25r* / 4:01.3 / 3:52.68 / 3:54.1 / 3:48.53 / 3:47.69 / 3:49.72 / 3:51.5r

2 x 2000's
4:58.72 / 4:54.71

2 x 3000's
7:40.5 / 7:55h (rabbit)

1 x 2 mile
8:36.6

2 x 5k's
13:50.4r / 13:52

5 x 10k's
29:26r / 28:47r / 27:53XC / 28:28r / 28:50r

Steve Scott ran sub-4 well over 130 times! He had a long and successful career although suffered, as did others, from peaking at the same time as Walker, Coe, Ovett and Cram.

By miling standards, and I invite comments, he appears to have clocked big mileages in the winter and arguably, in the summer. Note lengthy post race runs. He showed good road 10k times but did not appear to have followed that event to the track.

My guess at names . . . John Walker, Thomas Wessinghage, Doug Padilla, Mark Fricker, Sydnee Maree, Ray Flynn.

Comments on Scott's training please to crouch_leslie@hotmail.com

Basic Principles of Training at High Altitude

By Felix P. Suslov, Russia

Based on 40 years experience of altitude, the author offers practical advice in regard to training at different altitudes, the structure of altitude training and transition to sea-level.

INTRODUCTION

In Russia we use altitude training as a means of raising performance capacity in competitions taking place at low altitudes. In this way, the athletes are influenced by a complex of climatical and geographical factors, together with the training and competition loads.

I have collected substantial practical and experimental material over the last 40 years, which leads me to the conclusion that training at heights of around 1200-2600m is quite effective, both for young and for seasoned athletes specializing in running at all distances, walking, jumping, throwing and multi-events.

GENERAL INFORMATION

The improvement of performance upon returning from altitude may be attributed to an increase in aerobic and anaerobic productivity, economy of work and the general and specific endurance of the organism (Figures 1, 2 and 3).

At altitude there is a considerable increase in maximum strength and power. We can observe an improvement in fine neuromuscular coordination, which enables the athlete to overcome the speed barrier. We note also an improvement in the reaction to moving object and in precision of movement. These positive changes persist for some eight weeks after returning from altitude (Figure 4).

In practice we define the following altitude heights:

Low - up to 1200m
Medium - from 1300 to 2500m
High - over 3000m

At present it is debatable whether it is expedient to use heights in excess of 3000m.

High altitude conditions put athletes of different specialities in an unequal situation in regard to two factors - speed of movement and duration of work. A reduction in air density leads to a lowering of air resistance but diminishes the organism's supply of oxygen.

In the sprints, jumps and throws, where speed of movement is vital but the share of aerobic processes in providing energy is insignificant, performances improve at medium altitudes. In endurance events, where aerobic mechanisms for supplying energy play a fundimental role, performances deteriorate.

The time the athletes have been at altitude and their overall preparation are both crucial factors affecting the speed of aaptation and the possible increase of the training loads. When training at altitudes of above 2500m, the length of the "acute" phase of acclimatization, and, therefore, that of the first two microcycles, should be increased.

PRACTICAL APPLICATION OF ALTITUDE TRAINING

The positive effect of training at medium and high altitudes is concerned with the determination of the tasks to be carried out. We may identify three ways of using altitude training:

- In preparation for competitions due to take place at medium and high altitudes, several training periods of from 20 to 35 days duration at altitude are needed during the annual training cycle, in order to adapt the organism effectively. During these periods one shoud plan a gradual increase in the load intensity, thereby ensuring a steady and reliable adaptation to the action of climatic factors and the training loads.
- In preparation for competitions due to take place at normal heights, less frequent and shorter periods of altitude training are needed but the load intensity should be progressively increased for each period. The dynamics of work capacity should be strictly controlled during these periods of re-acclimatization.
- In preparation for a series of competitions taking place at varying heights, such as we encounter in the case of winter sports, additional research is needed for us to form any firm conclusions.

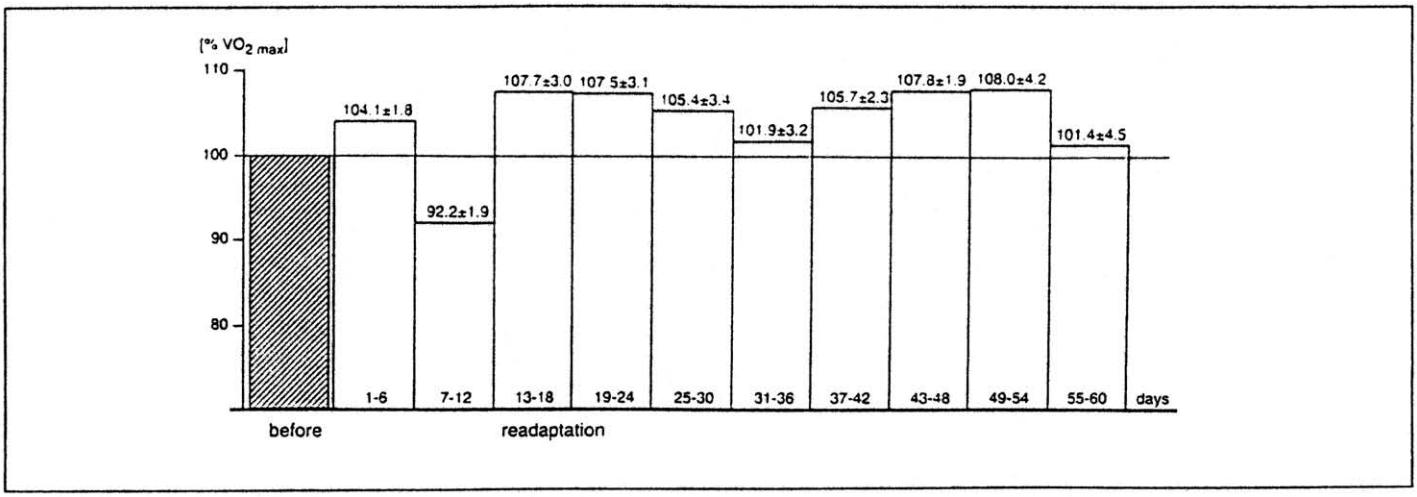


Figure 1: Dynamics of the maximal oxygen utilization (VO_{2max}) in runners after training at 1800m altitude (n=20).

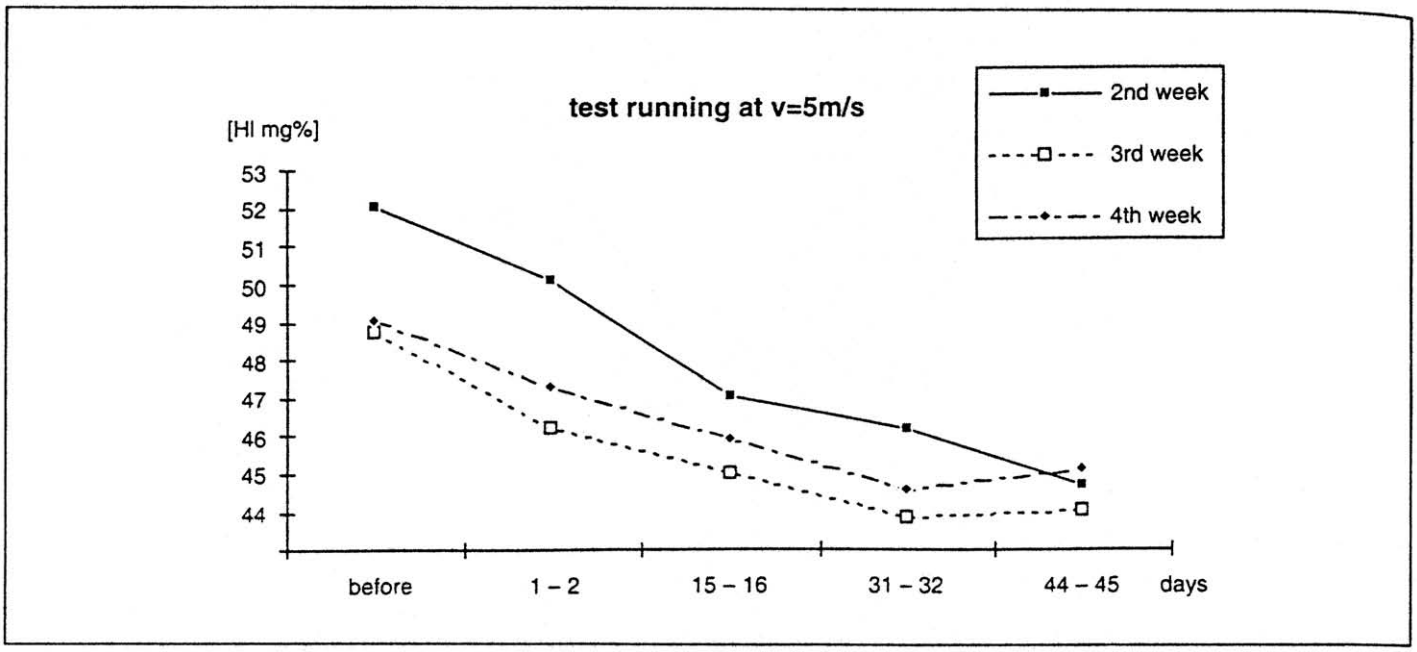


Figure 2: Dynamics of blood lactate concentration in runners at standard loads after training at 1800m altitude of 2, 3 and 4 weeks duration (n=21).

OUTLINE OF THE TRAINING PHASES

During the first few days at an altitude training camp, we observe a considerable deterioration in the general condition of the athletes, shown by a decreased work capacity in tests and competitions. This is due to:

a) A reduction in lung ventilation, the maximum and current supply of oxygen and in the anaerobic threshold (Figure 3).
b) A rise in the work pulse rate (up to a height of 2500m).
c) A fall in the indicators of the oxygen debt incurred with a maximum load of submaximal power.
d) Laboured coordination and an increase in the time of both simple and complex motor reactions.

During the preparatory period, when training loads are high in volume and moderate in intensity, hardly any acute negative symptoms can be observed.

During the competitive period, however, which is generally characterised by a moderate volume and a higher intensity, the negative symptoms are more acutely expressed.

During the first microcycle (5 to 9 days), the load intensity is considerably reduced by means of an increase in the length of the rest intervals and the amount of work of an alactic and aerobic type. We do not recommend competitions at this time.

In the second microcycle (3 to 7 days), the load intensity gradually increases, until, in the third and fourth microcycles, normal training is continued, in accordance with the current stage of training.

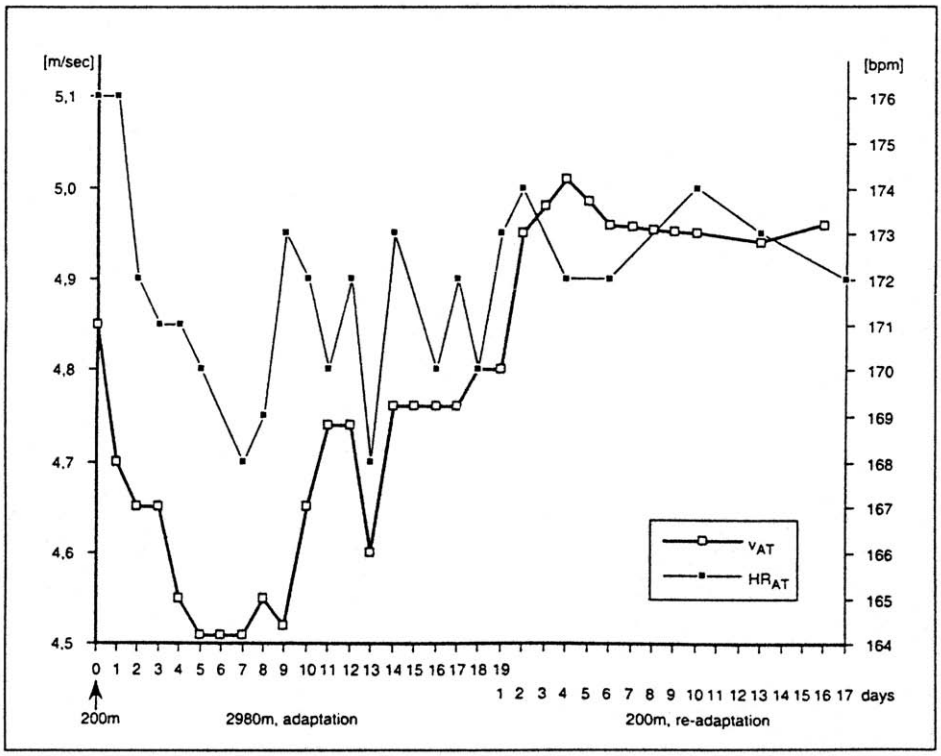
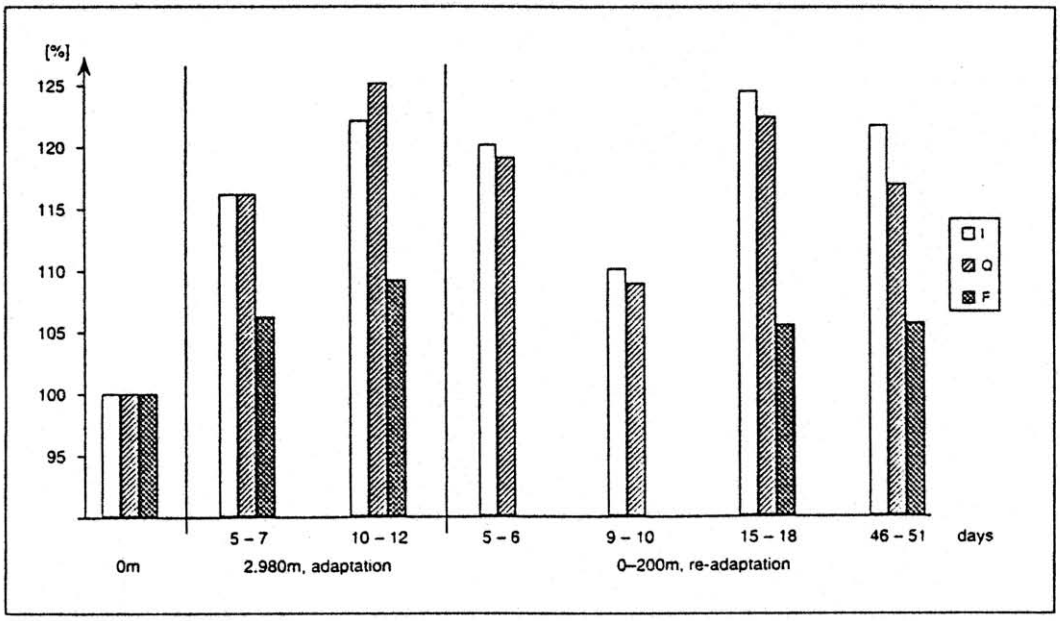


Figure 3: Dynamics of speed at the anerobic threshold (AT) of a long distance runner (Conconi-test).

RESULTS

The results of many years of observation show that, during the period of reacclimatisation after a two to five weeks stay at altitude, work capacity, in terms of competition and test indicators, has an undulating character.

The first few days after returning from altitude are affected by problems relating to travel and perhaps, a change in the time zone.



$$I = \frac{F_{max}}{t_{max}} \quad Q = \frac{0.5\ F_{max}}{0.5\ t_{max}}$$

F_{max} is the maximal force, t_{max} is the maximal time, factor 0.5 is the first half of the total incination of the force-time-curves; F=performance

Figure 4: Dynamics of strength parameters of triple jumpers before and after altitude training. (n=12)

During days 3 to 7, the first phase of enhanced work capacity may be observed, often followed, during days 8 to 10, by a phase of reduced performance (Figure 5).

Starting with days 12-13, work capacity continues to improve and the best performances are achieved on days 18 to 20.

During the fifth week, the work capacity falls off a little but, between days 36 and 48 after returning from altitude, a new upsurge in performance appears.

These dynamics of work capacity are associated with the level of the training loads performed at altitude. Low intensity training has the effect of greatly reducing variations in work capacity during the re-acclimatisation phase. High intensity work has the opposite effect; not only does it increase these variations but it may sometimes even destroy the three phases of enhanced work capacity.

TIMING

Training at altitude should harmonise with previous and subsequent training and it should be concerned with meeting definite, consistently connected tasks. In preparing for competitions to be held at altitude, there should be frequent periods of altitude training.

When preparing for competitions to be held at low-lying venues, altitude training may be carried out two to four times a year. The optimum duration is two to four weeks (five to six weeks for the marathon and the 50 kilometre walk). Longer training camps do not produce the desired improvement in work capacity. Shorter camps may be used during the competitive period, as 'shock' training or for rehabilitation.

During the transitional period, it is reasonable to use visits to sites at medium altitude for 'active rest'.

In the preparatory period, altitude training is employed after the athletes have reached their maximum training load volume at sea level. This facilitates a further rise in endurance and strength. The same principle applies in the pre-competition period, when there is a transition to training loads of high intensity.

During the competition period training at medium altitude may be used, as preparation for more important competitions.

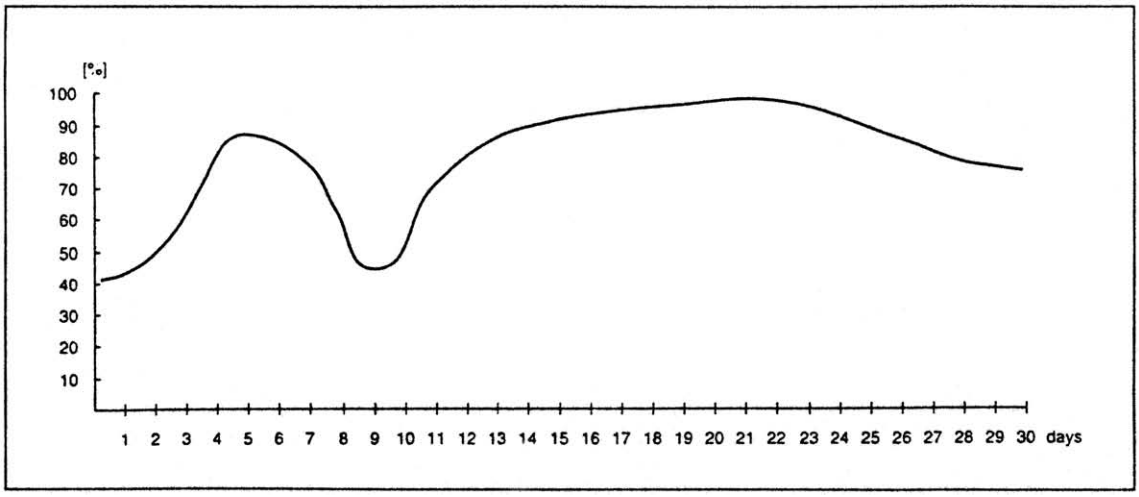


Figure 5: Dynamics of competition performance of middle and long distance runners after medium altitude training (~100 results).

How to Understand Training

By Dr. Atko Viru, Estonia

Professor Viru of the University of Tartu, Estonia, well-known internationally for his contributions to the theory of training, presents a simplified and graphically illustrated summary of the factors involved in the adaptation of the organism to training.

It is widely accepted that training consists of systematically performed exercises in order to improve the physical capacities and acquired technical skills of an event. Experience and, to a certain extent, the results of related studies suggest to the coach what are the appropriate exercises. The testing of physical capacities, the visual evaluation of technique and, above all, the competition results, will indicate how effective the training exercises have been (Figure 1).

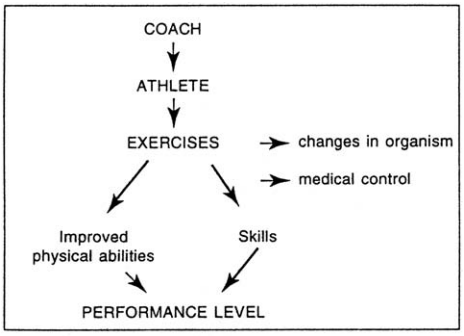


FIGURE 1

The same scheme is presented with a small modification in Figure 2. The modification consists of the additional changes in the organism that occur as the result of the performed exercises. It appears that Figure 2 represents only a small modification that emphasises physiological knowledge. However, this modification actually means a principal change in the approach, as the new approach is based on the following established facts in physiological and biochemical studies:

1. Good performances, and top results in particular, are due to the changes in the organism that distinguishes between the "Homo Olympicus" and a secondary person, "Homo Sedentarius".
2. Certain changes are necessary to improve physical capacities, to acquire technical skills, and to achieve an extensive mobilisation of the organism's motor potential during competitions.
3. The character, intensity and duration of training exercises, as well as the peculiarities in the involvement of various muscle groups and motor units, determine the adaptive changes in the organism when the exercise is systematically repeated.
4. The specific dependence of the changes in the organism on the employed exercises is based on the exercise-induced adaptive protein synthesis. The metabolic and hormonal changes during and after the exercise are the inductors for the specific synthesis of proteins that assures an increase in the most active cellular structures and an increase of the enzyme molecules catalysed in the metabolic pathways.

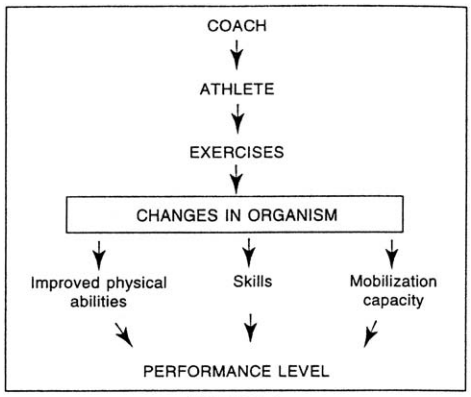


FIGURE 2

The idea of the scheme in Figure 2 therefore indicates that each training exercise results in specific changes in the organism which are necessary to obtain the objectives of training. Collectively the changes caused by the various exercises assure an increased performance level.

The advantages of using this scheme in the practical organisation of training are:

- Each exercise will be performed in order to achieve a concrete objective in the form of a certain change in the organism.
- The resulting changes make it possible to check the effectiveness of each exercise (or at least a group of exercises).

"Blind" exercising will be avoided this way and training will become a well-controlled process. However, changes in the organism are not the only objective. They will also serve as means for an operative feedback to control the effectiveness of training (Figure 3).

The feedback from the changes in the organism is more specific in comparison to the feedback obtained from improved physical capacities and competition results. The feedback from physical capacities and competition results is an integral one, summing up the total positive and negative changes that might have occurred during a prolonged period. The conclusions made from this kind of feedback are therefore only relatively truthful, allowing the evaluation of a general trend but not the details of the whole training process.

Carrying out feedback from the changes in the organism is in reality a complicated task. There are two possibilities available to the coach:

- To use the help of sport physicians and special laboratories.
- To be supplied with tests that describe indirectly but with sufficient validity the main changes in the organism caused by certain training exercises.

Whatever the case, coaches must understand the corresponding information in order to use it for the guidance of training processes.

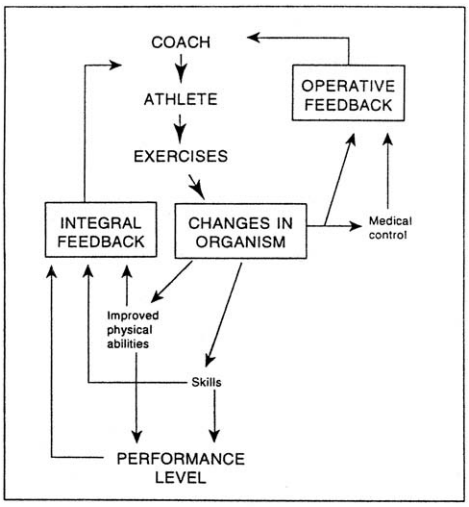


FIGURE 3

The practical use of the scheme outlined above requires an understanding of what are the necessary changes to achieve. The aim or training - a top level performance. This, in turn, leads to an analysis of factors that limit performances in a particular event in order to find the best solution (Figure 4).

Top level competition results depend on training, as well as on genetic characteristics. However, it must be emphasised that there are no genetically induced factors that directly determine competition results in any single event. The positive (or negative) significance of genetic factors become apparent in training. There is an interrelation. Training makes it possible to use genetically induced manifestations in the improvements of performances. At the same time, the effectiveness of training in various directions depend on the susceptibility of the organism to the various training exercises.

The tasks related to the achievement of top level performances have to be rationally distribution over the whole 10 to 12 year period during which a prepubertal boy or girl is developed into a champion. The *training strategy* has to determine how to distribute the tasks, taking into consideration the development of the organism during adolescence. This means that the most favourable age periods have to be found to induce the necessary structural, metabolic and functional changes. The distribution of the various tasks within a year's meso- and microcycles also belong to the strategy of training.

The carrying out of the induction of the necessary changes is part of the *training tactics*, responsible for finding the most rational ways and finally the necessary training methods and exercises.

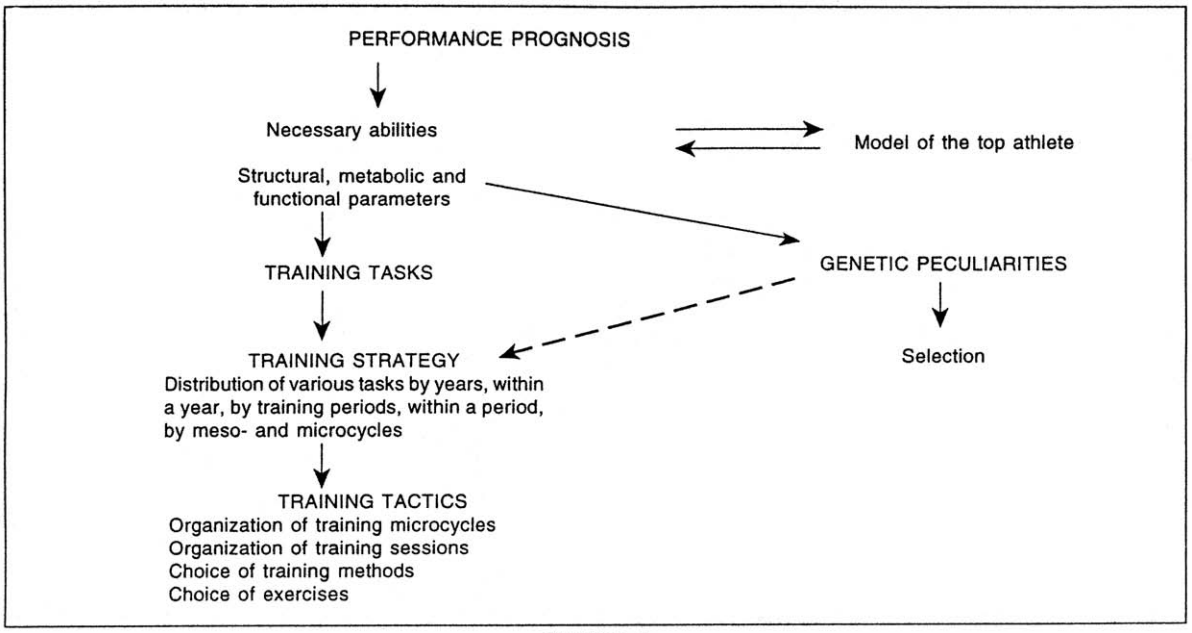


FIGURE 4

Book Review - 3:59.4 The Quest for the Four Minute Mile

This book just has to be the last word on the history of the one mile race and its 'allied' event, the 1500 metres. The author, Bob Phillips, traces the event(s) through 'recordable' time to present day. As the title indicates the main theme is to show how, over two centuries, man was enthused to pursue this Holy Grail, this near impossible, this sub-four minute mile. Here the story is told with panache, with great attention to research and with the feeling that perhaps can only be engendered by one who has done his 'time' on the track. Of particular interest is the period after 1945, which saw the suspension of the world's two leading milers, Haegg and Anderssen, when progress in the mile seemed stalemated. We read how Landy and Bannister, from opposite corners of the globe, closed in on the headline grabbing performance.

The author was able to locate the Reverend G. Dole for interview. Dole was the only American in the race at Oxford as an under graduate, or perhaps a post graduate, and his thoughts fifty years on make fascinating reading.

Attention is paid to, in as far as they are available, training routines of the nineteenth century etc. Tactics used in important races and human aspects of the 'Old Masters' of yesteryear are all mentioned. The names of unlikely candidates for the honour of going sub-four are mentioned but I will leave that to the reader to learn.

The story does not end in 1954, it goes forward from there to the present day and offers the thought that with modern knowledge, tracks etc are today's miling greats really any better than those, like Bannister, who struggled to achieve perfection in an amateur world?

Any student of the mile would be hard put not to have this volume on their book shelf. His/her library would be the poorer without it. The book is of 255 pages, contains 60 photographs and has a forward by Steve Cram. Price at £12.95

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sport@parrswoodpress.com

Triple Entente

2003 was not, it might be argued, our best year for men's 800 and 1500 metre running. However away from the headlines the UK depth continues to be no worse and in the case of Germany better than before. Appended are 2003 listings of world ranking as recorded by January 2004. These are not the final lists, particularly below say 2/300 but are a clear indication of the situation.

It would seem that we have the numbers but lack that little something that throws up the top class performers. When looking at the names of the French athletes one cannot help but think, that from a middle distance perspective, our colonists and explorers of a couple of centuries ago went further afield than was needed.

800	GB	FRANCE	GERMANY
	51	9	35
	61	30	
	66	42	
	87	50	
	101	116	119
	158	162	125
		164	139
		172	182
			198
	210	270	262
	251		271
	265		
	272		
	273		
	285		
	286		
	290		
	294		
	329	334	312
	338	335	314
	356	345	324
			341
			343
			384
			395
	410	424	457
	446	430	459
	447	431	466
	457	436	
	461	448	
	468	455	
	484	470	
	485	474	
	488	486	
	493		
	513	524	522
	517	534	
	523	542	
	538	577	
	596	575	
		594	
	624	603	660
	649	611	
	652	630	
	643	637	
	683	669	
	712	700	721
	730	745	736
	784	761	793
		769	795
		770	
		788	

1500	GB	FRANCE	GERMANY
		2	
	32	5	34
	33	49	77
	72	53	89
	78	84	
		91	
	107	105	121
	125	142	150
	157	149	168
	178		181
	185		
	210	214	202
	211	254	226
	232	261	280
	241	266	
	242	270	
	250	278	
	256	281	
	282	285	
	292		
	313	315	320
	366	353	341
	368	358	347
	379	377	351
	390		367
	397		387
			388
	407	401	446
	409	412	481
	438	428	
	439	434	
	460	443	
	461	447	
	478	490	
		495	
	500	521	514
	505	525	548
	512	539	594
	535	546	
	536	550	
	537	555	
	540	565	
	541	595	
	597		

Taper Down for Peak Performance

by Derek Parker (Level 4 Coach)

BMC News readers may be interested in the training and racing programme devised by veteran Irish 800 metres runner Joe Gough and me for the 2003 indoor and outdoor track season.

The schedule culminated in Joe winning the silver medal in the over 50 age group at the world outdoor championship in Puerto Rico and gold meals at the European, British, Irish and Scottish championships, all over 800 metres, indoor.

I attribute Joe's success to dedication, commitment, hard work and self-belief. I am privileged to work with him and we have learned much from each other.

Because Joe lives in County Kilkenny in the south of Ireland while my home is in south-west Scotland, all training sessions are planned and evaluated by telephone.

Double periodisation is used because Joe competes indoors during January and February as well as at national outdoor championships in June and July.

This means he attains two major peaks in a single year so an essential aspect of the programme is knowing when to increase and when to decrease workloads to consolidate training gains and avoid breakdown.

A 20 week build up to competition starts with weekly hill, fartlek, track, cross-country and circuit sessions.

A typical week for the first eight weeks is: Monday - Fartlek e.g. 8 x 45 secs at 3k pace with 90 secs recovery jog; Tuesday - 20 minutes recovery run, plus circuits e.g. press ups, sit ups, squat thrusts x 30 secs x 2 sets per exercise with 2 minutes rest between sets; Wednesday - 30 to 40 minutes steady run; Thursday - Track e.g. 6 x 400 metres at 1500 metres pace with 60 to 90 secs recovery + 3 x 30 metres full effort from flying start; Friday - Rest; Saturday - Hills e.g. 10 x 200 metres with jog back recovery; Sunday - 45 minute cross country run.

During the next six weeks, Joe trains regularly at 800 metres pace, e.g. 4 x 400 metres with 3 to 4 minutes rest. These sessions take place on Thursday s with 1500 metres sessions moved to Tuesday s. Fartlek is dropped while 400 metres pace sessions are introduced, e.g. 300 metres + 100 metres x 2 sets (45 secs between repetitions / 15 to 20 mins between sets).

The next four weeks emphasise race pace repetitions as relaxed and economically as possible. Ease of effort, as much as speed, is the goal.

The most crucial phase is the two week taper to major races. This means decreasing the workload, while emphasising sharpness and quality. A typical taper is:

Sunday: 1500 metres session, e.g. 2 x 5 x 300 metres (30 seconds between reps / 8 mins between sets)

Monday: 30 minutes recovery run

Tuesday: 800 metres session, e.g. 300 metres + 300 metres + 200 metres x 2 sets (45 secs between reps / 8 mins between sets) + 3 x 30 metres sprint from flying start

Wednesday: 30 minutes recovery run

Thursday: 400 metres session, e.g. 2 x 2 x 200 metres (45 secs between reps / 15 minutes between sets)

Friday: Rest

Saturday: Sub-400 metres pace session, e.g. 8 x 150 metres at 95% effort (250 metres walk recovery)

Sunday: 30 minutes recovery run

Monday: 20 minutes easy running

Tuesday: Split 800 and 400 metres pace session, e.g. 4 x 200 metres at 800 metres pace (30 secs between reps / 8 minutes after final 200) then 2 x 200 metres at 400 metres pace (45 secs recovery between reps / 8 minutes recovery) the 3 x 30 metres from flying start

Wednesday: 20 minutes easy run

Thursday: 3 x 150 metres fast stride (walk 250 metres recovery)

Friday: Rest

Saturday: Warm up session

Sunday: THE RACE

Budapest, 7.3.04. Women's 3km. final, left to right; MESERET DEFAR (Ethiopia, 595), BERHANE ADERE (Ethiopia), JO PAVEY (Gt. Britain, 623) and MARTA DOMINGUEZ (Spain, 579). photo by Mark Shearman.

News

Recent research suggests that fish-oil supplements containing Omega-3 acids will allow athletes to experience less breathlessness, chest tightness and other asthmas-like symptoms after exercise.

Other research suggests that the deterioration of performance from running in polluted or ozone heavy air may be countered by ingesting Vitamin C and Vitamin E. Tony Bosworth of Friends of the Earth tells me that often rural areas have high ozone levels so that being in the country is no guarantee of freedom from them. As a general rule of thumb they are highest mid-morning and mid to late afternoon/early evening. These levels vary hour to hour day to day and can be checked on www.airquality.co.uk

American research offers a warning that serious weight training may be harmful for those with an enlarged aorta as the training raises blood pressure and may give rise to an aortic dissection which is a potentially fatal tearing of the heart's main artery. The advice is that one should not attempt to lift more than 50% of ones body weight.

Quotes

"In Commonwealth countries they refer to the U.K. as 'The Land of Dope and Glory'"
Frank Horwill

"I always remember my first meeting with Frank Horwill. I was 15 years old and had been invited to an 800 meters race at Copthall Stadium. He called us together and said 'The BMC hasn't paid your fares here to F**k about.' As we came down to complete the first lap, it was obviously not fast enough for Frank, who stepped out onto the track and yelled, 'If you can't do better than this, STEP OFF THE TRACK!' We ran the next lap in 56 seconds!"
Sebastian Coe

"You may not remember me. I attended your course at Ogmore. Following that course I had my best cross-country season ever, winning the Country and Midlands title. The course taught me how to train properly and how to eat correctly. Thank you"
Midlands under 17 female

"I thought I had missed the boat. Then, I got an invite to run in a BMC mile at West London Stadium which I won in good time. This got me into Commonwealth Games Trials. The rest is history"
Brendan Foster

"I first broke 4 minutes for the mile in an obscure BMC race called the Brigg Mile at Haringey track. I think I was 19 at the time"
Steve Ovett

"I think weight training injures more people than it does good"
George Gandy, 1968

"Coe's undoubted 'kick' at the end of races is entirely due to his fantastic weight training schedule"
George Gandy, 1979

Book Review - The Perfect Mile

This timely volume, written by Neal Bascombe, relates the three or so eventful years leading up to 1954 when sub-4 was born. It portrays a 'three-cornered' advance toward that target. The combatants were, as far as this book is concerned, Wes Santee of the USA, John Landy of Australia and Roger Bannister of Britain.

Their stories are told after much research and the list of interviewees makes the reader's mouth water. However it needs to be said that the stories are presented with a sense of melodrama and the thought might be added that some are if not highly coloured then, to use an expression of recent times, 'sexed-up'. Nevertheless the whole is mightily entertaining and if one did not know the eventual 'culprit' one is carried along as in an Agatha Christie mystery. The reader is fed, page by page, year by year, toward 1954. The climax being the Commonwealth Games One Mile in Vancouver, hence the title.

Inevitably there are one or two oddities. The European Championships referred to as the European Games, a 200 yard lap time is given as 47.4, a reference made to Bannister clutching Lueg's vest at the conclusion of the 1952 Olympic 1500. My recollection, which may be faulty and I apologise if it is, was that he clutched the rear of Bob McMillens shorts. The author mentions that Landy held the world record for two days short of four years whereas it was from 21/6/54 until Derek Ibbotson'e effort on 19/7/57. These minor errors do not in any way detract from the whole although I was surprised that Bannister's third place in the European 800 of 1950 did not merit a mention as this, arguably, was the performance that brought him to world attention.

Overall each of the three contestants has been 'microscoped', few stones left unturned in an effort to present a 'dynamic' story. At a time when the media was newspaper and radio based the chase was manna to journalists the world over. If one wants an in depth analysis of a relatively short period in the history of the one mile record then this is it, but you need to allow, to some degree, for a novelists licence and flavour, but if this serves to make the tale more interesting so what!

The book is published by Collins Willow / Harper Collins at £16.99. From Harper Collins at Westerhill Road, Bishopsbriggs, Glasgow G64 2QT.

As a special offer to BMC members, up to 31st July, 2004, the price is £13.99. Post free in the UK. Cheques should be made payable to Harper Collins Publishers. Phone 0870 787 1724 quote 44Y.

Cold Comfort

British middle distance fans will be all too aware of slip in standards since the 'Golden" years of Coe, Ovett, Cram and Elliott. Take heart, we are not alone, far from it.

In the years after WW2 Sweden had world ranked athletes as follows:

	800	1500
1946	7 in top 20	8 in top 10
1947	5 in top 20	6 in top 10
1948	5 in top 20	5 in top 10
1949	5 in top 20	5 in top 10
1950	4 in top 20	4 in top 10

By the end of 1957 Sweden still had two 1500 men in the all-time top 15. But by 2002 could not place one man in the top 100! The 800 was better with their best man placed at 88th. So, please, spare a thought for the (elder) Swedish M/D track fan.

The case of Germany, albeit a later period, with more competition around the world they have slid.

	800	1500
1974	2 in top 20	0 in top 20
1975	1 in top 20	3 in top 20
1976	1 in top 20	2 in top 20
1977	2 in top 20	5 in top 20

All time at end of 1977

800	18, 19 and 28
1500	9, 14, 17 and 18

All time at end of 2002

800	49
1500	46

2002 ranked

800	12, 42, 147 and 172
1500	48, 72, 116 and 145

Of course the advent of prolific numbers from Africa have made it difficult for Europeans but that does not make the pill any easier to swallow.

When observing these trends in the UK some observers suggest that this 'recession' is cyclical. Surely this is not an evidence based comment. There is no reason why UK standards should ever rise again by themselves. They will only do so if athletes, coaches and the authorities MAKE IT HAPPEN!!

There is cold comfort in the current lack of success of Sweden and Germany (their stats for 2003 show some improvement). We should only be concerned with our, UK, standards. This magazine continues to carry coaching articles, expertise and advice of the highest level. We must hope that it is being used.

How Much Do You Know About Running?
- ANSWERS -

1. Dave Bedford ran 27:30.8 on the 13th July, 1973.
2. Dave Moorcroft ran 13:00.4 on the 7th July, 1982.
3. Yobes Ondieki ran 26:58.3 on the 10th July, 1993.
4. Kelly Holmes hold U.K. records for 800, 1,000 and 1,500 metres.
5. Steve Jones ran 2:07:13 on the 20th October, 1985.
6. Five days, on the 6th day endurance will have declined 1% and will decline rapidly, i.e. 7th day - 2%, 8th day - 4%, 9th day - 8%, etc.
7. In the morning because this will elevate the metabolic rate for several hours afterwards which means more calories will be burnt even while resting.
8. Males are allocated 214 less 0.8 for every year of age. Females are allocated 209 less 0.7 for every year of age.
9. How far can you run in 15 minutes is the main point. Then, how far can you run in the same time 12 weeks later.
10. The speed of running which causes lactate to accumulate rapidly. For some it's 8mph and others 13mph.
11. It used to be for 39 minutes until cases of permanent muscle paralysis were found after such application. Now it's 5 minutes, 5 minutes break and reapply.
12. The quadriceps (thigh) are the main supporters of the knee.
13. The abdominals are the main supporters of the lower spine.
14. Apply ice for 5 minutes, then, hot as bearable water for 2 minutes repeated, every 4 hours, forty eight hours after the initial injury.
15. Zinc deficiency.
16. A full out 400 metres run.
17. Breathing in the same amount of oxygen required for the speed of running is aerobic, inability to do this is anaerobic. Jogging 100% aerobic; 200m sprint 95% anaerobic.
18. Sprint a distance, relax a distance, sprint a distance, e.g. Sprint 100 metres, relax 100 metres by lowering arms, sprint 100 metres.
19. Instead of doing just 8 x 400 with 200 jog, the athlete walks a lap recovery and repeats the session instead of doing 16 x 400 with 200 jog straight off. This makes for greater speed in the reps. It can also be used to increase the volume of training.
20. One lap of the track is run at marathon pace (90 secs), without stopping the next lap is run at 5k pace (78 secs), this continues non stop until the pace drops off. A lap walk recovery is taken and the session continues until 10k total (25 laps) is done on time, several breaks may be necessary to get through this with first attempts. Note that marathon pace may be 100 secs/400m and 5k pace 88 secs/400m.

HOW DID YOU GET ON?

If you scored over 15,
you are a great reader.

Scores of 10-15
denote above average interest.

Scores below 10
mean you are too busy training to do much reading about it!

Compiled by Frank Horwill, 4 Capstan House, Glengarnock Avenue, London EL4 3DF. Tel: (020) 7515 3472.

Rankings

The IAAF have devised a ranking system based upon two main elements, the measured results and the placings during competition. The rankings are based upon ranking scores as under:-

Ranking scores = average of performance scores

Performance score = result score + placing score

Essentially performances in high class competition rate high.Effectively a 3:34 in a low class meet e.g club meet will score much lower than the same time in an Olympic final. (Hope this makes sense)

GB results in 2003...in world top 100

Men 800/1000	*1500*
26 James McIlroy	25 Tony Whiteman
42 Ricky Soos	28 Michael East
69 Neil Speaight	43 Tom Mayo
91 Chris Moss	51 John Mayock
	62 Chris Mulvaney
	66 James Thie
	91 Michael Skinner
	97 James Bowler

World wise Kenya has 17 in the top 800, USA 12, Germany and South Africa 5 each, with Spain and Russia the same as GB.

At 1500 Kenya again leads with 17, Spain has 11 as has the USA , GB has 8, one ahead of France.

Women 800/1000	*1500*
3 Kelly Holmes	4 Hayley Tullett
20 Joanne Fenn	11 Joanne Pavey
46 Susan Scott	57 Hayley Ovens
65 Charlotte Moore	69 Kelly Gilibrand
69 Rebecca Lyne	82 Lisa Dobriskey
92 Lucy Vaughan	90 Natalie Lewis

Internationally at 800. Russia has 16 in the top 100, USA 8, GB 6, NB Spain and Germany 3 each and France 1. At 1500 Russia has 15 in the top 100 whilst the USA has 14, GB and Spain 6 each with France at 4 and Germany with 1.

The Ancient Art of Mile Pacemaking
Dating From 1852!

By Bob Phillips

For those who imagine that pace-making in middle-distance races is a modern phenomenon, it may come as a surprise to learn that the first British mile records – and, for that matter, World mile records – were broken in just such a manner more than 150 years ago. To be absolutely accurate, there was no concept of British or World records in athletics in the 1850s, and the first such official compilation would not be made for another 30 years or so, but there was no doubting the validity of the performances.

During the 1850s and early 1860s Manchester had become the miling capital of Britain, and as there was very little organised competition taking place in any other country in the World that meant that whoever won any of the series of "Champion Cup" races held in the city during this era could describe himself as "World No.1". These men were professional runners, known as "peds" (an abbreviation of "pedestrians"), who raced for prizes of £50 to £100 which would compare very favourably with what is on offer to many Grand Prix winners in the 21st Century. Their races were largely two-man challenge matches and were attended by crowds of tens of thousands whose primary interest was in the massive amount of betting which accompanied the events.

Manchester was increasing its population at an enormous rate, largely based on the expansion of its cotton industry as one of the cornerstones of the Industrial Revolution, but still had the space to build tracks. It thus became a major centre for athletics competition, while many of the London tracks were swallowed up by even more rapid development. Such facilities in the Manchester area were usually financed by enterprising publicans on their adjoining land and cinder running circuits of as much as half-a-mile in circumference would be built, according to whatever ground was available.

Mile races had been run at least since the 18th Century, and there are accounts of winning times of "four minutes", or even on one occasion "3 minutes 58 seconds", on public highways. Neither the distances covered nor the methods of timing can ever be verified, and so the first authenticated mile "record" on a custom-made circuit, and with accurate timing to the nearest one-fifth or one-quarter of a second, is credited to a Londoner, Charley Westhall, who had given up his medical studies to make a living as a "ped" and achieved 4min 28sec on a gravel track at Islington, in London, in 1852. In torrential rain Westhall beat two of the other leading runners of his generation, Billy Jackson and the American-born George Seward, who had each been given a handicap start of 10 yards. Jackson was more at home at longer distances, having set records of 14:52.0 for three miles and 30:04.0 for six miles in the same race in 1852, while Seward was essentially a sprinter who had run 100 yards in the prized "even time" of 10.0sec. In effect, they were the pace-setters, and the arrangement worked because Westhall's eventual winning margin was described as "at least 10 yards".

Solihull, 6.8.03. LOUISE DAMEN. photo by Mark Shearman.

From 1857 to 1865 the "record" time was equalled or improved on seven occasions – all of them in Manchester. Tommy Horspool, who was Lancastrian-born but lived at Basford, near Nottingham, and was a glove-knitter by trade, also ran 4:28 in 1857 and then 4:23 the following year at the Copenhagen Grounds, at Newton Heath, some three miles from the centre of Manchester, where there was a cinder track measuring just over two-thirds of a mile. This was truly a pioneering athletics "stadium" venture by the proprietor, Tommy Hayes, who had himself been a fine distance-runner, because the track was flat and well-drained, with wooden railings and even grandstand accommodation for 1,000 spectators. On this latter occasion Horspool, who had first been declared mile champion in 1853, had beaten Job Smith by 10 yards and then retired undefeated to invest his winnings in a public house in Nottingham.

The next three mile "records" also involved two-man matches to decide Horspool's successor. Siah Albison, then aged only 20, beat Bill Lang, also 20, by the narrowest of margins with a time of 4:22 at the Copenhagen Grounds in 1860, and then Lang ran 4:21 at another Manchester venue, the City Grounds, in 1863, winning on the 800-yard cinder track by some 10 yards from James Sanderson. All of these runners had strong Mancunian connections: Albison came from the nearby village of Bow Lee; Lang was born in Stockton-on-Tees but made his home in Manchester; Sanderson came from the neighbouring Lancashire cotton town of Rochdale.

During the next year Teddy Mills – born in the East End of London and loftily known as "Young England" to his supporters – achieved 4:20? at the Royal Oak grounds, beating an Irishman, Patrick Stapleton, on a 651-yeard cinder track. Even Mills's quarter-mile "splits" have survived and we know that he ran 60.0, 2:08 and 3:16 en route. This was a classic example of the way in which milers distributed their effort

in those days, with a fast start, a substantial easing-off in the middle laps, and then as much of a pace as could be mustered towards the finish. It was commonplace for an athlete to abandon the race once he realised he was beaten, and Stapleton did so 30 yards from the end. Thus it may be that Mills could have been the first man to beat 4:20, had he been pressed all the way.

Rivalry between promoters at these various Manchester venues was intense, and George Martin was enterprising enough to bring together all of the great milers of the 1860s at his Royal Oak Grounds on 19 August 1865. The race was again for a "Champion Cup", signifying the leading miler in England, and it could as easily have been described as the "Mile of the Century". The eight invited runners were Siah Albison, Bill Lang, Teddy Mills, Robert McKinstray, James Nuttall, William Richards, James Sanderson and Patrick Stapleton. and this was an historic first occasion on which such a numerous collection of "stars" had raced en masse.

Albison, Lang and Mills had each in turn won mile match races in record-breaking times, while Sanderson and Stapleton also had strong reputations at the distance. McKinstray was a Scotsman who the previous May at the same track had run what was regarded as a sensational 880 yards time of 1:56, with the Welshman, Richards, only five yards behind. Yet the most intriguing invitee was Nuttall, who originated from nearby Stockport and was primarily a quarter-miler with a best time of 51sec in 1859 which remained the British "record". The curiosity of the feverishly excited crowd as to Nuttall's role in the proceedings was soon satisfied when he rushed into the lead and sped through the first two laps in a breakneck 60.0 and 2:05. The pace then eased in the third quarter as Lang led in 3:14, with the others in close attendance.

The finish was intensely exciting as Richards came up alongside Lang and both crossed the line together. They could neither be separated in position nor in time by the officials and were both credited with 4:17?. McKinstray was close behind in an estimated 4:18. Sanderson was 4th, at some 30 yards. Stapleton was 5th and Albison 6th. Nuttall failed to finish, which strengthens the impression that he was only ever there to act as a pacemaker. The winning time was not beaten until the Scottish professional, Will Cummings, ran 4:16 1/5 16 years later in 1881. Lang had also set a two miles record of 9:11? at the City Grounds in 1863, while Richards was to run a -mile in 3:07 on the Royal Oak track in 1866. They can both be truly regarded as among the great runners of the 19th Century, and it was only when Walter George achieved an historic 4:12? in 1886 that their mile times were significantly eclipsed.

After the 1860s professional athletics fell into disrepute as a result of alleged race fixing and rioting by crowds believing they had been cheated out of their bets, and the gentlemen amateurs became dominant with the start of the series of Oxford-v-Cambridge Inter-Varsity matches in 1864 and a short-lived sequence of "Olympic Festivals" in Liverpool from 1863 to 1866. The first "national" championships were held 10 years later and the Amateur Athletic Association was formed in 1880 to co-ordinate administration of the sport – and, incidentally, to ensure that its control remained in London, rather than being established in Liverpool or Manchester. Standards among Britain's amateur milers took a long time to match the "peds" and it was not until the 1895 AAA Championships that an amateur, Fred Bacon (who turned professional shortly afterwards), beat the time of Lang and Richards, and not until 1915 that another amateur – Norman Taber, of the USA – ran faster than Walter George.

What the professionals and amateurs *did* share in common was a training regime which would seem derisory by today's standards. Victorian-age athletes were firm believers in restraint. It was generally accepted that hard training was at best foolhardy and could even prove fatal. The most dedicated of runners would rarely exceed -mile in training at any sort of reasonable pace, and even that no more than once or twice a week. Montague Shearman – the foremost athletics historian of the 19th Century who was himself a leading athlete – declared forebodingly in a book which he wrote in 1889: "If the runner takes a long spin or a very fast spin one day, and finds upon turning out the next day that he feels slack from the previous day's exercise, he will do well to take an easier day's work". In Shearman's reckoning, "a long spin" meant anything more than half-a-mile. The professionals of the 1850s and 1860s *might* have trained somewhat harder, but they had a tendency to start their preparations only when a match had been arranged, and as their managers tended to be proprietors of public-houses, and their protégé's training was done on or near the premises, much initial effort was expended in shedding excess weight. It was probably not until the advent of Walter George, who claimed with good reason to have run a mile in under 4:10 and 10 miles in 49:49 in training, that the idea of extending oneself began to take hold.

George set his 4:12 in a match race with Will Cummings in which he had no hesitation in taking the lead from the start and haring through the 440 in 58? and the half-mile in 2:02 to take the sting out of his opponent. He then fought off a spirited challenge after passing the bell in 3:07? to leave Cummings collapsed by the trackside. Later mile records, including some of those which were officially ratified after the International Amateur Athletic Federation (as it was originally called) was set up in 1912, were to benefit from circumstances which were decidedly much more artificial. For example, when the Irish-born American, Tommy Conneff, set an amateur record of 4:15 3/5 in New York in 1893 he had a Canadian, George Orton, to lead him through the first half-mile, and then an English-born miler of considerable competence, Eddie Carter, to take the last 300 yards. For Norman Taber's 4:12.6 of 1915 three other runners received starts of 10 yards, 120 yards and 355 yards to help him through.

The first sub-4:10 mile, achieved by the Frenchman, Jules Ladoumègue, in 1931, had the benefit of a first half-mile run efficiently to orders by 19-year-old René Morel in 2:04.2, but the planning for the record-breaking bid by Britain's Sydney Wooderson at the famed Motspur Park track in Surrey in 1937 was far more sophisticated. Wooderson was the only man in the 14-strong field to start from "scratch", and the handicapping was carefully arranged, with a former British Empire mile champion, Reg Thomas, off 10 yards; another British international miler, Bernard Eeles, off 65 yards; Jack Powell, an outstanding 800 metres runner, off 100 yards; and Sydney's brother, Stanley, off 140 yards. Thomas led the first

two laps in 2:02.6 and Powell was ahead at the bell in 3:07.2, with Wooderson on his shoulder and then going away to pass all but one of the handicap men and finish in 4:06.4.

All of these machinations were happily tolerated over the years by officialdom, even including the staid administrators of the AAA, and there was no hesitation in ratifying Wooderson's time, but by the early 1950s views were changing. One "race", more than any other, was responsible for this change of heart. On 27 June 1953, during the lunch interval of the Surrey Schools' Championships at Motspur Park, Roger Bannister ran a mile in 4:02.0, which served to bring much more sharply into focus the prospect of his breaking four minutes, but it was the manner in which this was achieved which caused widespread controversy. There had been only two other starters in the event, and the Australian, Don Macmillan, had led through halfway in 1:59.7 and Chris Brasher had been in front when Bannister reached the bell in 3:01.8 – though in order to be on hand to provide the necessary assistance Brasher had trotted leisurely round two laps and waited for Bannister to catch him. Many of the less attentive youthful spectators thought Brasher was still winning on the last lap.

The media were incensed not so much at the style of the operation as the unannounced manner of it. Even the correspondent of "The Times" was icily dismissive, referring to "the profound secrecy with which this project was carried out" which had "prevented all but a favoured few from being able to give an eye-witness account". Had Bannister beaten the then World record of 4:01.4, held by the Swede, Gunder Hägg, since 1945, or had he – heaven forbid ! – broken through the legendary four-minute barrier, one can only guess at what the outcry among the absent pressmen would have been!

The next year, as we now know, Bannister *did* break four minutes, with his close friends, Brasher and Chris Chataway, to help him, and a year after that the British Amateur Athletic Board, which was then responsible for the wider aspects of the sport, decided to put a stop to what were considered to be "organised" record-breaking attempts and stated that future applications for records would be viewed in the context of "whether the claimant was unfairly assisted towards the time accomplished by pacing from another competitor apparently designed to assist him to achieve the record". In this day and age of the 21st Century, when not a Grand Prix meeting passes by without one or more record attempts being widely advertised beforehand, and the names of the designated pace-makers being made widely known, it all seems very quaint that such a ruling should have been made, and even at the time of its introduction there was a storm of protest from athletes and coaches to the effect that foreign athletes would be at an advantage and that British runners would have to go abroad to seek fast races.

Bannister's historic first sub-four-minute mile would not have been accepted according to this new legislation, but when it was put to the test it became immediately obvious that the rule was unworkable. At the White City Stadium in July 1957 Derek Ibbotson – previously better known as a distance-runner – somewhat surprisingly beat the World record 3:57.9 of the Australian, John Landy, by seven-tenths of a second. Mike Blagrove, an international miler who later had the distinction of becoming the first man to run a mile in precisely four minutes, had led through the opening half-mile in 1:55.8, which was clearly of inestimable value to Ibbotson, but who could say whether it was only Ibbotson that benefited? There were others in the race, including the Olympic 1500 metres champion, Ron Delany, of Ireland, and the World record-holder at that distance, Stanislav Jungwirth, of Czechoslovakia, who were perfectly capable of winning and could be said to have been aided. One veteran British official at the meeting refused to sign the record application, but it was submitted nevertheless to the IAAF and duly passed.

Pacemaking, 105 years after it was first devised, had become part and parcel of middle-distance running.

Bob Phillips was a member of the BBC Radio athletics commentary team from 1985 to 2001 and has since written five books on athletics, including a biography of Emil Zátopek and a history of the Commonwealth Games. His latest work is "3:59.4: The Quest For The Four Minute Mile", marking the 50th anniversary of Roger Bannister's achievement and tracing the history of the mile from Ancient Greek times to the present day. The book is published by The Parrswood Press, in Manchester (website, www.parrswoodpress.com; e-mail, sport@parrswoodpress.com; telephone, 0161-226-4466).

Budapest, 6.3.04. MICHAEL EAST. photo by Mark Shearman.

Solihull, 6.8.03. I. to r. MICHAEL EAST (4), DERRICK PETERSON (USA. 1), JOEL KIDGER (7) and DANIEL CAULFIELD (Ireland, 5) lead the chase after ISMAIL MOHAMED (Sudan) in the 'A' 800m. photograph by Mark Shearman.

Wythenshawe, 31.5.03. JEMMA SIMPSON. photo by Mark Shearman.

Solihull, 6.8.03. TOM SNOW (221) leads from GARY DAVENPORT (208) in the 'C' 1500m. photograph by Mark Shearman.

Watford, 5.7.03. TINA BROWN leads. photo by Mark Shearman.

BACK COVER PHOTOGRAPHS

Top: Sheffield, 7.2.04
MIKE EAST (78), leads from TOM MAYO (163) and MATT SHONE (223)

Bottom: Wythenshawe, 31.5.03
JENNY MEADOWS leads from KELLY McNEICE (Ireland)

By Mark Shearman

Ask ...

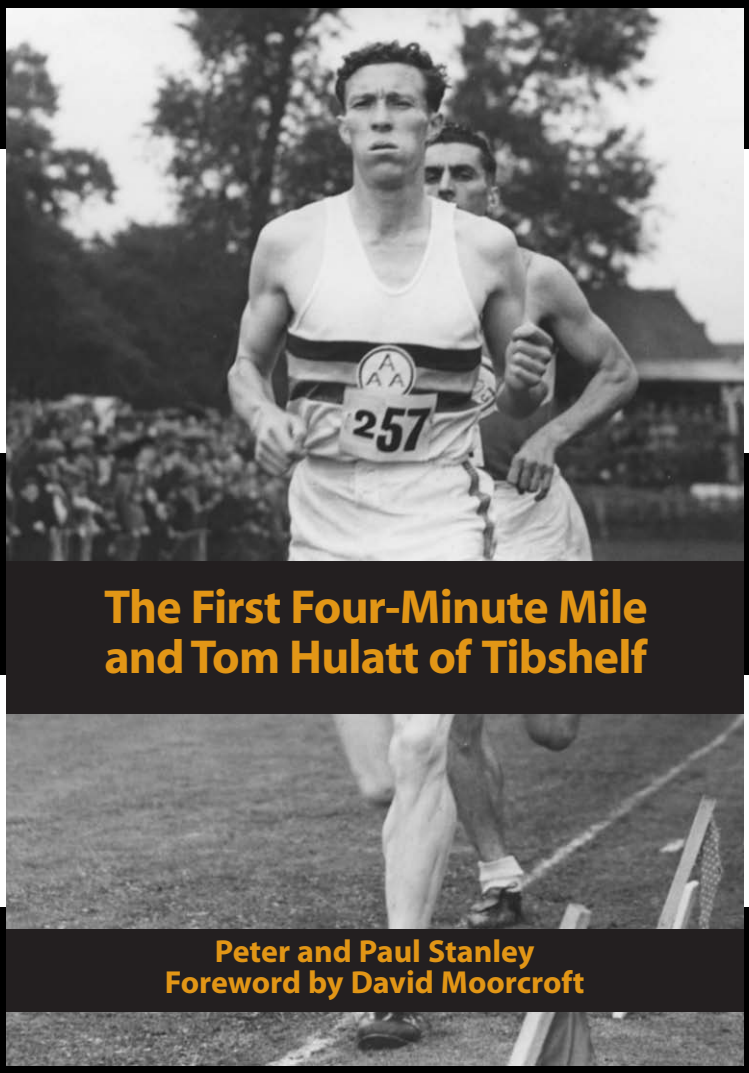
"who won the first sub-four-minute mile at Iffley Road, Oxford in 1954?" and the reply will be "Roger Bannister".

Ask ...

"who came second?" and a good number will reply "Chris Chataway".

Ask ...

"who came third?" and it is a safe bet nobody will know.



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