

BMC



NEWS

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The British Milers' Club

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Founded 1963

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- Roger Williams, 53 The Greenway, Uxbridge UE8 2PL.

COVER PHOTOGRAPHS

Top: Cardiff, 4.7.01.
CHRIS THOMPSON leads from
JON WILD.

Bottom: Watford, 9.6.01.
KERRY SMITHSON (360) wins
1500m from FRIEDA DAVOREN
(354).

By Mark Shearman

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MERTHYR MAWR TRAINING WEEK-END

OCTOBER 11th-13th – for over 13's up to under 23's

Males and Females

Applications to:

Frank Horwill, 4 Capstan House, Glengarnock Avenue,
London E14 3DF

GRAND PRIX PRIZES

A new prize structure is to be introduced for the 2002 Nike Grand Prix Series, which will increase the amount that athletes can win in the 800m and 1500m races if they run particular target times. The new structure aims to encourage athletes to go for fast times to help attract additional interest from good quality and overseas athletes.

THE GRAND PRIX PRIZES WILL BE AS FOLLOWS

	First	Second	Third	Fourth
'Normal Time'	£75.00	£50.00	£30.00	£20.00
Elite Time	£150.00	£100.00	£60.00	£40.00
European Championships Qualifying Time	£300.00	£200.00	£120.00	£80.00
BMC Record	£750.00	N/A	N/A	N/A

The above amounts are 'total winnings' so for instance a male 800m runner who wins in 1:49.1 would take home £75, if he ran 1:49.0 (the elite standard) he would take home £150.

A 'Normal Time' is a slower time than the elite standard.

The BMC Record will be the time as at the day of the race and is the best time by anyone in a BMC race.

ADDITIONAL PRIZES

In addition to these prizes £400 will be paid for a performance by a non-winning athlete who runs a BMC Members record. This is the best performance by a paid up BMC member in a BMC race. This could be achieved by a second or third placed athlete who runs a members record in a race won by a non-member.

A £100 prize will be paid for a BMC Junior members record. This is the best performance by a paid up Junior BMC member in a BMC race.

Non-members who have not been especially invited as guests will have their joining subscription deducted from any winnings.

If an athlete has more than one performance in the same event on the same night then their best performance only counts for the prize money.

THE TIMES ARE:-

	M 800m	W 800m	M 1500m	W 1500m
Elite Time	1:49.0	2:05.0	3:43.0	4:20.0
European Championships Qualifying Time	1:46.5	2:00.5	3:36.5	4:06.0
BMC Record*	1:45.2	2:00.7	3:37.5	4:06.39
BMC Members Record*	1:46.7	2:01.93	3:37.5	4:06.39
BMC Members Record*	1:47.69	2:05.96	3:42.2	4:20.0

*Records as at 17.4.02



Chairmans' Notes

As we are embarking on the 2002 season it is very pleasing to see that both Anthony Whiteman and Matt Shone have recently posted 800m times in south Africa which are superior to that achieved by an UK athlete during 2001.

Many other notable Winter performances also indicate that the 2002 Summer season should see progress for the middle distance events. John Mayock (3000m) and Michael East (1500m) led the way with their bronze medals at the European Indoor Champs and the young Wigan athlete Jennifer Meadows has shown what a great future she should have over 800m in the coming years.

In the last Autumn issue of the BMC News I reported that for our 2002 BMC Nike GP dates we had been limited to only 2 Saturday fixtures due to the dictats of the traditional UK Track & Field Fixtures list. Only one of these was in the earlier part of the season, June 22nd at Solihull. Since this time many athletes and coaches have voiced their dissatisfaction at this situation to me. Most cannot understand how mismatched middle and longer distance races of many League/Cup matches and low level County Meetings continue to gain precedence over our own GP and UKA/London marathon Endurance initiative Series. I believe that if we are to see UK middle distance standards improve we have to move to Saturdays for all of our 5 major Summer meetings. This is a view which I proposed at the UKA Endurance fixtures Congress held at Trafford on 20th April 2002. In order to more accurately assess your views and to gain a mandate for action we will be issuing simple questionnaires on this subject at the forthcoming GP Series. If we are to progress to Saturdays for these competitions during



Dr. Norman Poole, Chairman

2003 any clashes with League and Cup fixtures can be avoided by a more considerate selection of dates by the Track & field League Fixtures Secretaries.

In the Autumn issue of the BMC News I also touched on the subject of Initiatives to further enhance the standard of our BMC Nike GO Series A races and the UKA?LMEI Series. I am pleased to report that UKA are contacting most of the European Track & Field Federations to invite a limited number of athletes of the appropriate standard for all of the events from 800m-5000m and s/c. UKA will oversee the not inconsiderable task of administering and funding the UK element of the transport/accommodation of these athletes.

Concerning the debate of paced/non paced BMC races, the view now is that we will continue to focus and deliver on paced competitions and rely on Championships to provide the 'racing' environment for our athletes. Although we are all concerned in raising the ability of our athletes to race, most

have indicated that there would be little enthusiasm, i.e. the entries would greatly reduce, if we removed the pacing element from our competitions. The statisticians on our Committee have noted that although we initiate paced races, as many as 30% of our top competitions do develop into tactical affairs. Perhaps we offer more 'racing' situations than we are given credit for.

In term of racing the 2002 Summer season definitely offers much to the middle distance athlete. The AAA does appreciate that a major aim of many English athletes is to compete in the Commonwealth Games Trials to be held in Manchester on 15/16th June. In order to encourage the events and the numbers compete in these Trials the AAA have posted relatively moderate entry standards and the qualifying dates will remain open close to the Trials date. I am sure that this and other initiatives will help to raise the in-depth standards of our events during the 2002 as season.

Book Reviews

Za-to-pek! Za-to-pek! Za-to-pek!

With the recent demise of, arguably, the world's greatest distance runner this book, by Bob Phillips, tells of Zatopek's life and times. A more useful volume would be difficult to envisage, it traces his life, through all its changes and problems. On the stats side there are several pages showing his races from 1941 through to 1958. He does not appear to have raced over 800 after 1945 and his excursions over 1500 were few. The book is worth having for the stats alone.

Published by The Parrs Wood Press at £14.95, post paid, from them at Freepost, Manchester, M15 9PW.

1500m/1 Mile

This latest in a series by the NUTS contains a monumental amount of data. For anybody with an interest in these events it must be indispensable. It would need more space than here available to do it justice. There are mini-biographies of notable athletes over the last 150 years. There are major championships results and career details of those who bettered 3:42 and 4 minutes. Peter Matthews and his aides deserve the highest congratulations for their efforts. The data is up to the end of 2001 and many BMC members will find their performances recorded, note that the best performance list goes down to 4:04.5 in the mile so our worthy Chairman gets mentioned! and at £5.00, which includes postage, it is very inexpensive.

Obtainable from Dave Terry, 34, Windmill Hill, Ruislip, Middx., HA4 8PX.

NB: Subs of £15.00 for 2002 were due Jan 1st and should be sent to Pat Fitzgerald payable to BMC.

What do you think?

At a recent meeting, members of your committee submitted the following questions for your consideration. It is hoped that members will respond in order that a balance of opinion may be considered.

Do you think that more of the BMC Nike GP meetings should be held on Saturday evenings rather than mid-week?

If you think yes how many of the five dates should be Saturdays?

In order to increase our Saturday GP dates we may have to clash with British League dates. Would you support the BMC if such a clash occurs?

Would you support the establishment of a BMC short-course CC championship in the autumn?

Would there be interest/support for a short-course CC GP on the same lines as the Reebok Challenge?

Should the BMC regions perhaps concentrate more on putting on Young Athletes races?

Would you like to see more BMC training weekends for both juniors and seniors?

How can the BMC improve the paced races OR how many athletes should be allowed to run in paced 1500 and 800 races to optimise



The 800 Metres Analysed

Let us imagine that we have three females with a best time of 60-seconds for 400 metres. All have raced 800 metres 20 times and their best times to date are:

Athlete "A" 2mins 16secs.
Athlete "B" 2mins 12secs.
Athlete "C" 2mins 08secs.

What conclusions can we draw from these times?

Athlete "A" can only manage two consecutive laps 8 seconds per 400m, slower than her best for 400m, ie. $60 + 8\text{secs} = 68\text{secs} \times 2 = 2:16$. Athlete "B" does a little better, two laps together 6 \bar{n} secs per 400 metres slower than in her best 400 metres. But, athlete "C" has a formula of $60 + 4\text{secs} = 64\text{secs} \times 2 = 2:08$. In fact, "C" has, what many consider to be, reached the maximum possible 800 metres time with her current best 400 metres recording. Coe had a conversion time of 3:9 secs.

We can say that "A" lacks endurance and probably never races 1500 metres, nor trains at that pace. Athlete "B" has fair endurance, possibly races 1500 metres and trains occasionally at 1500 metres speed. Athlete "C" has excellent endurance, and probably has a 1500 metres time of 4 mins. 18secs, which will certainly involve training at that pace. How are

they all going to improve? Both athletes "A" & "B" need to train regularly at 1500 metres speed and race the distance frequently. What sessions come to mind? Some work in excess of 800 metres in reps., possibly This could be 1 x 1k from 3 mins. 20 secs to 2 mins. 52 secs with 4 mins rest, then 1 x 800 from 2 mins.40 secs to 2 mins.18 secs, 3 mins rest, 1 x 600 from 2 mins to 1 min. 43 secs, 2 mins rest, 1 x 400 from 80 secs to 69 secs. A total of 2,800 metres at 1500 metres speed. Another good session is 4 x 800 in sets of 2 x 800 with 90 secs rest, and 5 mins walk after the first set.

What about athlete "C"? Her endurance has reached maximum. She has to maintain this and bring her 400 metres time down to 56-seconds if she wishes to progress. Note that if she reaches this time and maintains her endurance, she can run $56\text{secs} + 4\text{secs} = 60\text{secs} \times 2 = 2\text{mins}/800\text{metres}$. She might even become an international. But, reducing one's 400 metres time requires study and application. A V Hill noted that the distance was run 83% anaerobically and Messrs Fox and Matthews described it as being 80% ATP-PC-LA, 15% LA-02 and 5% O2.

While sprinting flat out 200 metre reps in 95% anaerobic, the real work in a 400 metres race starts from 200 metres on, and sprint work is 16 x 200 in sets of 4 x 200, with three times the time of the rep, as recovery after each set. Actually running the distance of 400 metres x 8 in sets of 4 x 400 with twice the time of the rep. as recover, also feeds this energy pathway, eg 400 in sub 60 secs with 120 secs rest.

There are certain strength parameters to be met for racing 400 metres. These include hopping 25 metres in 10 minus hops on each leg.

Sprinting 40 yards (36.6m) in under 5.5 secs. Hamstrings 60% as strong as quadriceps. One-legged half squats with half-bodyweight across the shoulders or in a rucksack.

Many two-lappers like to describe themselves as 400/800 runners. They can only say this if they have times of sub 46 secs (males), and sub 52 secs (females). Often this declaration is made to avoid endurance work! If a 47 secs 800 runner can only run $47 + 6 = 53 \times 2 = 1:46$, he is not a 400/800 runner, to reach world class he has to have a conversion rate of $47 + 4\text{secs} = 51\text{secs} \times 2 = 1:42$.

The two-lapper must train at three different speeds at least per week to cover all the race requirements. It should be noted that the primary energy system in the 800 metres is 65% LA-02 and in the 1500 metres 55% LA-02, not far apart. This is one reason why good 1500 metre runners who do very little 800 metres pace training, give a good account of themselves over two laps. The 800 metre specialist has basically three methods of training to choose from:-

- 1) A V Hill's recommendations
- 2) Fox and Matthews energy pathways
- 3) Logic, Hill stated the two-laps are 67% anaerobic, 33% aerobic. Given six training sessions a week, four will be anaerobic and two aerobic, and could look like this:-

- Day 1 – Anaerobic – 8 x 100m sprints, walk back recovery (WBR)
Day 2 – Anaerobic – 8 x 200m sprints, WBR
Day 3 – Anaerobic – 10 mile run of 4 x 1500m at 3k pace with 3 mins rest.
Day 4 – Anaerobic – 1 x 600 + 1 x 200, 2 mins rest after 600, lap WR After

200. 1 x 500 + 1 x 300, 90 secs rest after 500, lap WR after 300 2 x 400 60 secs rest.

- Day 5 – Anaerobic – 1 x 350, 1 x 300, 1 x 250, 1 x 200, all at max. effort with LWR
Day 6 – Aerobic – 10k fast run or 8 x 800 at 3k pace with 90 secs rest.
Day 7 – REST

Fox and Matthews regime: -

- Day 1 – La-O2 \bar{n} 4 x 800 in sets of 2 x 800 with same time as rep. for rest. Lap WR after set.
Day 2 – LA-O2 – 5 x 600 with twice the time of rep. as recovery.
Day 3 – ATP-PC-LA – 16 x 200 in sets of 4 x 200 with three times the time of rep. as recovery. Lap WR after each set.
Day 4 – LA-O2 – repeat Day 1.
Day 5 – Repeat Day 2.
Day 6 – O2 – 10 mile run or 6 x 1k with half time of rep. as recovery.

Logic schedule:-

- Day 1 – 1500m pace – 3 x 1 x 400 + 1 x 800 + 1 x 300, 45 secs rest after 400, 90 secs after 800, lap WR after sets.
Day 2 – 35 mins to 70 mins steady run.
Day 3 – 800m pace – 4 x 534 (two-thirds of 800m) with 4mins rest
Day 4 – 35 mins to 70 mins steady run.
Day 5 – 400 m pace – 4 x 350 full out with lap WR
Day 6 – Multiple pace – 1 x 1k at 1500m speed, 4 mins rest, 2x500 at 800m speed, 4 mins rest, 4 x 250 sprints with 2mins rest

N.B. Some athletes may prefer to do TWO 1500 metre pace sessions a week, and also TWO 800 metre pace workouts.

Lecture by Frank Horwill 22nd March 2002.

Predicting Your VO2 Max with 95% Accuracy

The VO2 max as a predictor of performance is not too good where slower running is concerned (Marathon, half-marathon, 10k and 5k), however, IT IS A GOOD PREDICTOR for the 800 metres and 1500 metres, more so the second. To check it, run around the track on a WINDLESS day for 15 minutes. Note the total distance run. Balke's formula has been computed by Frank Horwill as follows:-

Distance Run	Predicted VO ₂ Max.	Comments
3,000m	45.5mls.kg.min	Very poor, possibly overweight
3,400m	49.9mls	Poor, coming back from injury?
3,800m	53.8mls	Very fair. More work needed
4,200m	58.2mls	Fair. More long reps.
4,600m	62.6mls	Good for female. Work men!
4,000m	67.5mls	Excellent for female. O.K. men
5,400m	71.9mls	Good for males. Sub 14mins/5k
5,800m	76.3mls	Very good for males. Sub 13mins/5k
6,000m	79.7mls	World Class. Sub 12mins.30secs/5k

NB. many speed orientated 800 metre runners (sub 47secs/male, sub 54secs/female) can only run 5k in 15 mins (67,5mls.kg.min)male, and 4,600m (62.6mls) females.

Note that Coe had an actual VO2 max of 80mls.kig.min on a treadmill test. All the compiler's sub 4-minute milers were over 75mls.kig.min.



“I DO NOT AGREE THAT THE 1500 METRES IS 50% ANAEROBIC AND 50% AEROBIC” – TRUE?

In 1932, the noted physiologist, A V Hill, declared that the 1500 metres race required 36 litres of oxygen, of which only half could be breathed in. For this discovery and others, he was awarded the Noble Prize. In 1976, Messrs E L Fox and D K Matthews, stated that the 1500 metres was 55% LA-02, 25% O2, and 20% ATP-PC and LA. These ENERGY PATHWAYS, they stated, were DURATION REGULATED in training time. LA-02 work ranged from 90 seconds to 180 seconds (5 x 600 or 4 x 800). O2 work ranged from 180 seconds onwards, (3 x 1200 or 4 x 1600). ATP-PC and LA ranged from 30 seconds to 80 seconds (16 x 200 or 8 x 400).

The late Harry Wilson (Steve Ovett's coach)

stated that in his view the 1500 metres was 60% aerobic. He was unable to prove his point via research, it was an opinion based on experience.

The following are predominantly aerobic:-
Marathon – 99%, Half Marathon – 94%, 10k – 90% 5k – 80%, 3k – 60%.

The following are predominantly anaerobic:-
200m – 95%, 400m – 83%, 800m – 67%.

Given six one hour a day training sessions in a week, according to A V Hill, three will be aerobic and three anaerobic, and could look like this:-

Day 1 – Aerobic – 5k pace – 3 x 1600m with 60 seconds rest.

Day 2 – Anaerobic – 800m pace 4 x 4 x 200 with 30 seconds rest, and lap walk after each set.

Day 3 – Aerobic – Marathon pace – 10 mile run.

Day 4 – Anaerobic – 400m pace – 1 x 350, 1 x 300, 1 x 250, 1 x 200, all at maximum pace with adequate recovery.

Day 5 – Aerobic – 3k pace – 4 x 1k with 2mins. 15 seconds rest.

Day 6 – Anaerobic – 1500m pace – 1 x 1200, 4mins. 30 seconds rest, 2 x 600 2mins. 15 seconds rest, 4 x 300 67 seconds rest.

Age at which Britain's 30 fastest milers achieved their best time

Cram	24	Crabb	25	Horsfield	19
Coe	24	Robson	24	Hutchings	23
Ouktt	25	Yates	24	Whiteman	25
Elliott	25	Rowland	23	Passey	24
Moorcroft	29	Stewart.I.	21	McGuinness	25
Mayock	25	Mckay	25	Stewart.P.	24
Williamson	22	Staines	27	Denmark	21
Gladwin	24	Harrison	27	Reitz	22
Morriell	28	Clement	26	Simpson	25
Auckmer	22	Strang	25	Smith	27

Comparisons . . .

A G.B. male runner reports:-

“I attended an elite training week-end.

The good thing about it was that it was free. The bad thing about it was that the amount of training given was half what I normally do in a week-end.”

A G.B. female runner reports:- I attended an elite training weekend. The lectures were poor, lacking conviction. Compared to the B.M.C. week ends I have attended, these elite week ends have a lot to learn.”

Dangerous Assumptions . . . But Are They?

A mischievous boy on a Southern Counties A.a. course was told by a supervising coach, “You haven't the right attitude to make world-class.” Ten years later, the coach presented him with a plaque to mark his world record 1500 metres. The boy's name was Steve Ovett.

A promising G.B. junior international was invited to a B.M.C young athletes' course to be interviewed. After 14 days there was no reply. A second letter was sent, no reply after 14 days. Two days before the course started, his coach phoned up to say, “He would both like to attend . . .” He was told that it was to late, someone else had accepted our invitation. B.M.C. courses are planned well ahead, no matter how noted an athlete or coach may be, we do not hang around for THEM to bestow a last minute favour to us. Will this athlete concerned make world-class? We doubt it. You see, we have found that world-class athletes are considerate and we've met a tidy few in our time.'t think that should be impossible.

They Keep Battling Away . . .

There is a coach in North London, John Sullivan, who has coached 42 (forty-two) G.B. internationals, half of them middle distance runners, the rest were sprinters. In outer West London, there is a coach, Comrad Milton, who has consistently produced G.B. international runners for the last 30 (thirty) years. In the North West of the country, our B.M.C. Chairman, Norman Poole, has a record second to none, for filling places in the G.B. team from his squad.

These men are out on the track several times a week in all weathers. Sometimes they get financial rewards for their efforts, when added up, these rewards amounted to an average of one pound a week, that's fifty two pounds a year for thirty to forty years, around £1,500 to £2,000. Meanwhile, part-time U.K. Athletics coaching administrators, get £3,800 a year. County A.A. coaching secretaries did the same job for years for nothing. Is it not time that Il Level coaches actively engaged in coaching receive the same remuneration as these part time coaching administrators?

Coaches – This is Your Destiny

“Athletes do not come to me because I've got blue eyes. They come to me so that I can help them to run faster.” (Harry Wilson). Well said, Harry, if all coaches remember this, sooner or later a Seb Coe will emerge. If, every year, all the athletes in a coach's squad improve, he/she have done their job. If only half of them have improved and they haven't been ill or injured, the coach has to make some decisions. Are the non improving athletes turning up regularly for training? Are they doing the required work when the coach isn't around? if the answer to these questions is positive, the coach has to examine the methodology. The age old philosophy is – UNDER DISTANCE FASTER, OVER DISTANCE SLOWER – THE DISTANCE FASTER.



How they trained

An historical survey of Olympic Games 800 metres gold medallists.

1956 Olympic Games –

TOM COURTNEY – 6 feet 2 inches tall (1.880m), weighed 183 pounds (83k) – best times:- Mile/4:07; ¼ mile/2:56; 1k/2:19.3; 1,000 yds/2:08; 880yds/1:46.8 (WR); 800m/1:45.8; 600/69.5secs (WR); 400m/45.8; 220yds/21; 100yds/9.7.

Winter

Training- Day 1-10x 330yds in 36 secs, walk 330 Recover. Day 2-¾ mile in 3mins (60-65-55). 10 mins walk recovery. Day 3-As for Day 1. Day 4-Acceleration sprints on grass. Day 5-As for Day 1. Days 6 & 7 – REST.

Summer

Training Day 1-4 x 330yds in 32 secs. Walk 330 Recover. Day 2-¾ mile in 3mins (60-65-55) 10mins walk recover. 2 x 330 yds in 33 secs. Day 3 – Either 660 yds in 78 secs. Or 3 x 330 Yds in 31-32secs with 330 walk recover. Day 4-REST. Day 5-3 x 80yds fast with walk/jog after each. Day 6-Race. Day 7-Rest.

Warm up

Routine Very little! Jogged a mile followed by 4 x 110 yds at sprint speed.

Observations

His main asset was basic speed. His height/Weight ratio was 4 pounds lighter than the average sedentary man of the same height. His volume of training in the winter was about 14 miles. In the summer about 12 miles a week.

1960 Olympic Games –

PETER SNELL – 5 feet 10 1/2inches tall 1.79m, weighed 177 pounds (80kg). Best times:- Mile/3:54.1; 880yds/1:45.1; 800m/1:44.3; 1k/2:16.6; 44yds/47.9 (allegedly ran 45secs in a 4 x 400 relay).

Winter

Training 10 weeks of 100 miles a week, which included a 22 Mile Sunday Morning run. 6 weeks of hill running which included a fartlek element. Cross-country Races and even marathon racing were encourages.

Summer

Training Always a 22-miler on Sunday. Three basic sessions were done weekly:- 1) 20 x 400 jog 200 recovery. 2) Two miles of 50 metre sprints and 50 metres at good pace. 3) 200s flat out. His coach was also fond of time trials at 3k and 5k distance. And

Sessions at different “efforts”, these were a choice of quarter, half or three quarters effort. Each effort was a 10-second difference. For example a mile at quarter effort would be best mile time plus 30-secs, half effort would be plus 20-seconds three-quarters = plus 10 secs. In practical terms, one of Snell’s workouts was a mile in 4:24 followed by another in 4:04. Another was 880yds in 1:59, a mile in 4:24 and another 1:59/880.

Observations

Snell’s height/weight ratio was the same as sedentary man of the same height! In the 1964 Olympic, he went on better winning not only the 800 metres but also the 1500m (3:38.8). He entered into running from tennis. Naturally Power fully built, he did no specific strength training. Many regarded him as a freak, defying the laws of Gravity with his weight and apparent limited speed At 400 metres. Any system of training that breaks world records and gains three Olympic gold medals is worth of study.

THE FORMULA- THE MINIMUM AND THE MAXIMUM

The writer received a letter from a university lecturer who said he was doing research into training methods to find the least common denominator, and could I help. Well, there are only so many ways of making a Christmas Pudding. If we depart from the basic formula, it ceases to be a Christmas pudding! So, here we go, common facts for success. There are not ifs and buts.

WEIGHT/HEIGHT RATION – If you’re a male 5’10” tall (1.778m) and sedentary, you should not weigh more than 165 pounds (74.8kg). For running purposes you need to be 10% less, that’s 149 pounds (67.5kg). If you are a female 5’5” tall, (1.651m) and sedentary, you should not weigh more than 125 pounds (56.6kg). For ultimate success, your running weight should not be more than 113 pounds (51.2kg). If you are overweight, do more running in the MORNING and avoid high saturated fat food.

VO2max. Males should have a figure of over 75mls.kg.min. Females should have a figure over 65mls. On a 15-minute test run around a track, you need to be able to run 5,600m in the time (male). Females need to run 4,800m. If you cannot do this, include a 3k pace session once a week. For example, 4 x 1500 with 3mins, rest, each 400m should be about 4-

Faster

“What we ask athletes to do is quite simple, really” (Harry Wilson). Too true, my old friend. We have an athlete with a best 800 metres time of 2 mins.16secs. Let’s apply the age old formula:- UNDER DISTANCE FASTER - This could be 8 x 200 full out, with 3 minutes’ rest. OVER DISTANCE SLOWER – This could be 10 x 400 in 72 seconds, starting with 90 secs recovery and decreasing by 15 seconds a time, ie. 90-75-90-45-30-15 seconds, then back to 90 seconds again and repeat. THE DISTANCE FASTER – The athlete has already done two laps back to back in 68 seconds, not much point in training at the same speed. Time to progress. We can try 1.600 in 99secs with 2 mins.15secs rest, then 1. 200 in 33 secs. Walk a lap recover. Then, 1 x 500 with 2 mins rest, plus 1 x 300. Walk a lap. Then, 2 x 400 with 90 secs rest. Walk a lap. Then, 4 x 200 with 45 secs rest. Another day, we can do exactly the same with DOUBLE the rest to get greater speed. We need to bind these sessions together with some steady running the next day after each track session, a minimum of 35 minutes and a maximum of 70 minutes. If this 2:16/800 athlete doesn’t improve 2:12 within 12 weeks, we’re Dutchmen!

seconds slower than for your best average time in the 1500 metres. If you are doing a 3k session once a week, run the 10k distance three times a week 12-seconds per 400m slower than in your best 1500m. If you can run a mile in 5-minutes, you need to run 10k in 5mins.48secs a mile. If you are overweight, this will soon burn off the fat.

SPEED – Males should be able to spring 40yds (36.6m) in less than 4.9secs; females – less than 5.4secs. if you are way off the time, start strength training on your legs every other day for at least 12 weeks. Hopping 25 metres uphill, one-legged half squats with half bodyweight across your shoulders is a good start. Also, start sprinting 60 metres every other day. If you cannot meet the target, take up the marathon.

VOLUME – Ten miles a day average throughout the year is adequate. This can be a 20 – miler and five runs of 10- miles, per week. Anything more is a complete waste of time and energy.

QUALITY RUNNING - One-third of your total volume of running should be divided as follows:- a) Race pace. B) Faster than race pace. C) Slightly slower than race pace. Here is an amazing statistic – if you ran 2-miles flat out daily it would be better than running 16 miles slowly! If you ran 10k flat out daily, it would be better than running 40k slowly. Want a reference? Look up Dudley’s work, then look up Holloszy’s work. The writer didn’t know it, but in 1950, he ran 2-miles flat out every other day for six weeks. On other days he ran 6-miles slowly. He then competed in the Portsmouth to Southampton road relay, smashing the 4-mil course record, moving



from ninth place to second place. Forty years late, he realised what the 2-mile runs were worth after reading Dudley's work!

RESTORATION – After every four weeks of consecutive training, make the fifth week half the normal average. Experiment with training three days consecutively and spending the fourth day swimming a mile or cycling 16 miles. The greatest cause of injury is training on too many consecutive days.

NUTRITION – Eat every 4 hours on the dot. You require blood-forming and iron rich foods. Number one is FOLIC ACID in huge amounts (Liver, green vegetables, kidneys, egg and wholegrain cereals). Number two on the list is VITAMIN B12 (liver, organ-meats, meat, fish, dairy produce, eggs and brewers' yeast). Number three is VITAMIN C (Fruit, green vegetables, broccoli, brussel sprouts, cauliflower, liver, kidney, potatoes, rose hips). VITAMIN B6 is number four (Meat, fish, egg, wholegrain cereals, bananas, avocados, nuts, seeds and some green leafy vegetables). Next comes ZINC (Fresh oysters, ginger root, muscle meats, pecans, split peas, brazil nuts, beef liver, non fat dry-milk, egg, whole wheat, rye, oats, peanuts, lima beans, almonds, walnuts, chicken, buckwheat, hazelnuts, clams, green peas, shrimps, turnips, parsley, potatoes, garlic, whole wheat bread, carrots, beans, raw milk and corn). Finally, IRON. Some may think this should come first, unfortunately IRON ON ITS OWN IS PRACTICALLY USELESS! It requires all the aforementioned for it to be fully absorbed. If you are a vegetarian, you are up against it, iron in vegetables is not so bio-available as iron in meat. If in doubt TAKE A SUPPLEMENT THAT INCLUDES ONE OR MORE OF THE NUTRIENTS LISTED, do not take iron on its own. Foods that command regular taking are: - All curried foods, organ meats, egg, legumes, cocoa, cane molasses, shellfish and parsley, raisins, dates, spinach and blood sausage. Curry powder has the highest concentration of iron per ounce.

You require one first-class protein a day. Make your breakfast your protein meal. Drink half a pint of fat-free milk, have an egg, eat a bowl of whole grain cereals.

Our bodies require fuel. The most efficient fuel is carbohydrates. They are preferentially oxidised. Carbohydrates are classed into two categories with regard to fuel: 1) High glycaemic. 2) Low glycaemic. Runners need to start a training session with a good store of low glycaemic carbs. Eat four of the following daily:- Drinks that contain fructose. (Look on the label for the word FRUCTOSE. If you can't see it listed as one of the ingredients – don't buy it.) Soya beans, kidney beans, lentils, sweet potatoes, apples, oranges, whole-wheat spaghetti, oats, brown rice, buckwheat pancakes, whole wheat bread. A sign of poor glycogen stores is when halfway through training session, you fade badly. Glucose drinks are high glycaemic, they can be taken immediately after training when glucose levels will be low. A good carb. Polymer drink is a good investment.

THE INSTANT COFFEE SYNDROME DOES NOT APPLY! One training session



Wythenshawe 23.5.01. BRADLEY DONKIN (103) leads from GRANT CUDDY (105). photo by Mark Shearman.

takes, hopefully, 10 days to bring about improvement in the body. From scratch, it takes 36 weeks to bring about total efficiency in all our systems. Big improvements occur every 12 weeks, we should get stuck in to training for 12 weeks at a time. We can actually time our peaks in 12-week cycles. We have to say to ourselves, "The next 12 weeks are crucial." An example of this is Tim Hutchings who prepared for the Los Angeles Olympics 5k immediately after getting a silver medal in the World Cross-County Championships. April, May and June, were devoted to qualifying for the team. July, August, were devoted to 5k, 3k and 1500 metre speeds. He went to Los Angeles not having broken 13mins.20secs for 5k. In the final, he improved 9-seconds to 13mins.11secs, to finish fourth, missing the bronze by a metre. That's real peaking! The last mile was run in 4mins.03secs. Well, this is a personal view. Many will disagree with a lot of it. No need to be cynical, just write to us and tell us what you think the FORMULA FOR SUCCESS SHOULD BE.

Just one more thing. RUN AND DO LESS THINKING! Grasshopper minds don't achieve success. There comes a time when asking everyone for advice has to stop and you make a decision to follow a pattern of training. Peter Coe did this in 1975, he consulted four coaches. He decided that the 5-pace system of training was "all embracing", and adapted it to train his son. A good decision! investment.

Coaching Middle Distance

By Kevin Prendergast, Australia

Coaching middle distance runners is a challenging task. In the following text the author looks at energy systems involved in middle distance performance, outlines training programs to develop these systems and analyses how dominant performance capacities can be exploited in racing.

An examination of what middle distance means, and what it involves, gives us some indication of the training required. It turns out too to be a many-faceted event group, requiring a number of different attributes to be developed. This makes a training program quite complicated and full. However that should not deter a coach-there are no 100% right programs, and provided a coach thinks, analyses and learns, her/his coaching will be as good as most.

WHAT IS MIDDLE DISTANCE

We all know that middle distance is the 800-1500m event group. But why is it so called, and how does it differ from the other races? We obtain some idea about this when we look at the speed of men's world records from 100m to 10,000m. These are shown on the graph



Coaching Middle Distance (continued)



Watford, 9.6.01. EMMA DAVIES leads the 800m from winner ALLISON CURBISHLY (left) and MOIRA PRENDEVILLE photograph by Mark Shearman

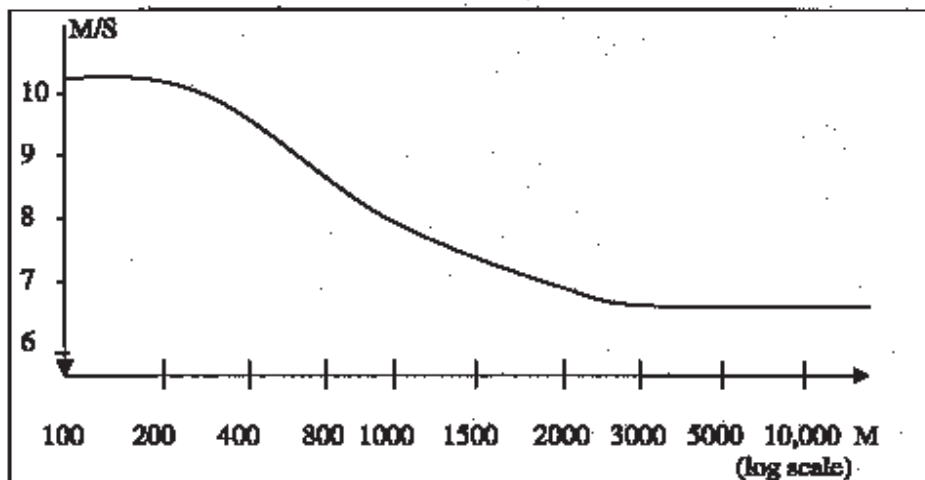
below. (The horizontal axis is in log scale, so as to accentuate the spring range).

As the graph shows, both the sprints and the distance events are characterised by fairly constant speed. Doubling the distance from 100 to 200m has very little effect on speed, which remains above 10 meters per second, while doubling from 5000 to 10,000m results in reduction in speed less than 5% to just above 6 meters per second. However moving from 400 to 800m results in a fall in speed of 15%, the greatest fall for any distance doubling, thus well separating the 800m from the sprints. (The 400m is not a complete sprint, its speed being 9% away from the 100 and 200m, but it is much closer to the 100/200m than to the 800m).

From 800m through to 2000m distance doubling causes speed reduction of 10%. Thus this event range is quite distinct from the two on either side of it. It is significantly slower

than the sprints, which separates it from them, and the speed is very much distance dependent, which separates it from the distance events as well as the sprints. It is a distinct event group, in the middle of two other distinct event groups, so we call it middle distance. Each has its own characteristics and attracts a particular type of runner.

The really distinguishing feature of middle distance is this drastic fall-off of speed with distance. The reason for this is lactic acid. The speed is greater than the maximum aerobic effort of distance running, so the air we breathe is not sufficient to fuel the effort. The lactic system is invoked, which is more powerful than the steady-state aerobic system, but at a cost, and the cost is a build-up of lactic acid, which inhibits the performance of the muscles. So as the distance increases we run slower, in order to slow down the build-up of lactic acid. (If we slow down sufficiently there



Men's World Records - Speed and Distance

is virtually no lactic build-up, and we could continue for half an hour or so, but this is distance running).

THE INGREDIENTS OF MIDDLE DISTANCE RUNNING

We have already touched on one essential ingredient, the ability to utilise the lactic energy system. This is one of three energy systems, all of which are important in middle distance running.

For each energy system there are two aspects, namely power and capacity. Power is the rate at which the energy can be delivered while capacity is the total amount of energy can be delivered while capacity is the total amount of energy available to the runner. Power produces running speed and capacity enables running endurance.

The energy systems are:

Aerobic System

This system uses glycogen as fuel in the presence of oxygen. It is a steady state system, in which the energy output is dependent on oxygen input. At its maximum, i.e. maximum rate of oxygen input, it can be sustained for 30 minutes or more. It is the energy system of distance runners. Its power, or maximum rate, is determined by the anaerobic threshold, which is the effort beyond which oxygenise insufficient and a more powerful energy system is required. Its capacity is obviously not determined by the amount of oxygen, since there is plenty of that, but by the amount of glycogen in the muscles, (Fat is also available, which is accessed by marathon runners, but the distinction is not really relevant to middle distance running).

Lactic System

The next energy system is the lactic system, which is invoked when the speed is too great for the aerobic system. This system is anaerobic, i.e. it works without oxygen. It is more powerful than the aerobic system, but does not have as much capacity, it runs out much sooner. The system produces lactic acid as a by-product and this inhibits the action of the muscles. This is responsible for deceleration and eventual shutdown.

The power of the lactic system is determined by the rate at which lactic acid can be produced, and the capacity by the extent to which it can be tolerated. Both can be trained.

Creatine Phosphate (CP) System

This is the most powerful system of all, but the smallest capacity. It is the main system of sprinters, particularly 100m runners, and for these runners it is no longer available after about 7 seconds of effort. However there is evidence (in the form of 400m runners) that if you do not call on it so violently, it will last up to about 25 seconds. For a middle distance runner it is the longer duration capacity which counts, though for 95% speed to be satisfactory, 100% must be good.

THE HUMAN ENGINE

The energy systems are like fuels for a motorcar, while the muscular structure is like the engine. In a runner, as in a car, we can have high quality well developed fuels, but if



the engine is deficient the performance will suffer.

The muscular system must be well developed to apply the forces generated by the energy systems at the necessary speed. Whether the development of the muscular system requires a weight program is for the coach to determine, but if it is deemed necessary the coach must remember what it is for and stop if it is not giving the desired results.

Furthermore the forces must be applied in the right direction, with the right timing, otherwise energy is wasted and optimum performance is impossible. This means concentration on style. Just as an engine must be finely tuned and balanced, so a running action must be smooth. This probably won't just happen; a good action must be developed with fine attention to detail and continuous quest for perfection.

TRAINING

The training program must develop all of the above energy systems, the muscular system and style. That involves many more sessions than can be fitted into one week so a complex training program stretched over a whole year is probably necessary. Programming is a subject in itself and I will not attempt it here.

However below (Table 1) are listed a number of different sessions and their purpose.

How the sessions in Table 1 are combined to form a 12-month program is a complex matter. There is probably no uniquely correct solution, and much will depend on the athlete's strengths and weaknesses. Also the external environment, i.e. those matters beyond the control of athlete and coach, will have an influence in shaping the program.

There are two issues to take into account in putting together the sessions to form a program. The first of these is the question of how long a training effect lasts when the effect is no longer being trained. For example, if an athlete only does aerobic work in winter, how long into the competition season is the effect of the work still present?

The second is the question of how long a particular session can be continued (how many

• 30-60min. easy run	-aerobic capacity
• 20min. run, just above steady-state	-aerobic power (anaerobic threshold)
• Repetition 3-10min. runs, 1-3min recoveries	-aerobic power/lactic capacity
• Repetition 1-2min. runs, 2-4min recoveries	-lactic capacity/aerobic power
• Repetition 45-90secs. Runs, long recoveries	-lactic capacity/lactic power
• Few 30-45sec runs, long recoveries	-lactic power
• Repetition 30-45sec runs, reducing recoveries	-lactic capacity
• 15-30sec runs, long recoveries	-CP capacity
• 6-15sec. Runs, few minutes recoveries	-CP power
• Weights, near max. few reps	-muscular strength
• Weights 30-70%, 10-15 reps, fast	-muscular power
• Circuits (body wt)	-muscular endurance
• Hill runs, 5-10sec.	-CP power, muscular endurance
• Hill runs, 15-30sec.	-Lactic power, muscular endurance
• Technique	-economy and effectiveness of effort
• Rest	-allows adaptation

Table 1

weeks), before it is time to move onto something else. It might be the law of diminishing returns which means it is time to move on, or it might even be that the effect becomes negative, or it could simply be that other work needs to be done.

Of course, even after a good program is prepared it will be necessary for a coach to vary it to take account of the athlete's progress or lack thereof. In this context it is essential that a coach know what effect he/she wants from a particular session, and removes the session from the program if it is not delivering the desired results.

THE ANATOMY OF THE RACE

The traditional middle distance events, the 800m and the 1500m, have much in common, and more often than not, attract the same runner. However they can be very different in the way they are run. For instance, it is not uncommon for the last lap of an international 1500m to be run in 52 seconds. However, if an international 800m runner was to run the last lap in 52 seconds, he would probably have run the first in about 50 seconds and would be very close to the world record, and that would be most uncommon.

Typically the 800m is a deceleration run from start to finish. In the first 200m the runner uses

his CP capacity and from then on he has to rely on lactic power for speed, lactic capacity for endurance, and aerobic capacity for support. As lactic acid accumulates the runner slows down and in the final 200m what appears like acceleration is often purely relative to other runners. Of course there are occasions when acceleration in the last 200m is possible, following an easy early pace, but this is uncommon in 800's.

So an 800m runner needs CP capacity to set up a good though comfortable pace, lactic power to keep the pace up, and lactic capacity to maintain it. But he also needs aerobic power, because the faster his steady-state pace the less he has to rely on lactic energy, and the less the accumulation of lactic acid-which means his deceleration is less.

The 1500m does not rely to any significant extent on the CP system. However, if the pace is even it is still considerably faster than the aerobic system would allow, so the lactic system is most important. Since the race is twice the duration of the 800m, lactic accumulation is a very real concern.

This is addressed in two ways. The first is a better tolerance of lactic acid. The second is a more highly developed aerobic system, which places less reliance on the lactic system (the steady-state pace being faster). The second explains why some 1500m races have such fast last laps. For a runner with a highly developed aerobic system the first 2 ¼ laps can be run aerobically if the pace is not forced. He can then spend all his lactic energy in the last lap, which enables him to run 52-53 sec. Obviously a successful 1500m runner should have this facility in his armoury.

HOW FAST IS MIDDLE DISTANCE

The world record for the 1000m is at a speed which is about the average of the speeds of the 800m and 1500m world records. Therefore we can think of the 1000m as representing the middle distance events. Let us compare its speed to that of the sprint and the distance events.

The 10,000m is 10 times the length of the 100m and the speed is 19% slower. The 100m is one tenth the length of the 1000m, and the speed is 34% faster.

Thus in terms of running speed middle distance is closer to distance than to sprints. This is why a superb athlete, like Said Aouita, could straddle the middle distance and distance successfully, whereas one competes in both pure sprints and middle distance at



Watford 9.6.01 NEIL SPEAIGHT (106). GRANT CUDDY (102) photo by Mark Shearman



One Mile British Year List 1921 – 1950

1921	A Hill 4:13.8	1927	C Ellis 4:17.0	J Moore 4:17.4	1941	S Wooderson 4:11.2 (?)
H Stallard 4:14.2	H Stallard 4:18.8	H Stallard 4:18.8	R Thomas 4:20.0	S Tomlin 4:18.0	(No other marks under 4:18.2)	
D McPhee 4:26.6	J Moore 4:19.5	J Moore 4:19.5	J Robins 4:20.4	J Helps 4:21.6	1942	
1922	H Stallard 4:21.0	S Ashley 4:22.4	J Helps 4:21.6	1933	S Wooderson 4:16.4	
D McPhee 4:23.8	D McLean 4:23.0	D McLean 4:23.0	R Thomas 4:14.2	T Riddell 4:15.0	J Alford 4:17.4	
C Griffiths 4:25.4	J Langridge 4:24.2	J Langridge 4:24.2	T Riddell 4:15.0	C Ellis 4:20.2	1943	
W Tatham 4:28.8	U Morgan 4:24.6	1928	1934	S Wooderson 4:11.5	D Wilson 4:14.0	
C Blewitt 4:28.8	R Starr 4:19.6	R Starr 4:19.6	S Wooderson 4:13.4	J Alford 4:15.0	1944	
1923	S Ashley 4:20.0	S Ashley 4:20.0	J Cornes 4:13.5	S Wooderson 4:12.8	D Wilson 4:13.4	
C Blewitt 4:21.6	C Ellis 4:20.0	C Ellis 4:20.0	A Reeve 4:14.8	1945	S Wooderson 4:04.2	
J Stallard 4:21.6	R Thomas 4:20.2	R Thomas 4:20.2	T Riddell 4:19.0	D Wilson 4:11.4	1946	
W Porter 4:21.8	F Tilbury 4:21.2	F Tilbury 4:21.2	D McLean 4:20.2	D Wilson 4:16.0	1947	
W Seagrove 4:22.5	J Langridge 4:22.6	J Langridge 4:22.6	1935	No Athletes under 4:15.7	1948	
M Pugh 4:23.2	H Johnston 4:23.8	H Johnston 4:23.8	R Graham 4:12.0	1949	W Nankeville 4:14.2	
H Johnston 4:23.7	1929	U Morgan 4:16.4	S Wooderson 4:12.7	W Nankeville 4:08.8	D Wilson 4:14.8	
D McPhee 4:24.0	U Morgan 4:16.4	R Thomas 4:20.8	J Stothard 4:15.8	R Bannister 4:11.1	R Morris 4:11.8	
W Milligan 4:25.0	R Thomas 4:20.8	W Tym 4:21.8	A Reeve 4:17.4	L Eyre 4:12.8	D Wilson 4:13.4	
H McGuinness 4:26.6	C Ellis 4:22.0	C Ellis 4:22.0	B Eeles 4:18.6	R Morley 4:13.8	A Parker 4:14.8	
B McDonald 4:27.3	C Green 4:22.2	C Green 4:22.2	T Riddell 4:20.0	1950	R Bannister 4:09.9	
W Cotterill 4:27.8	S Ashley 4:22.2	S Ashley 4:22.2	1936	L Eyre 4:11.8	W Nankeville 4:12.2	
G Webber 4:28.8	S Tomlin 4:22.4	S Tomlin 4:22.4	S Wooderson 4:10.8	A Parker 4:14.0	T White 4:15.0	
1924	H S Townend 4:23.0	H S Townend 4:23.0	R Graham 4:12.5	D Wilson 4:15.0	J Ashley 4:15.0	
W Seagrove 4:21.2	E Franklin 4:23.4	E Franklin 4:23.4	B Eeles 4:17.6	These statistics drawn from the ATFS publications "Track and Field Through The Years". Our thanks for their permission to re-produce them.		
H Johnston 4:21.8	F W Turner 4:23.8	F W Turner 4:23.8	1937			
W Porter 4:22.2	H S Cook 4:24.5	H S Cook 4:24.5	S Wooderson 4:06.4			
A Clark 4:23.4	1930	R Thomas 4:14.0	J Emery 4:13.8			
G Webber 4:23.5	R Thomas 4:14.0	J Cornes 4:17.0	D Pell 4:15.4			
C Ellis 4:23.6	J Cornes 4:17.0	R Trapnell 4:19.2	R Graham 4:15.9			
(No Others Under 4:28.4)	C Ellis 4:20.2	C Ellis 4:20.2	B Eeles 4:11.4			
1925	T Riddell 4:21.0	T Riddell 4:21.0	J Stothard 4:16.4			
B Macdonald 4:18.0	S Tomlin 4:23.0	S Tomlin 4:23.0	R Thomas 4:17.0			
C Ellis 4:18.4	H S Tonend 4:23.2	H S Tonend 4:23.2	B Wright 4:17.2			
D Lowe 4:21.0	U Morgan 4:23.3	U Morgan 4:23.3	P Ward 4:17.8			
H Stallard 4:21.2	H Hedges 4:24.2	H Hedges 4:24.2	1938			
R Starr 4:22.0	1931	R Thomas 4:13.4	J Alford 4:11.5			
H Johnston 4:23.6	R Thomas 4:13.4	C Ellis 4:16.2	S Wooderson 4:13.4			
(No Others Under 4:27.0)	C Ellis 4:16.2	D Price 4:17.4	D Pell 4:14.2			
1926	D Price 4:17.4	T Riddell 4:18.0	B Eeles 4:15.2			
T Riddell 4:18.4	T Riddell 4:18.0	H Hedges 4:21.2	J Emery 4:16.2			
R Starr 4:18.6	H Hedges 4:21.2	A Harris 4:21.4	1939			
A Johnston 4:21.8	A Harris 4:21.4	S Tomlin 4:21.4	S Wooderson 4:07.4			
D Lowe 4:25.0	S Tomlin 4:21.4	J Helps 4:21.6	D Pell 4:12.0			
J Moore 4:25.8	J Helps 4:21.6	J Cornes 4:22.0	A Collyer 4:15.0			
B McDonald 4:26.0	J Cornes 4:22.0	R Hadland 4:23.3	J Alford 4:15.8 (?)			
A Houghton 4:26.0	1932	J Cornes 4:14.2	1940			
T Fooks 4:26.2	J Cornes 4:14.2	C Ellis 4:15.8	S Wooderson 4:11.0			
C Ellis 4:26.2	C Ellis 4:15.8	1921	F Close 4:17.6			
M Young 4:27.0	1921	A Hill 4:13.8				
D White 4:27.4	H Stallard 4:14.2	D McPhee 4:26.6				

LETTERS TO THE EDITOR . . .

1500/Mile

Dear Sir

In Frank's article on page 6 of BMC News he refers to a World Record Women's 1500min 1969 at Leicester (14/6). It was actually a ONE MILE race! Advertised as "Mile of the Century" it was run by Marian Gommers in 4-36.8 beating Anne Smith's 4-37.0 - See AW 21st June 1969 page 5.

I was there as I was at the time coaching Margaret MacSherry who finished 7th.

Brian Boulton - Croydon.

Founding Fathers (and Mothers)

21st February 2002

Dear Sir

First of all may I congratulate you on a great issue of BMC News. It is significant that a very high standard has been maintained.

This leads me nicely to the foot of page 6. Whilst Alf and Frank were undoubtedly instrumental in much of what was done in the formation of BMC it has long been recognised that they were not the only founder members.

My understanding is that the founder members were: Frank Horwill; Alf Wilkins; Maureen Smith; Wilf Paish; Brian Buxton; John Thresher and myself. This is slightly at variance with what is written on page 22 of Frank's book "Obsession For Running" but is taken from one of the very earliest copies of BMC News the relevant page clearly having been typed by Frank himself!

I also have a list of the founder members produced by Frank some eight years late in which the names of Henry Hayes and Gordon Pirie had been included. Although I cannot recall ever meeting Henry Hayes his is recorded as the first BMC treasurer. However, I do remember Gordon Pirie coming to what I think was the second committee meeting.

Much has been done over the years and without the contribution made by so many members the club would not be in its current strong position. In the early years our survival owed much to the work put in by Frank and the Regional Secretaries, coupled with the desire to succeed, but also not forgetting the financial support from Frank the "anonymous donor", without which I feel sure the club would have been insolvent.

Yours sincerely

Brian Boulton



Muscle Fatigue Saturation Transforms Athletes

Mark was a 3mins 48secs 1500 metres runner. He made a visit to the weekly circuit training session conducted in the Thames Valley Harriers' clubhouse. He finished last, totally exhausted. He phoned me up and asked how he could get into better shape muscular endurance wise. I told him about muscle fatigue saturation (MFS). Eight weeks later, he visited his club's circuit training session again. The supervising coach (Pat Fitzgerald) phoned me up. "What have you done to Mark?" I asked why. "I've never seen an athlete transformed so much. He was sitting down twiddling his thumbs while he watched the others finish."

M.F.S. is simplicity itself. The athlete starts off with one exercise a day. This exercise is done to maximum three times with 60-seconds rest after each maximal exercise. A typical result for the first-timers usually follow this pattern: 1st effort – 60 press ups. 60secs rest. 2nd effort – 50 press ups. 3rd effort – 25 press ups. A total of 135 press ups. Next day, a different muscle group is used, this could be bent-knee abdominals. A typical week would be: Day 1 – Press ups. Day 2 – Abdominals. Day 3 – One-legged half squats onto a chair. Day 4 – Squat thrusts. Day 5 – Chin the bar. Day 6 – Step ups with a disused car tyre around the neck filled with 50kg of sand. (This is more comfortable and safer than using a bar bell with weights.) The leading leg is changed every 30-seconds. Day 7 – Dips from a chair.

After the first week, two exercises are used on the same day using different muscle groups. Each week a further exercise is added daily. When all seven exercises are done in one outing, the frequency of exercise is changed to every other day and ways of making the exercises harder are sought, for instance, one-legged squats with the tyre around the neck; press ups with the feet inclined; abdominals with the legs inclined.

After eight weeks, the athlete is tested for strength gains. These include one off efforts at press ups, abdominals, squat thrusts, chins, 25 metre hop on each leg, 40 yds (36.6m) sprint from a static start (males should get well under 5-seconds, females 6-seconds.) Phenomenal gains in muscular endurance are usually recorded, one such was a female who could only do 34 (thirty-four press ups). After eight weeks, she recorded 94 (ninety-four)! But, the significant point of M.F.S. is that basic speed is improved in the 40yds (36.6m) dash. The writer believes that there is a correlation with speed at this distance and performance at 400 metres. The formula being: $10 \times 40\text{yds time} + 2\text{-seconds} = 400\text{ metres potential for males, and plus 3-seconds for females.}$ An actual example, was an athlete new to me, who recorded 4.9secs for the 40yds. The writer told him he should be able to run 51secs/400m. he replied that this was his best time! This athlete also fitted into another of the writer's forecasts. His 400 metres time plus 4-seconds $\times 2$ should be his best 800 metres time. He ran 1:49.9! The 4-second rule requires maximum endurance to achieve. Many 800 metre runners are way of this conversion, for example, Juantorena had a time of 44.2secs/400 metres, and 1:43.4/800 metres. That's $44.2 + 7.5\text{secs} \times 2$. He had plenty of speed, but little endurance.

This article is not out to decry orthodox circuit training. If one correctly, gains in power and muscle endurance are ensured. However, many classes are conducted in a carte blanche routine. For example, it is stipulated that all exercises, or most of them, are done 20(twenty) times. A series of exercises around a gym, when completed constitutes a circuit. Three circuits non stop completes the session. When the time for the trio of circuits can be improved by 10 per cent, the number of repetitions per exercise is increased, in this example, this could be to 25 (twenty-five). This is better than nothing, however, it's not personalised. Some athletes may be overworked, others under-stressed.

The late Harry Wilson (Ovett's coach), operated a duration type of circuit. All exercises were done for 60-seconds' duration, athletes then moved on to the next station where a different exercise was done in the same way. A similar process, but not strictly circuit training, is where all the athletes do the same exercise together for 60-seconds' duration with the same time as recovery. A minimum of six exercises are executed. The process is repeated three times.

A personalised circuit is where each athlete is first tested to maximum

for each of the exercises in the circuit, with a 60-second rest after each. On the actual circuit, each exercise is performed to HALF maximum. The circuit is completed three times. When the total time for a complete session has been markedly improved. Athletes are re-tested.

The writer, having used various strength training routines, is convinced that M.F.S. is superior to most other methods. To summarise:-

- 1) M.F.S. exercises can be done at home, requiring little or no equipment.
- 2) One exercise a day is done to maximum three times with 60-seconds' rest.
- 3) A different muscle group to that done the previous day must be selected.
- 4) After one week, two exercise are done daily. Each week a new exercise is added daily.
- 5) When seven exercises can be completed in one session, workouts are switched to every other day in the winter and to once a week in the summer, several days before any competition.
- 6) The time taken to complete a seven-exercise M.F.S. session ranges from 42-minutes to 60-minutes.
- 7) When one trio of an exercise is completed, there is a 2-minutes break before the next trio is tackled.
- 8) All exercises must be performed correctly; it's pointless to cheat!



Watford 9.6.01. PAT DAVOREN. photo by Mark Shearman.



“Bannister lets Britain down . . .”

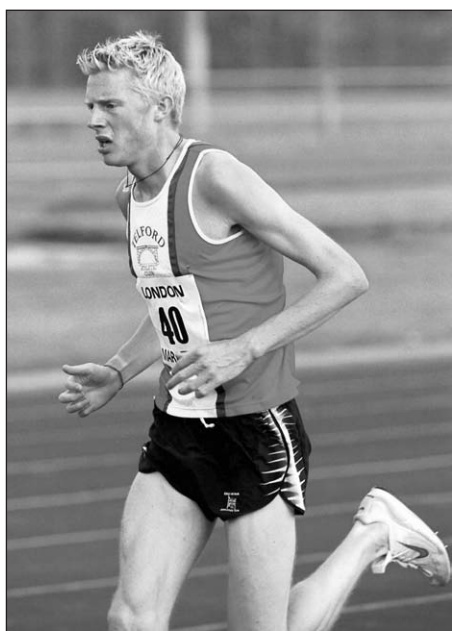
These were some of the headlines that greeted Roger Bannister when he returned from his first and only Olympic Games in 1952. Other sports columnists observed, “Bannister is just not tough enough. . .” and “Bannister’s training methods are wrong..” However, in coming fourth in the 1500 metres Olympic final, in the time of 3min.46secs., he succeeded in breaking the Olympic record. But, this was not considered good enough by the Press who seemed to have it in for the young miler long before the Games occurred. Why was he given automatic selection for the 1500 metres? Why did he choose not to run in the A.A.A. mile championship? And instead ran and won the half-mile in 1min.51.5secs. He was also accused of “training in secret”. Also, the fact that, at the time, he was self-coached, appeared to be “arrogance bordering of conceit . . .”

However, in a time-trial ten days before the Helsinki final, helped by Chris Chataway, he ran three-quarters of a mile in 2min.52.9secs (58.5 – 57.5 – 56.9), easily a world record for the distance. He felt confident. This was to be shattered next day when he read that there would be heats, semi-final and final on consecutive days. There had never been semi-finals before. He knew that his 30-minute training stints daily was not enough to withstand such a schedule. He was beaten before he started.

He sat down and made some vital decisions:

- 1) He would prove that his attitude towards training was right.
- 2) He would run for two more years.
- 3) He would step up his interval training regime, but not the volume. He just did not have the time, his hospital work was becoming more Pressing.
- 4) He would be the first man to duck under 4-minutes for the mile, after all, if he had run a further 44yds in his three-quarters of a mile time-trial, he only needed to run it in 67 seconds.

In February and March of 1953, he ran 10 x 44yds daily in 63-seconds with a lap jog recovery in 2-3minutes. In May, he ran a 4mins.03.06 mile at Oxford, a new British record. Shortly after, he was one of the quartet that broke the British record for 4 x 1500 metres. (15mins.49.6). This record was to be broken 20 years later by a B.M.C. quartet of



Wythenshawe, 23.5.01. OLIVER LAWS. photo by Mark Shearman.

Dave Moorcroft, Chris Stewart, Vic Smith and John Cadman. A month later, Bannister lowered the British mile record yet again, to 4mins.02secs. The Press were not pleased. The race took place in comparative secrecy, slotted into the Surrey Schools Championship, they missed it. They got their revenge. The record was not ratified because the British Amateur Athletics Board deemed the race not to be a BONA FIDE competition according to the rules.

In the winter of 1953/54. Bannister jogged down the road from St.Mary’s Hospital to Paddington track in his lunch hour, where, he was joined by numerous athletes from all parts of London. They did 10 x 440yds in 66-seconds and gradually speeded them up to 61-seconds by April. Brasher took Bannister on a Friday night, to the five-laps to the mile track at Chelsea Barracks where he was to meet Brasher’s coach, Franz Stampfl. There, he was subjected to the “feared” session of 3 x 1½ miles and strength exercises. A mountain-climbing holiday was taken in Scotland. On return, the 10 x 440 yards stint was lowered to 59-seconds average. Two three-quarters of a mile time-trials were done in late April, way off his world record best of 2:52.9.

On the 6th May 1954, in the A.A.A. v Oxford University match, it was decided that this would be IT. However, things didn’t look good. There was a gale blowing. The St. George’s flag on a nearby church stood out parallel to the ground. In such conditions they would be lucky to run 4mins.04secs. Suddenly, the flag went limp. It was on! Brasher took the first lap in 57.5secs. with an impatient Bannister screaming, “Faster!” Stampfl yelled at Bannister, “Relax” at 660 yards. The half-mile time was 1min.58secs. Chataway took it up and struggled to three-quarters of a mile in 3mins 0.7secs. The last lap MUST be in 59-seconds. Bannister crossed the line and collapsed. There was an interminable delay as the time-keepers consulted. Then came the announcement, “Result of one mile . . . time, 3 minutes”, the roar of the crowd blotted out the rest. The record was to last 46 days. John Landy was to capture it with 3mins 58secs recording, 1.4 seconds faster than Bannister, about 13 metres ahead of Bannister in a man-to-man duel.

The scene was set for a clash of the Titans in the British Empire Games mile on the 7th August 1954 in Vancouver. It was dubbed, “The Kicker v The Pacemaker”. No other race

before or since has aroused so much worldwide attention. Landy led through the first quarter in 58.2secs. Bannister was seven yards back. At the half-mile mark, Bannister was fifteen yards back, clocking 1min 59secs. It looked all over. Landy’s superior mile time was telling. But a super-human effort from Bannister halved the distance between them after two-and-a-half laps. At the bell, he was on Landy’s shoulder. But, had the third lap of 59.6seconds by Bannister taken the sting out of his finish? Landy increased his pace from 300 yards out, Bannister was hanging on desperately. The 1500 metres mark was passed one-tenth of a second outside Landy’s world record. At the start of the final straight, Landy glanced over his left shoulder. When he looked ahead again, Bannister had pounced and was past him, struggling to the tape reached in 3mins.58.8 secs to Landy’s 3mins.59.6secs, the first time two men had broken sub 4-minutes in the same race.

For the first time ever in the history of British athletics press reporting, the Sunday papers gave the result in banner headlines, “BANNISTER DOES IT!” These were some of the headlines that greeted Roger Bannister when he returned from his first and only Olympic Games in 1952. Other sports columnists observed, “Bannister is just not tough enough. . .” and “Bannister’s training methods are wrong..” However, in coming fourth in the 1500 metres Olympic final, in the time of 3min.46secs., he succeeded in breaking the Olympic record. But, this was not considered good enough by the Press who seemed to have it in for the young miler long before the Games occurred. Why was he given automatic selection for the 1500 metres? Why did he choose not to run in the A.A.A. mile championship? And instead ran and won the half-mile in 1min 51.5secs. He was also accused of “training in secret”. Also, the fact that, at the time, he was self-coached, appeared to be “arrogance bordering of conceit..”

“WONDERFUL BANNISTER!” and “SUPER BANNISTER”. Within two years, he had gone from vilification to being idolised. Such are the whims of the know-all sports writers.

TRAINING FOOTNOTE: - Many athletics copied Bannister’s 10 x 44yds with 440yds jog recovery in 2-3minutes, recording an average of 60-seconds, but could not break 4-minutes. They forgot his 3 x 1½ miles, his 5 x 880yds and his frequent time-trials over three-quarters of a mile.



Think Trio

Sixty years ago, the novice runner was invariably advised to, "Run under-distance fast, over-distance slow." But, of course, good as this advice was, there was something missing – no mention was made of how to run THE distances and specialise in! Consequently, one often saw a miler come to the track and run 880 yard flat out and go home. He had one his under-distance fast stint. On another day, he would come to the track and run 2 (two) miles 10-seconds a lap slower than per lap in his best mile time. Homage had been paid to the dictate of over-distance slow. The bit in between (mile pace) would look after itself! But, in 1934, a medical student on a Rhodes Scholarship at Oxford University,

decided this was illogical. He trained under-distance (880yds flat out), over-distance (2-miles), and three-quarters of a mile faster than for his best mile time per 440yds. He eventually wrote in his diary, "Running 3-minutes for three-quarters of a mile is becoming easy." He was rewarded for his logic by winning the 1500 metres in the 1936 Olympics in world record time. Jack Lovelock

wrote in his diary afterwards, "It was the most perfectly executed race of my career." His lap splits were – 61.4secs – 63.7secs – 60.2secs – 42.6secs. Another 110 metres, he would have recorded a mile in 4 mins 02secs if he maintained the pace. Nearly a 1min 56secs second half. Alan Storey, national marathon coach, in a lecture at a B.M.C. training day, confirmed his belief in training at three different speeds weekly, when he said, "I give my athletes three basic sessions a week which must be done, after that, they can do what they like."

Here are some combinations for trio training for different events:-

- 800 metres** -
- 400 metres speed – 1 x 350, 1 x 300, 1 x 250, 1 x 200. All at maximum effort with a lap walk recover (LWR) after each.
 - 800 metres speed – 1 x 600 + 1 x 200 with 2mins rest after 600 and LWR after 200. 1 x 500 + 1 x 300 with 90secs rest after 500m and LWR after 300. 2 x 400 with 60secs rest.
 - 1500 metres speed – 8 x 400 with 90 secs recovery declining by 15-seconds in time to 15secs, then resume with 90secs again. e.g. 64secs/90secs rest, 64secs/75secs rest. 64secs/60secs rest etc.
- 1500 metres** -
- 800 metres speed – 75 secs duration running at maximum speed – LWR. 60secs running duration at max. speed. – LWR. Repeat.
 - 2 x 1 x 400 + 1 x 300, 45secs rest after 400, 90secs after 800, LWR after 300 before repeating
 - 4 x 1500 with LWR after each. Suggested speed 4-8 secs per 400m slower than for 1500m per 400m.
- 3k** -
- 4 x 800 with LWR at 1500 metres speed.
 - 6 x 1k at target 3k speed with 2 mins rest.
 - 3 x 2k at 5k speed with 200m WR. Suggested speed 4-8secs per 400m slower than per 400m in the 3k
- 5k** -
- 16 x 400 at 3k pace with 30secs rest.
 - 4 x 1600 t 5k target pace with 100m WR.
 - 3 x 3k at 10k pace with 100m WR. Suggested speed 4-8secs per 400m slower than per 400m in the 5k
- 10k** -
- 7 x 800 at 5k speed with 30secs rest.
 - 6 x 1600 at target 10k pace with 45secs rest.
 - Run half-marathon distance 15secs a mile slower than per Mile in the 10k.
- Half Marathon** -
- Run 10k at maximum effort.
 - Run 2 x 10k at target half-marathon speed with 3mins rest.
 - Run 15 miles, 15secs a mile slower than per mile in the 10k.
- Marathon** -
- Run for the same DURATION as the target time SLOWLY. If the target is 3:03:24 (7mins/mile), run at 8mins/mile. If the target is 2:37:12 (6mins/mile), run at 7mins/mile.
 - Run half-marathon distance at target marathon pace, See above for guide.
 - 2 x 5k at best 10k with 2mins.30secs rest.

All the sessions listed can be classed as KEY ones and can be followed next day by recovery runs lasting from 35mins to 70mins according to how one feels.

There was also another edict in being sixty years ago which has validity today. "Do your endurance work first and follow it with some speed.." This will require running faster when tired and the following sessions meet this need:-

- 1 x 2k at 5k speed (From 64 to 74 seconds per 400m). LWR. 1 x 1600m at 3k speed (Faster than for 2k). LWR. 1 x 1200m at 1500m speed (Faster than for 1600m). LWR 1 x 400m at 800m speed (Faster than for 1200m).
- 1 x 1600 at 3k speed. LWR 2 x 800 at 1500m speed with 3mins rest after first 800m and then LWR 4 x 400 at 800m speed with 3mins rest.



Cardiff, 4.7.01. NATALIE LEWIS. photo by Mark Shearman.

- 1 x 600 at 800m speed. LWR 1 x 500 at faster than 800m speed. LWR 1 x 400 faster per 100m than in the 500m. 1 x 300 at full effort. LWR and repeat if executed well.
- 1 x 3k at 10k pace (11mins.15secs to 8mins.07secs). LWR. 1 x 1500m at 5k pace (4mins.30secs to 4mins). LWR. 1 x 800m at 3k pace (2mins.40secs to 2mins). LWR 1 x 400 at 1500m speed (72secs to 56secs).
- 10k at half-marathon speed (37:30 to 30:00). 4 mins rest 5k at 10k speed (18:45 to 16:15). 2 mins rest 2k at 5k speed (6:40 to 5:05). 2 mins rest 1k at 3k speed (3:30 to 2:30).
- Half-marathon at marathon speed (1:31:42 to 1:05:00). 5mins rest 10k at half-marathon speed (15secs/mile faster than above). 5mins rest. 5k at 10k speed (15secs/mile faster than above).
- Run one lap of the track at your best 5k speed, immediately follow it with a lap at your best or target marathon pace. If you have a best 5k of 16mins.40secs (80secs/400) and your target marathon time is 2:45:56 (95secs/400), you run an 80secs 400 metres followed by a 95secs one, NON STOP for as long as possible. When off the pace, walk a lap recovery and start again. The target is to run 10k in total non stop. This variable pace session is one of THE great sessions for a successful marathon, and when the distance of 10k can be run in this way, the target marathon time is assured.

When the trio of workouts are completed each week, one can line up for a race and feel totally confident that one's preparation has left no stone unturned.

The answer to three vital questions have been answered:-

- 1) Have I done enough under-distance work fast? Yes
- 2) Have I done enough over-distance work, longer and slower? Yes
- 3) Have I rehearsed my specialist distance race pace enough? Yes.



British Sub.4 Men

Name	First sub 4 & Date	Subsequent PB	Name	First sub 4 & Date	Subsequent PB
Richard Ashe	3:59:58 31 Aug 96		Gary Lough	3:59.48 4 Sep 94	3:55.91 27 Aug 95
Roger Bannister	3:59:4 m 6 May 54	3:58.8 m 7Aug 54	Ian McCafferty	3:56.8 m 11 Jun 69	
Spencer Barden	3:58.5 m 29 May 98		Seamus McCann	3:59.84 5 Jul 88	
Matt Barnes	3:58.5 m 25 May 94		Peter McColgan	3:59.37 18 Jul 86	
Maurice Benn	3:59.80 m 3 Jun 68		Ron Macdonald	3:59.7 m 30 Aug 75	3:59.1 m 1 Sep 75
Mike Berisford	3:59.24 m 18 Aug 62		Chris McGeorge	3:58.97 27 Jun 86	3:56.71 5 Jul 88
Johan Boakes	3:58.01 i 25 Jan 91		Jim McGuinness	3:59.2 m 30 Aug 75	3:55.0 m 11 Jul 77
John Boulter	3:59.72 m 3 Jul 65	3:58.6 m 24 Jul 68	Kevin Mckay	3:59.0 m 7 May 89	3:53.64 22 Jul 94
Clifton Bradeley	3:57.88 i 9 Mar 85		Bill Mckim	3:59.4 m 22 Jul 64	
Gareth Brown	3:59.5 m 25 Aug 84		Mick Mcleod	3:59.38 23 Aug 78	3:56.38 31 Aug 79
Jack Buckner	3:53.44 13 Jul 82	3:51.57 29 Aug 84	Dave McMeekin	3:59.7 m 30 Aug 75	3:58.05 30 Aug 76
Tom Buckner	3:58.87 5 Jun 93		Bob Maplestone	3:59.5 mi 19 Feb 72	3:58.5 m 25 May 73
Darius Burrows	3:59.91 5 Sep 98		Eamonn Martin	3:59.7 m 12 Jun 83	3:59.30 23 Aug 83
Neil Caddy	3:59.6 m 6 Aug 95	3:55.84 25 Aug 96	Ron Martin	3:58.9 m 11 May 74	
Sean Cahill	3:56.95 31 Aug 79		Steve Martin	3:56.71 10 Jun 84	3:56.36 5 Aug 86
Adrian Callan	3:59.45 23 Jul 85	3:58.28 13 Jul 86	Chris Mason	3:59.9 m 30 May 70	
Andy Carter	3:59.3 m 10 Jun 72		Tom Mayo	3:55.57 22 Jul 01	
Chris Chataway	3:59.8 m 28 May 55		John Mayoock	3:56.90 15 Sep 91	3:50.32 5 Jul 96
Pat Chesters	3:59.60 20 Jul 85		Craig Mochrie	3:59.6 m 28 Aug 89	
Dave Clarke	3:56.95 17 Jul 82		Dave Moorcoft	3:29.9 m 26 Jul 75	3:49.34 26 Jun 82
Frank Clement	3:57.44 10 Aug 74	3:54.2 m 27 Jun 78	Tony Morrell	3:58.5 m 9 Sep 88	3:51.31 14 Jul 90
Sebastian Coe	3:58.35 30 Aug 76	3:47.33 28 Aug 81	Norman Morrison	3:58.7 m 31 May 71	
Steve Crab	3:54.36 21 Jul 84	3:51.76 14 Aug 87	Alan Mottershead	3:58.8 m 12 Sep 77	3:58.23 14 Sep 79
Steve Cram	3:57.42 2 Jul 78	3:46.32 27 Jul 85	Simon Mugglestone	3:58.9 m 19 May 90	
Alistair Currie	3:59.29 2 Aug 85		Ciaran Murphy	3:58.68 24 Jun 95	
Paul Davies-Hale	3:56.5m 20 Aug 89		Ken Newton	3:59.8 m 12 Sep 77	
Billy Dee	3:59.17 14 Jul 93		John Nuttall	3:58.83 14 Aug 91	
Rob Denmark	3:59.7 m 2 Jul 89	3:55.38 12 Aug 90	Mike Openshaw	3:57.2 m 29 May 98	
Jim Douglas	3:58.5 m 23 Jul 69	3:56.0 m 10 Jun 72	Steve Overt	3:59.4 m 17 Jul 74	3:48.40 26 Aug 81
Mike Downes	3:56.47 31 Aug 79	3:56.04 25 Aug 82	Neil Ovington	3:57.07 11 Jul 86	
Neill Duggan	3:59.1 m 4 Jun 66	3:56.1 m 11 Jun 66	Adrian Passey	3:58.39 18 Jul 86	
Jason Dullforce	3:58.42 i 14 Mar 92		Ken Penney	3:59.90 4 Jul 91	
Joe Dumbar	3:59.9 m 18 Sep 91		Gordon Pirie	3:59.9 m 23 Sep 60	
Mal Edwards	3:57.8 m 20 Sep 87		Malcolm Plant	3:59.61 31 Aug 79	
Michael East	3:59.61 22 Jul 01		Tim Redman	3:59.3 m 16 Jun 85	
Peter Elliott	3:58.54 28 Jan 84	3:49.20 2 Jul 88	Ben Reese	3:59.82 I 14 Feb 97	
Steve Emson	3:58.9 m 31 Jul 79	3:58.62 31 Aug 79	Colin Reitz	3:55.41 31 Jul 82	
James Espir	3:57.91 14 Sep 79	3:56.7 m 15 Aug 81	Jon Richards	3:59.94 7 Jul 87	
John Evans	3:59.97 i 26 Jan 91		Colin Ridding	3:57.42 5 Jul 88	
Graeme Fell	3:57.5 m 1 Jun 83		John Robson	3:58.81 29 Aug 77	3:52.44 11 Aug 81
Simone Fairbrother	3:59.5 m 20 Aug 89	3:56.83 17 Aug 90	Nick Rose	3:58.4 m 25 Jul 73	3:57.49 8 Aug 80
Steve Flint	3:58.68 26 May 80		Ray Roseman	3:59.8 m 23 Jul 69	
Brendan Foster	3:58.5 m 31 May 71	3:55.9 m 10 Jun 72	Mark Rowland	3:55.72 11 Jul 86	3:52.99 10 Sep 86
Andrew Geddes	3:59.28 7 Jul 87		Allan Rushmer	3:58.7 m 26 Aug 67	
Ian Gillespie	3:58.64 5 Jun 93	3:57.6 m 16 Jun 98	Alan Salter	3:58.31 9 Jun 82	3:56.99 9 Jul 85
John Gladwin	3:54.52 12 Sep 86	3:51.02 19 Aug 87	Mark Scruton	3:58.95 10 Jun 84	
Allen Graffin	3:59.86 5 Aug 00		Tony Settle	3:59.4 m 30 Aug 75	3:58.8 m 29 May 76
Andy Graffin	3:29.64 21 Aug 99	3:58.42 20 Aug 01	David Sharpe	3:59.02 27 May 90	
Derek Graham	3:59.40 13 Aug 66	3:59.24 20 Aug 66	Alan Simpson	3:56.6 m 7 Jun 65	3:55.68 30 Aug 65
Glen Grant	3:59.47 30 May 76	3:59.16 19 Jun 76	Chris Sly	3:59.69 8 Jul 79	3:58.85 8 Aug 80
Andy Green	3:59.2 m 25 Aug 64	3:57.74 3 Jul 65	Ray Smedley	3:59.0 m 15 Sep 72	3:57.7 m 27 Apr 80
Steve Green	3:59.6 mi 4 Mar 94		Barry Smith	3:58.96 4 Jul 75	3:57.46 8 Aug 80
Roger Hackney	3:58.77 13 Jul 86		Geoff Smith	3:55.8 m 15 Aug 81	
Steve Halliday	3:59.4 m 17 Aug 88	3:57.43 28 Aug 89	Ron Spiers	3:56.9 30 Apr 77	
Ian Hamer	3:59.9 m 16 Jul 88	3:56.19 5 Jul 91	Laurie Spence	3:58.8 m 12 Sep 77	
Tony Harris	3:58.96 3 Jul 65		Gary Staines	3:59.56 20 Jul 85	3:53.82 12 Aug 90
Rob Harrison	3:56.76 10 Jun 84	3:53.85 15 Jul 86	Graeme Stewart	3:59.55 25 Aug 96	
David Heath	3:59.36 17 Jul 89		Ian Stewart (1)	3:57.3 m 11 Jun 69	
Brian Hewson	3:59.8 m 28 May 55	3:58.9 m 3 Sep 58	Ian Stewart (2)	3:58.94 26 May 80	3:53.20 25 Aug 82
Nick Hopkins	3:59.4 m 15 Jun 90		Peter Stewart	3:58.7 m 11 Jun 69	3:55.3 m 10 Jun 72
Neil Horsfield	3:54.39 8 Jul 86		David Strang	3:59.40 i 22 Feb 92	3:54.30 22 Jul 94
Mark Howard	3:59.3 m 2 Jul 89		Gary Taylor	3:58.26 i 17 Jan 86	3:57.15 5 Jul 88
Colin Hume	3:59.58 i 5 Mar 83		Stan Taylor	3:58.01 18 Aug 62	
Tim Hutchings	3:57.83 2 Jul 78	3:54.53 31 Jul 82	Phil Tulba	3:59.7 m 19 Aug 98	
Derek Ibbotson	3:59.4 m 6 Aug 56	3:57.2 m 19 Jul 57	Bruce Tulloh	3:59.3 m 27 Jan 62	
Steve James	3:59.8 m 9 Jun 87		Geoff Turnbull	3:59.41 12 Jun 83	3:57.66 18 Jul 86
Mike Kearns	3:57.86 26 Jun 77		Adrian Weatherhead	3:58.5 m 19 Jun 71	3:57.59 29 Aug 75
Andy Keith	3:58.79 i 25 Jan 92	3:56.29 i 22 Jan 94	John Whetton	3:58.95 3 Aug 64	3:57.68 3 Jul 65
John Keyworth	3:59.43 14 Jul 84		Anthony Whiteman	3:59.44 15 Oct 95	3:51.90 16 Jul 98
Mark Kirk	3:59.67 3 Jul 86		Mike Wiggs	3:59.5 m 12 Jun 65	3:57.5 m 5 Jul 65
John Kirkbride	3:58.0 m 23 Jul 69	3:56.5 m 10 Jun 72	John Wild	3:59.79 1 Apr 95	
Paul Larkins	3:59.52 i 8 Feb 86	3:56.65 17 Jul 87	Walter Wilkinson	3:59.9 m 21 Jul 65	3:56.6 m 31 May 71
Ashworth Laukam	3:59.1 m 16 Jun 85		Graham Williamson	3:56.40 2 Jul 78	3:50.64 13 Jul 82
Paul Lawther	3:58.49 19 Jun 76	3:57.81 13 Jul 83	Davey Wilson	3:59.9 m 30 May 91	
Tony Leonard	3:59.92 8 Jul 79		Ken Wood	3:59.3 m 19 Jul 57	
David Lewis	3:59.6 m 27 Jul 82	3:55.96 23 Aug 83	Matt Yates	3:59.7 m 6 Sep 89	3:52.75 10 Jul 93
			Roy Young	3:59.4 m 14 Jul 71	



Tactics and Strategy

Synopsis – Lydiard says tactics are dying. Elliott believed only in running flat out all the way. GB bottom of the miling league in 1962. GB runners tactic of three laps slow and a fast last lap exposed by Igloi's athletes. The BMC started paced races with a draw for pace. The percentage improvement in the mile doubled from 1963 to 1969. The slow zones of the 800 and 1500 metres which have to be conquered by tactical training. Even the experienced break elementary tactical rules. What statistics say about the number of specialist races to peak. Making a declaration of intent.

STRATEGY AND TACTICS

Arthur Lydiard, the noted New Zealand coach, said 20 years ago, "The days of tactics are fast disappearing." On the same subject, Herb Elliott of Australia, only one of two men who broke a world record when winning an Olympic gold medal in the 1500 metres (The other was Jack Lovelock, New Zealand, in the 1936 Berlin Olympics). Stated, "The only tactics I admire are do-or-die."

What did Lydiard infer from his observation? One possible answer is that most world-class runners know that strengths and weaknesses of each other and are not likely to get caught out by obvious tactics. For example, a runner with a best time of 3mins 40secs/1500 metres, but has a time of 1min 42secs/800 metres and a time of 45secs/400m will obviously want a slow run race in order to use his "kick". He may go in to the lead and gradually slow the race down. Some may fall for this trick for a couple of laps, but if most of the field have times of sub 3mins 35secs/1500 metres, they will certainly make the third 400 metres unpleasantly fast for the noted kicker. This suggests that in order to stand a chance of winning a world class event, most of the athletes will require times of 3mins 32secs minus for the 1500 metres.

Just before the B.M.C was formed in 1963, a whole year had passed when not a single Briton had run a sub 4-minute mile. We were, in fact, bottom of the miling league in Europe, let alone in the world. Race after race saw a three-lap jog and then a stampee over the last 400 metres. Numerous letters of criticism appeared in ATHLETICS WEEKLY about the gutless running of our miling fraternity. One letter of note, supported the three-lap jog and sprinting the last 400 metres, the writer added, "When the time arrives our milers will give a good account of themselves in a fast run race . . ." We did not have to wait long to see if his words were to be substantiated. Igloi, the Hungarian coach attached to the Los Angeles Track Club, sent over three of his black-vested athletes to compete in a major mile race. Little did our domestic runners realise that they ran as a team, one man ensuring a sub 60secs first lap, the second man ensuring a sub 3-minute three-quarters of a mile. This was a great shock to the British top trio participating, so much so, that one of them dropped out just past the completion of the first lap. However, one British runner, split the American trio, coming third and breaking the sub 4 barrier. Apparently, he had dreamt the night before the race that he would run a 3mins 58secs mile. He did just that. This race exemplified the need for our athletes to get accustomed to Elliott's edict of total commitment or "die" in the

process. His view was that after several such deaths the body became immune to its occurrence.

So, the B.M.C. was formed with the primary object of getting our members used to world-class pace in a mile event. In the absence of a volunteer pace-maker, the field in a B.M.C. race were issued with folded pieces of paper which they picked from a hat. Three numbers were written at random on the scraps of paper. The athlete who drew No. 2, meant that the runner must reach 880yds in 2-minutes minus. The athlete who drew the paper marked No. 3, had the arduous task of getting to the three-quarters of a mile mark in 30-minutes minus. Those who drew pace making duties in one race were excluded from the draw in a subsequent race. This meant the athletes experienced leading in races, and later, being led. They became experienced racers. The N.U.T.S. reported that the percentage of improvement annually in the mile, doubled from 1963 to 1969, as a result of B.M.C. races. We were beginning to make an impact.

An interesting article appeared in RUNNER'S WORLD in 1982, which asked the question – WHY ARE THE BRITISH THE GREATEST MIDDLE-DISTANCE RUNNERS IN THE WORLD. Certain British coaches were asked their views. One stated that our cross-county tradition was at the heart of our success. Another felt that the mile was a particularly British event, like the British Navy ruling the seas! But, John Whetton, the surprise winner of the European Championships 1500 metres in Athens in 1970, had little doubt as the reason. "The current success of British middle-distance running is entirely due to the establishment of the British Milers' Club which created a new and zealous approach to training and racing". John Whetton was a B.M.C. member, now a Vice President of the Club.

One of the problems with the current Grand Prix series of races is that a "hare" is provided for all the races. There is a scientific reason why such pacemakers provide fast times. The air-resistance to the following runner is considerably reduced. This has been measured in research studies. Times achieved have enabled numerous athletes to obtain qualifying times to major events. The drawback is the athletes do not experience leading in a race on their own, which they may find occurring in major races. Their racing is one dimensional. There are two possible answers to this problem: 1) Bring back the draw system of pace making. 2) Keep the current method, but emphasise that the place to experiment with leading and other methods of racing is in the county, area and

national championships, plus graded meetings. A mile-mad professor at Oxford University, 30 years ago, asked the question: What is the best way to run a mile to win and record a good time? He fed all the available data on how world mile records were achieved into his computer, and came up with this formula: RUN EACH LAP FASTER. An interesting concept, for this is nearly level-pace running. Level-pace running is not level effort, it is INCREASED effort. When Jim Ryun was holder of the world mile record, he was in a head to head battle with Marty Liquori. It was a clash of the domestic Titans. Liquori led from the gun as follows: 1st lap – 60secs. 2nd lap – 59secs. 3rd lap – 58secs. 4th lap – 57secs. Liquori won by a foot.

There are two traditional slow zones in middle distance races (800/1500). The third 200 metres in the 800 metres. The third 400 metres in the 1500 metres. Now, the ability to increase speed in these zones and not die is a powerful weapon. If we have not rehearsed it in training many times, it is unlikely that we can execute it successfully in a race. There are three ways to overcome third lap lethargy: -

- 1) Train regularly at 1500 metres speed in excess of 800 metres, Eg. 4 x 1k with 500m jog in 3mins 45secs.
- 2) Run 800 metres at your best 1500 metres speed and then ACCELERATE to 900 metres x 4 with 3mins recovery jog. Each Month, extend the acceleration zone by 100 metres to 1300 metres. Good recovery after each rep.
- 3) A 2k acceleration run, eg. 1st lap – 80secs. 2nd lap – 76secs 3rd lap – 72 secs. 4th lap – 68secs. 5th lap – 64secs. When this can be achieved comfortably, move down one lap speed i.e. 76-72-68-64-60-56. This signals can be given by whistle blast every 100 metres.

In the last example this would be 19secs/100m– 1st lap. 18secs/100m – 2nd lap. 17secs/100m – 3rd lap, etc.

The same procedure for stiffening up the third 200 metres of an 800 metres race applies. Do not confine reps. at 800 metres target pace to just 400 metres. A session of 4 x 400 at target 800m speed is a good workout to get the feel of race pace. The recovery is 400m jog in 3mins. The reps can be gradually extended to 600 metres, with a pro rata increase in recovery time. Tom Courtney, 1956 Olympic victor, who ran sub 1:46/800 regularly, was keen one a weekly 3-lapper which went like this: - 1st lap – 60secs. 2nd lap – 56secs. 3rd lap – 52secs.

He averaged 30 miles a week!



The most elementary racing tactics are frequently ignored by experienced athletes.

These include:

- 1) Overtaking on a bend.
- 2) Failure to resist being overtaken on a bend
- 3) Running directly behind the leader in the closing stages and getting boxed in.
- 4) Running in the second and third lanes throughout a race.
- 5) Constantly looking over one's shoulders when in the lead, thus displaying one's anxiety at being there!
- 6) When running to a time schedule, failure to recognise quickly that it's too fast or too slow and reacting accordingly.
- 7) Whether the first 100 metres is run fast or slow, the oxygen utilisation is the same, so one might as well run it fast to get into a good position (Ref. Margaria).

A little statistic of note is that in two-thirds of Olympic 800 metre finals, the eventual winner took the lead in the last 100 metres. This strongly suggests level-pace running.

Tactics are concerned about how one executes a race. Strategy is about planning a season. There are three types of race to consider: -

- 1) Over-distance to bolster one's endurance

efficiency.

- 2) Under-distance to boost one's speed ability.
- 3) One's specialist distances where (1) and (2) are fully exploited.

The sequence for a 1500 metres runner might be as follows: -

April	3k race.	800 metres & 1500 metres
May	5k race.	800 metres & 1500 metres x 2
June		800 metres and 1500 metres
July		800 metres and 1500 metres x 2
August		800 metres and 1500 metres x 2

The sequence for the 800 metres might follow this plan: -

April	1500m	400m	800m
May	1,000m	400m	800m
June	400m	800m x 2	
July	400m	800m x 2	
August	400m	800m x 2	

A survey by the B.M.C. 25 years ago, revealed that ON AVERAGE an athlete peaked in the 800 and 1500 metres between the FIFTH AND SEVENTH race of the season at his/her specialist distance. If these number of specialist distances are rattled off in April and May, it's unlikely that the athlete will still perform at maximum during June and July. A

cautionary note here is that each athlete is an experiment of one. One athlete may discover from his/her racing diary for the past two years, that the best performance was achieved in the tenth 800 metres or 1500 metres, and it occurred in a major championship. So be it.

It is suggested that there is not reduction in the weekly training load for over and under distance races, but a reduction of one-third of the normal training load before specialist races, with emphasis on race pace target. Research into tapering for races confirms this procedure.

We can sum up on a few points raised in this article: -

- 1) Start the season with a declaration of intent – a target. The target should be challenging and reasonable. Not much point talking about a sub 4-minute mile, if one hasn't cracked 4-minutes for 1500 metres yet! Write down the target on a piece of paper and put it up in a prominent place so that you are constantly reminded of it. This is what Phil Banning, the current national Coach for Wales did in 1971. he wrote, "Sub 4 this year – YES!" He stuck the notice on his shaving mirror. He did it. By the way, simply saying, "I must want to improve." Is not a target, it's a prayer!
- 2) Decide how you are going to achieve your target. You need to decide how much time daily you can devote to training. If your aim is to break 2-minutes for 800 metres, you need to do 200 metre reps in 29secs, 400 metre reps in 59secs and 600 metre reps in sub 90secs. Start with adequate recovery times and gradually reduce them as you become more proficient. Your over-distance work will be at 1500 metres speed, around 65secs per 400m, start with 800s ion 2:10. A good 400 metres time is essential for two-lap success. Short and long sprints should be used. From blocks, 60m reps. The real work in a 400 metres race starts after 300 metres. A good session is 1 x 350, 2 x 300, 4 x 250, with good rest and reduced gradually.
- 3) Plan your sequence of races.
- 4) Have a basic plan when your race. The simplest is to run level pace to obtain your target and ignore the rest of the field. Breaking 4-minutes for 1500 metres requires three laps of 64secs each and a sizzling last 300 metres.
- 5) Tactical training pays off. Mal Whitfield (USA), spent six months before the 1948 and 1952 Olympics, learning to accelerate from 400 to 600 metres in an 800 metres race. He won two gold medals, beating others with superior 400 metre times than his.
- 6) Remember the simple rules of racing – overtake fast before bends, don't get boxed in over the final dash for the tape.
- 7) Personal best times are achieved by courageous running, you venture into uncharted territory, the occasional gamble is worth a try.
- 8) Run in all B.M.C. organised races you can. The Grand Prix series are not the only races the B.M.C. organises, great times are



Cardiff, 4.7.01. HAYLEY YELLING leads from CATHERINE BERRY. photo by Mark Shearman



Track Stats - Summarised by Roger Roth from Mirko Jalava's World List

MEN'S 800m 2001

Country	Top 100	Highest
Kenya	26	1
United States	11	18
Russia	6	1
South Africa	6	8
Germany	6	30
Spain	5	50
Netherlands	4	10
Morocco	4	35
France	3	26
Canada	3	56

27 countries represented

100th = 1:47.04

WOMEN'S 800m 2001

Country	Top 100	Highest
Russia	20	4
Ukraine	8	22
China	7	35
United States	6	15
Germany	5	11
Spain	5	21
Jamaica	3	18
Belarus	3	24

40 countries represented

100th = 2:03.06

An unusually wide distribution in the women's 800 m, with many more countries placing two or one athletes in the top 100 than in other events. The widest distribution I've observed in any event thus far was that of the 1999 men's long jump, with 44 countries represented in the top 100.

MEN'S 1500m 2001

Country	Top 100	Highest
Kenya	27	2
United States	11	23
France	10	11
Spain	8	7
Morocco	7	1
Great Britain	6	34
Algeria	4	4
Germany	4	70
Ireland	3	42

22 countries represented

100th = 3:39.06

This time, an unusually narrow distribution in the men's event, but not so narrow as that in the women's marathon, where there were only 18 countries represented.

WOMEN'S 1500m 2001

Country	Top 100	Highest
Russia	14	2
China	12	40
United States	10	4
Romania	5	4
Great Britain	5	14
Kenya	4	10
Germany	4	18
Ukraine	4	25
Ireland	4	37
Turkey	4	37
Ethiopia	3	27
Spain	3	32
Australia	3	60

33 countries represented

100th = 4:12.23

YOU CAN RUN A SUB 4-MINUTE MILE

The first 17 year old to run sub 4, was Jim Ryun. He went on to break the world record, even though he suffered from asthma. Statistically, the most likely age to do this is at 22 years. Overt did it when 19, Coe when 20. Gordon Pirie was 30 years old when he ducked under. Only one man has done it over the age of 40, and that was indoors.

What are the signs that this is on the cards? Well, a 3:41/1500m time might see you scrape under. But, the 800 metres time is significant as well. The minimum requirement is 1min.52secs. Most sub 4 men have times of 7mins.50secs for 3k. The writer has coached several sub 4-minute milers. Make no mistake about it, their achievement was 90% down to their efforts and 10% to the coach. Not vice versa!

Here is a sample of the training they did for 12 weeks before breaking the barrier:-

Day 1 - 3k pace - 4 x 1500 metres in 4mins with 3mins. Rest.

Day3 - Mile pace - 4 x 800 in 1min 58secs with 3mins rest.

Day 5 - 800 pace - 4 x 400 in 55secs with 3mins rest.

Day 7 - 5k pace - 3 x 1600 in 4 mins 28secs with 60secs rest.

Day 9 - Miles Pace - 1 x 1200 in 3mins, 2 x 600 in 90secs, 4 x 300 in 45secs. 4 1/2mins, 2mins.5secs, 60secs rest respectively.

Day 11 - 800 pace - 1 x 600 + x1 x 200, lap walk recovery, 1 x 500 + 1 x 300, lap walk, 2 x 400. 2mins, 1min 30secs and 1 min. Recovery respectively.

After each track session the following was done:- 20 m fast run up, 30 metres spring and 30m slow down. The spring zone was increased by 10 metres a time to 80 metres. That's six sprints.

On non track days, the athletes ran 5 miles in the morning and 10 miles at night. The actual times recorded by the athletes were:- 3mins56secs, 3:57.7, 3:54.5, 3:56 and 3:58.8. (Five athletes).

The repetition times listed above WERE NOT ACHIEVED until the cycle had been completed six times (36 training sessions). Give it a try and join the sub 4 - minute club. It's still a major achievement.

BMC Young Athletes Weekend, Ardingly College

57 athletes and 10 guest coaches attended the BMC Young Athletes training weekend at Ardingly College. The program included lectures on Lactic Acid Dynamics, and in depth look at the demands of the 800 metres and the 1500 metres. All athletes underwent a full battery of fitness tests to determine VO2 Max, basic sprint speed, flexibility and strength. Athletes benefited from quality training in an excellent atmosphere, working with leading B.M.C coaches. The stars of the course, winning awards for best male and female athlete were Eleanor Baker and Luke Stockton, aged only 12! The amount of enthusiasm and effort shown by the athletes was as usual, extremely high.

WINTER IN THE SUN?

Mark Harris who ran in B.M.C. races here in 1996/7, has started a New Zealand Milers Club. he has suggested that it may be possible for Brits to "lodge" with his members during their summer. News of this idea as it breaks.

ON-LINE ENTRY

Don't forget race entry can be made
on-line, see

www.britishmilersclub.com



DEFINING OUR TERMS

Wilf.Paish Dip P.E.(Carnegie)

I have been prompted to write this article because it is obvious our sport is confused over the meaning of words common to our sport's vocabulary. Quite wrongly, I thought that the passing of time, our sport education structure would have made sure that we use such words as "Strength" "Speed" "Stamina" etc. correctly since their true interpretation enables us to understand fully what the Sports' Scientists is trying to tell us. Reading an established newspaper, on the eve of this year's London marathon I am informed that Tulu has focused on "improving her strength and endurance". I wonder how much "absolute" strength is required to run just over 26 miles? Should the reference be one of "strength endurance"? Certainly not one and the same quality?

Perhaps in the terms used by the Concise Oxford Dictionary Tulu might have got stronger? However, its definition of "strength" isn't immediately obvious. I read - "Strength - being strong" - "Strong -

having strength". Although in addition there is reference to STRENGTH "having powers of resistance". Some forty years ago I found myself directing the "Study Group" as part of the Loughborough Summer School in athletics. Sports' Science was in its infancy. Those selected to attend the study group were all very well-qualified coaches, some even graduates in Physical Education. It became obvious that we needed to define some of our terms, so that our coaches all had a common understanding of what they were trying to develop when they made reference to the "S" factors.

The study group included two lecturers in Physical Education both of whom were responsible for initiating the only two degree status courses, of the time, at both Leeds and Birmingham. Hence we were able to arrive at some sound definitions for each of the "S" factors, together with the related components such as "power". The outcome was the representation of the three vital "S" factors with a triangle. At the time we thought the idea original. Perhaps it was since I cannot find any reference to it prior to this time? The apex of the triangle representing "SPEED" with the base angles representing STRENGTH and STAMINA. (see below)

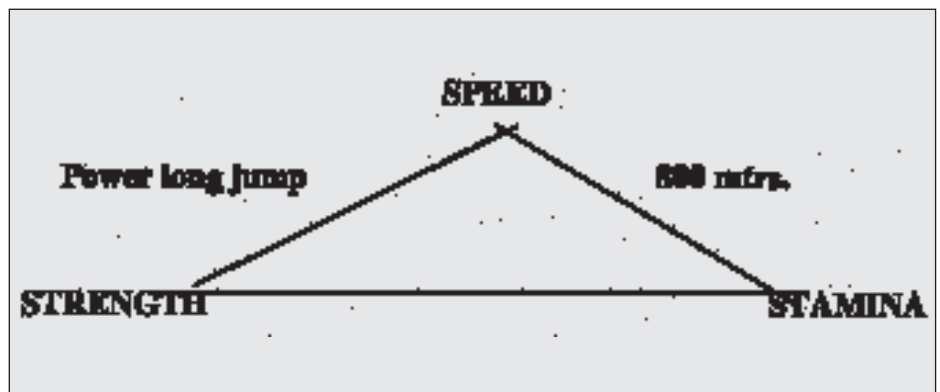
While we spent some considerable time arriving at a worded definition for such qualities as "STRENGTH" it became easier for coaches to understand when we used illustrations from sport. Hence, the ultimate position on the triangle for strength was the quality exhibited by the Olympic Heavyweight lifter breaking the Olympic record. A visual example to support our definition. The Ultimate for "STAMINA" was the "Comrades" marathon runner, with ultimate speed being represented by the Olympic one hundred metres champion. The 800 metres record holder being positioned

mid-way between Speed and Stamina on the representation and the Olympic Long Jump champion close to the midway point of the line joining speed and strength.

Those were early days and although the definitions now seem primitive they have, nevertheless, stood the test of time for coaches. However, modern research informs us that none of the three qualities happen to be good "bed-mates". They are NOT compatible with each other and that it is not possible to develop ultimate strength and speed at the same time. Likewise endurance training for the sprinter will have a negative effect upon speed. The evidence for this is certainly in our advanced texts for Physiology. To gain strength one needs to stimulate the hormonal feed-back loop by producing evidence in the body of degraded muscle protein which ultimately stimulates Growth Hormone (G.H.). If the intensity level of the exercise is not of a sufficiently high level to breakdown the muscle protein the adaptive mechanism will not be called into place. In speed work we need to make sure that all of those fast oxidative fibres in our muscles are stimulated to use energy quickly. Hence it is difficult from a physiological point of view to justify endurance training for any speed work. I have no answer for the sprinter who says his early morning aerobic session makes him feel good. Here we come into the psychology of recovery. Likewise we can improve speed over a given distance in running by examining the bio mechanics of the running action. For example the stride length and the effect which "POWER" training might have upon this. How do we improve the speed of the javelin throwers arm when it is already striking at about 90 m.p.h? That is speed, but it isn't certainly looks different. Hence, our understanding of the anabolic androgens will then appear very naive.



Wythenshawe, 23.5.01.
LOUISE WHITTAKER
photo Mark Shearman



Some Interesting Quotes

I couldn't touch my toes with straight legs, but I could break 4 minutes for the mile.

Roger Bannister

What's wrong with being strong?

Geoff Dyson (former Chief National A.A.A Coach)

What we ask athletes to do is quite simple, really.

Harry Wilson (Steve Ovett's Coach)

One-third of all running should be between 80 and 100 percent of our VO2 max (Half-marathon pace, 10k pace, 5k pace and 3k pace).

Frank Horwill

I hadn't a clue who I was racing against. All I knew was how I was going to race.

Herb Elliott (Olympic games gold medallist and world record at 1500m)

I spent twice as much time on my weakest events. We can all do plenty on our strongest events.

Daley Thompson.

A runner's success is 90 percent down to him/her, and 10 percent to the coach. Not vice versa

Frank Horwill.

I ran three-quarters of a mile weekly in 3-minutes. Going through in 3mins.05secs in a mile race was nothing to me.

Jack Lovelock (1936 1500m Olympic gold medallist and world-record).

If speed is the name of the game, never get far away from it.

Peter Coe.

The day after coming out of hospital, I could only walk 100 metres. Each consecutive day I walked a farther 100m. I notice things that escaped me before. I came home and wrote about them. This led me to write - A WALK IN DOCKLANDS a monthly column in a local magazine

Frank Horwill (After his second cancer operation).

A man wrote to me for advice. He said he was training to be an Elite National Coach. I told him that the only way to be able to call himself an Elite National Coach, was to train athletes to world-class.

Peter Coe.

Some advice I received 60 years ago was good. For endurance run 10 laps consecutively 10-seconds a lap slower than in your best mile. For speed, run two laps 4-seconds a lap faster than in your best mile. They forgot to tell me what to do in between.

Frank Horwill.

Why not train at several paces in one session? For instance: 1 x 2k at 5k pace, 1 x 1600 at 3k pace, 1 x 1200 at 1500m pace.

Derek Parker (Scotland)

I'm sick to death of hearing how Seb Coe trained

Unknown coach at a coaching conference.

I could run 47-seconds for 400 metres anytime of the year

Seb Coe.

If I was down to run 10 miles in training, it seemed pointless not to do it in 50 minutes

Seb Coe.

I wanted to scare the living daylights out of the opposition with my endurance –

Steve Ovett on reaching 148 miles a week in the winter before the 1980 Olympics. He didn't do as well as Coe, who got gold and silver to Ovett's gold and bronze.

I saw an athlete in Los Angeles do 3 x 1 mile in 4mins 08secs with 15 minutes' rest after each mile. What's the point of that? A 5k is 3 x 1 mile in 4mins 12secs with no rest after each mile.

Tim Hutchings in a letter to Frank Horwill (Hutchings ran 13:11 to place 4th in the Games).

I'm going to win

Gaston Roelants (Belg) to Ian Stewart before the International Cross-County in the late 1960s. He did win.

This Swiss guy finished last in a 1500 metres abroad. A week later at the Crystal palace he finished second to Steve 10-seconds faster than his previous race. I queried this with him. He replied, "Racing is like playing cards. Last week I had a bad hand. This week I had a good hand."

Harry Wilson.

Failure is a reason to try even harder

Frank Horwill.

A vet phoned me up, his first words were, "I want to break 4-minutes for the mile." I told him to break 4 minutes for 1500 metres first. He never did. This is an example of a Walter Mitty syndrome in many athletes. He wanted cream first, never mind drinking the milk.

Frank Horwill.



Cardiff, 4.7.01. RACHEL NEWCOMBE (161), MARIA LYNCH (Ireland, 160).
photograph by Mark Shearman.

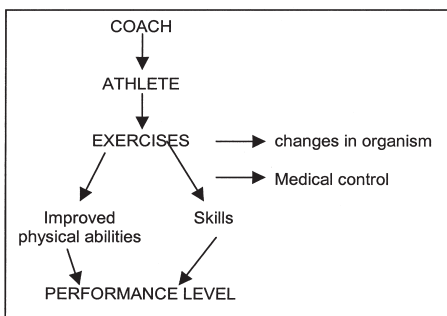


How to understand training

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).



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 sedentary 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.

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:

1. Each exercise will be performed in order to achieve a concrete objective in the form of a certain change in the organism.
1. 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

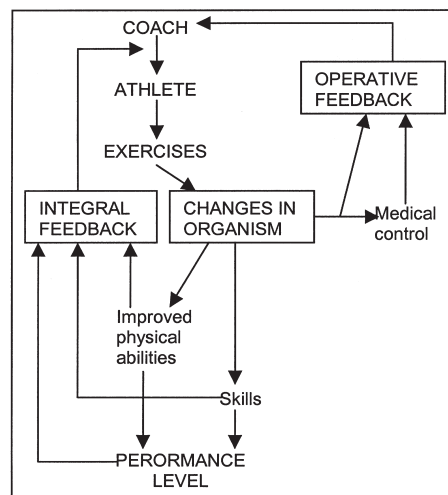


Figure 3

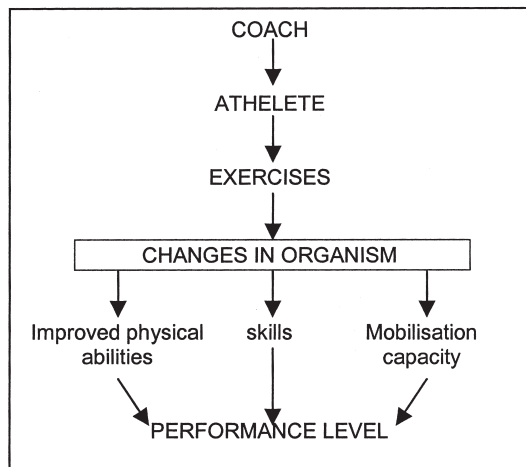


Figure 2

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:

1. To use the help of sport physicians and special laboratories.
1. 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.

The practical use of the scheme outlined above requires an understanding of what are the necessary changes to achieve. The aim of 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 distributed 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

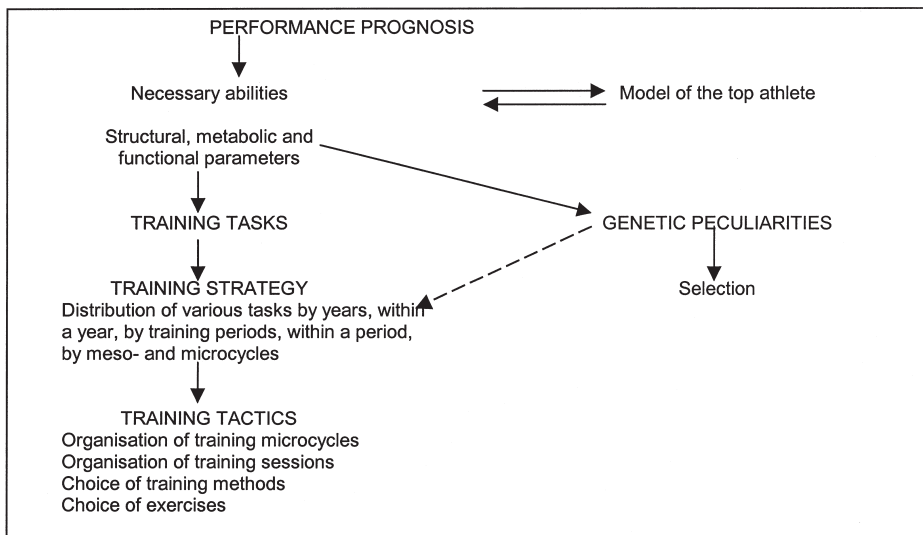


Figure 4

training methods and exercises.

The Rua Silva Schedule and Portuguese Training Methodology

- Some details
by
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In this article about Portuguese middle/long distance running method-ology, I will describe the fundamental aspects of the typical and traditional methods.

The training methodology has progressed and developed over the years, even if it preserves the same structural basis. This is what I will try to describe in detail.

However, I need to say that my opinions regarding Portuguese training, are no more than a personal point of view and that the information is unofficial.

I want to thank the British runner Andrew Renfree for helping me with the translation.

Portuguese runners - From nothing to success

Portugal is a small western European country with a population of approximately 10 million. Compared to other members of the European Community, it is not as economically well developed.

Performances in all track and field disciplines were nothing exceptional until the beginning of the 70's. No medals were gained at major European, World or Olympic competitions. Usually, mere participation in the first round heats was the best that could be hoped for. Here are the Portuguese records at the end of the 1960's.

800m 1:49/1500m 3:44/3000m 8:07/5000m 14:02/10000m
29:42/marathon 2:20

Here are the current marks in the same events:

800m 1:45,12/1500m 3:30,36/3000m 7:39,6/5000m
13:02,86/10000m 27:08,47/half 59:56/marathon 2:06:36

What progress! But this wasn't achieved by just a couple of talented runners. Many runners have been involved. To name a few:- Fernando Ribeiro=15 medals (6gold/6silver/3bronze), Rosa Mota 8 medals (5g/2s/3b), Carlos Lopes 7 medals (4g/3s/), Carla Sacramento 7 medals (2g/2s/3b), Paulo Guerra 6 (4g/1s/1b), Rui Silva 3 medals (1g/1s/1b), Aurora Cunha 4 medals (4g), Manuela Machado

5 medals (3g/2s), Albertina Dias (3 medals (1g/1s/1b), Conceicao Ferreira 3 medals (1g/1s/1b), Domingos Castro 2 medals (2s), Antonio Leitao 2 medals (2b). We have won 105 individual medals and 55 team medals in middle and distance races. We have held world records at 1500, 3000, 5000 in the junior age groups, and 10000, marathon and 20Km track in the senior age groups. We have won 4 world senior cross titles (3 men and 1 woman) and 4 European Cross titles. That's not bad for a small country!

In indoor and outdoor distance track competitions we have collectively won 9 gold medals, 10 silver and 8 bronze.

Why this success?

We need to go back to the early 70's. People began to think that we could do better than we had done because of the nature of the Portuguese people and our willingness to train hard. One of them was without doubt Mr. Moniz Pereira, our dean of coaches.

They began to analyse the other training schools, and the reasons behind the success of other countries at that time. We use to do only interval training and a low overall volume of work. However, we saw that others were doing things very differently. We can safely say that Lydiard greatly influenced Portuguese coaches through the introduction of his ideas centred around marathon training and a large overall volume of work. Successful Finnish athletes such as Vaatainen, Viren and Vasala demonstrated the effectiveness of Lydiard's methods. The father of long duration endurance training, Ernest Van Aacken, further developed our understanding of the need to move away from the pure interval training approach.

We then began to progressively increase the volume of our training until we were performing a high overall volume of continuous runs at relatively high intensities. Much of this work would now be considered AT training. We also continued with regular short and long repetition sessions. After making these changes success came rapidly. The same average runners progressed their performance levels, and some of them reach international level. The major lesson was that we need good volumes of easy/base training as well as the intervals that we had been performing in the 60's. More recently we have come to understand that simply performing hard and easy sessions is not the complete answer either. We have developed the concept of training at threshold levels for much of our specific work.

PART 1 - Some details on "The Portuguese School of Middle/Long Distance Training".

The methods described are those adopted by almost every Portuguese middle and long distance runner, male or female, from the elite down to regional standard athletes. The methods are adapted for competition from 1500m to the marathon, and on the track, road, or cross country. The article will describe the fundamental characteristics of the Portuguese training schedule. However, there is nothing particularly original about this method in terms of the actual sessions performed. The Portuguese method differs from others in the way the sessions are put together over the course of the year. The analogy of a chef can be used if its not the individual ingredients that count, what's more important is the way in which they are put together.

We need to say first of all that the Portuguese runner traditionally competes all year round and attempts to perform well in indoor and outdoor track competition as well as cross country and road races. There are obviously important points of the season which are more important than others, but generally the athletes attempt to remain in good competitive condition all year long.

In order to achieve this, the training is characterised by

consistency and stability. There are no great variations in weekly training from season to season or year to year. This is partly due to the necessity to earn a living and represent the athletic clubs in competition. It should also be noted that in Portugal it is rare to see an athlete race as 'preparation' for forthcoming competition. Each competition is seen as a serious event to be prepared for.

The basic structure of the Portuguese training system

In a typical week the Portuguese runners will perform two specific sessions on the track, and at least one continuous intensive run away from the track, type AT. When determining the pace of these sessions, the point of reference is the target race pace. This use of the target pace is preferred to isolate specific physiological variables (such as VO2 max, Lactate threshold etc).

THE TYPICAL WEEK

These sessions are done exclusively on the track to ensure precision of measurement. Except for poor weather conditions this allows for accurate analysis of changes in performance over time. Sophisticated techniques are not required, an improvement in the average time achieved for a set of repetitions indicates that competitive performance may also be expected to improve. Although basic, this technique has been found to be effective.

1. THE SHORT REPETITIONS

(interval training performed at faster than race pace)

This session is performed in midweek, usually Tuesday or Wednesday. The distances chosen are usually 200, 300, or 400m. However, the middle distance specialists eventually progress to even shorter distances (100 - 150m). The 800 and 1500m runners will run these at approximately race pace, while the 5000/10,000m runners will run at 1500 - 5000m pace and the marathon runners will run at 5 - 10,000m pace. This is seen as a classic interval session where the reps are run with incomplete recoveries. A typical session may be 15x400m with a recovery jog of 100m in 1 minute. These short repetitions are preceded by 30 minutes of easy running and 4-5 100m strides.

These short repetitions are performed year round, with no great variations in the number of repetitions or the recovery periods. However, there is a gradual increase in the pace of the running. Times are recorded accurately and the average for each session is calculated, the aim being to progressively improve the average time achieved. Each session always involves a given number of rep of the same distance. There is never any variation in distances within the session.

Although this is considered a hard session, the runners are careful not to go beyond their limits. These repetitions are not allowed to become the equivalent of a race situation. Again, the aim is for consistent improvement over long time periods.

2. THE LONG REPETITIONS

(Performed at race pace)

The second specific session is also performed on the track once a week, usually on a Saturday morning. The aim here is to run longer repetitions at the target race pace. In the week of a race this session is eliminated.

Again, the session begins with a 30 minute easy run away from the track and some faster strides before starting the real work. The repetitions performed are typically 2x3000m, 3x2000m, 4x1500m, 4-5x1200 or 4-6x1000m, with recoveries of 2-4 minutes. The exact



duration of the rest is not considered as important here as it is during the shorter sessions. The most important requirement of this session is that the repetitions are all performed at race pace, and the recoveries need to be sufficient to allow this.

3. CONTINUOUS RUNS (specific sessions at below race pace - AT work)

The rest of the training is made up of continuous runs throughout the week. The majority of these are easy recovery runs performed on various types of terrain including road, parkland, grass and beaches. On some occasions this base endurance work is transformed into a specific AT session. A group of runners will begin slowly (for the first 10-20 minutes) with base endurance running. The pace is then gradually increased to AT levels or even near to race pace at the end. This is only done if the runners are completely recovered from the other specific training. This work is not always planned, but some times occurs spontaneously as is reported to occur with the Kenyans.

PART 2 - The schedule of Rui Silva

Rui Silva attracted international media attention when he won the World Indoor 1500m gold medal in 2001, ahead of Olympic Champion Noah Ngeny of Kenya and Reyez Estevez of Spain. Recently Rui won the European Indoor 1500 gold medal and ran 3:35.24, the best indoor 1500 performance in 2002.

Last summer he won the 1500m at the Monaco Grand Prix meeting in 3:30.36 while preparing for the world championships in Edmonton. Afterwards he flew to Portugal, where the next day he won the National title in 3:34.

Unfortunately, when he arrived in Edmonton he contracted influenza and was confined to his bed with a 40° fever. His coach didn't want him to compete, but he decided to try anyway. He got out of bed just to compete. Despite these circumstances, he did 3:38 in the first round, and the next day 3:36 in the semi-finals. Two days later, after 2 demanding qualifiers, he was very tired in the Final and lost contact with the leaders before finishing 9th in 3:35.74.

RUI SILVA PROFILE

Rui Silva was born on the 03 August 1977 near Santarem, 50 miles north of Lisbon. He is 1.75m tall, and weighs 65kilos. He was a very quiet, shy person and his favourite chef was Ronald McDonald! He was born into a very humble family that didn't want him to leave school to begin a professional running career. They were afraid that he may not be able to make a living in this way.

He began racing at 14 years of age, winning some local road and cross country races in his age group. On the track he chose to compete at 1500 and 3000m. From the age of 14-18 he performed 6 training sessions a week. He competed 25 to 35 times a year, all year round. He became renowned for his ability to win on track, road and cross country by outkicking his opponents at the end. It seemed as though he had natural sprinting ability.

At 18 years of age he ran 3.40 for 1500m and was selected for the World Junior Championships although he achieved no great results when he got there. Later (1997) he moved from his hometown to Lisbon to train with his coach, Mr. Bernardo Manuel, and become a professional runner.

These are his current personal best performances:

	OUTDOOR	INDOOR
800m	1:46.40	1:46.20
1000m	2:16.30	2:17.36
1500m	3:30.36	3:34.98
Mile (1609m)	3:50.91	3:52.18
2000m	4:54.66	5:03.93
3000m		7:39.44

Progression at 1500m - 1994-3:50.09//1995-3:44.80//1996-3:40.09//1997-3:46.07//1998-3:34.00//1999-3:30.88//2000-3:30.46//2001-3:30.36

These are his championship medals:

- Gold 1500 European Indoor Champ -3:44.57 - Valencia 19.02.98
- Silver 1500 European Outdoor Champ - 3:41.84 - Budapest 20.08.98
- Silver 1500 World Track Cup - 3:40.95 - Joanesburg 12.09.98
- Gold - Champ - 3:44.29 - Gotemburg 30.07.99
- Silver 3000 European Indoor Champ - 7:49.70 - Gent 27.02.2000
- Gold 1500 - Indoor World Champ - 3:51.06 - Lisbon 10.03.2001
- Gold 1500 n Indoor European Champ - 3:49.93

THE TRAINING SCHEDULE OF RUI SILVA

The training schedule is based along the traditional Portuguese lines described previously. It basically consists of continuous endurance/base/recovery runs, AT runs, short duration repetitions (faster than race pace) and medium/long duration repetitions (race pace).

The periodisation is annual with two main cycles. The **Winter Cycle** which runs from October to March, and the **Summer Cycle** (from April to September). The first cycle target is a major indoor competition (World or European), and the main aim of the second cycle is a major outdoor championship (Olympics, World or European).

At almost every phase of the process he participates in

serious competitions. During the winter period this involves some cross country and road races. In the last two years he has been selected for the World cross country championships after winning the Portuguese short course title. A week after becoming World Indoor 1500m champion he competed in the Lisbon half marathon and achieved 1:06. Later, in May, his home town payed tribute to their World Indoor Champion by organising an 8.5 km road race. Rui decided to enter and eventually won the race, defeating some good Portuguese road runners and some Kenyans who were there!

Recently, when Rui reach this winter season cycle peak point, the European Indoor Camp, he did 11 races in 37 days! This includes a 12Km road race, and important cross country national and international races.

ANNUAL PERIODISATION

The annual periodisation begins with a general conditioning period throughout September and October following the demanding season. He has a week of rest, then a week of training on alternate days, before performing daily continuous running in the third and fourth weeks. These runs are performed on a variety of surfaces including the beach and mountain trails. He may also perform easy fartlek sessions. The total volume of training during these first 3 weeks of running is 420Km.

Following this initial conditioning period, each of the two cycles (winter and summer) are divided into 3 phases (lets call them Phase 1, 2, and 3). The aim is to improve condition through specific sessions and competitions so that peak form is achieved at the time of the major events. The training moves from general to more specific work. Basically, phase 1 is aimed at general condition, phase 2 is pre-competition when the training becomes more specific, and during phase 3 the training attempts to continue progressing fitness at the time of the main competitions.

These are the volumes of work performed during each of the periods:

Winter Cycle: Phase 1 - 6-8 weeks duration. 130Km/week average (80 miles)

Winter Cycle: Phase 2 - 3-4 weeks duration.

110-120Km/week average (68-75 miles)

Winter Cycle: Phase 3 - 4-6 weeks duration. 80Km/week average (50 miles)

Summer Cycle: Phase 1 - 6-8 weeks duration total.

115-120Km/week average (71-75miles)

Summer Cycle: Phase 2 - 3-4 weeks duration.

112Km/week average (69 miles)

Summer Cycle: Phase 3 - 8-10 weeks duration.

100-120Km/week average (62-75 miles)

There are no great variations in training volume throughout the yearly cycle, just a small reduction prior to the peak competition periods. What does change is the intensity of the sessions. Phases 2 and 3 involve faster paces during training, although Rui Silva does not perform a great deal of specific work

in the 8-10 days prior to a major competition. He usually performs a total of 13 training sessions each week.

Away from the specific sessions the majority of the training is mixed running at various intensities.

1. Slow continuous recovery runs. These are performed on all kinds of terrain, from road to cross country and parkland. Once a week he runs on the beach.
2. Fast continuous runs away from the track (progressive AT continuous runs).
3. Slow continuous warmups and cool downs before and after specific sessions. This is something that all Portuguese runners consider important in developing stamina.

With regards to AT training, Rui performs a large amount for the 800/1500/3000 events. This is especially so during phase 1 and to a lesser extent during phase 2. However, during periods of frequent

competitions he performs a maximum of 1 AT session each week. This AT training is not scheduled in advance, but it comes naturally if he feels that he is sufficiently recovered to do it. This is the typical

Portuguese way to do it. However more advanced Portuguese coaches have begun to schedule AT work as a specific session. This does not always involve a continuous run, but can also take the form of long repetitions.

He does flexibility work, but no plyometrics or weight training. The only strength work he does are repetitions on hills. Sometimes he runs steps as a form of strength training. His coach was a fan of the Lydiard methods which helps explain his preference for using hills. It can be said that the vast majority of Portuguese runners and coaches do not believe in the need for strength training. They think that sufficient strength is gained through resistance running such as hill work.

SPECIFIC TRAINING MEDIUM / LONG REPETITIONS

Specific training is scheduled for three days each week. One day of short repetitions, one of hill repetitions and one of long repetitions. In the case of Rui Silva these are done on Tuesday (short track reps.), Wednesday (hills) and Saturday (medium/long track reps.) mornings. In the evening following a specific session in the morning he will perform an easy 40 minute run.

The specific training sessions are performed in a methodical manner, always trying to progress while using the same

basic sets of repetitions.

Below are some actual examples of training sessions performed by Rui Silva during 1997, 1998, and 1999.

Note that the sessions are nearly always the same in terms of the number and distances of the repetitions. He works with repetition sessions of 3000m, 2000m, 1500m, and 1000m in this order on successive weeks.

MEDIUM/LONG REPETITIONS

@ = time pause	1997	1998	1999
3000 m	November.14 2x3000m @3m (8:59.2+8:42.0)	October.31 2x3000m @3m (8:34.9+8:23.9)	October.23 2x3000m @3m (8:28.5+8:29.5+8:06.4)
2000 m	November.22 3x2000m @4m (5:51.3+5:47.9+5:47.6)	November.07 3x2000m @3m (5:36.2+5:31.0+5:25.1)	October.30 4x2000m @3m (5:40.6+5:36.8+5:44.3+5:35.0)
1500 m	November.29 4x1500m @4m (4:16.3+4:09.2+4:06.5+4:13.2)	November.14 4x1500m @3m (4:07.4+4:03.9+4:04.2+3:59.8)	November.06 5x1500m @3m on a grass track
1000 m	December.13 6x1000m @3m (2:50.4+2:47.3+2:42.5+2:43.2+2:37.1+2:42.5)	November.21 6x1000m @3m (2:48.3+2:42.5+2:38.8+2:40.0+2:36.5+2:48.0)	November.27 6x1000m @3m (2:46.4+2:42.5+2:42.1+2:37.6+2:37.5+2:30.1)

You will notice that these sessions are performed during the winter cycle. As Rui has gained in maturity and experience, the tendency has been to increase the number of repetitions while decreasing the recovery interval. It may be surprising that he never performs these long repetition sessions with a recovery period of less than 3 minutes. However, the first priority on these long sessions is the pace achieved, with the length of the recovery period being of secondary importance. Sometimes he allows almost complete recovery between repetitions. This session is always performed following an easy 30 minute warm up run, and is followed with a 15 minute warm down run.

He usually performs 3-5 fast strides over 100m before starting the repetitions. It is interesting that a 1500m runner such as Rui performs these long 1000 - 3000m repetitions regularly throughout the year. However, this work has been fundamental in developing his overall fitness. I believe that it is this endurance work which allows him to be strong enough to produce such a good kick at the end of fast races.

As the season progresses, and prior to the competition period, he reduces the distance of his repetitions, but attempts to achieve the fastest possible average time over the course of the session.

Here are some examples of medium/long pace race sessions during the main competition period.

-3x(1000m+500m) @3m. total distance=4500m

(2:39.5+1:14.1+2:36.3+1:13.7+2:32.8+1:10.1)

On other occasion: -3x1000m+1X500m @3m. total

distance=3500m (2:35.7+2:33+2:32+1:09)

Two further sessions: 5x500m @3m. total distance=2500m

(1:12.0+1:11.5+1:10.1+1:10.1+1:09.7)

-5X400 @3m. total distance=2000m

SPECIFIC TRAINING - SHORT REPETITIONS

Below are some examples of the development of the short distance interval sessions. Again, he aims for progression by increasing the number of repetitions and reducing the recovery periods, while always aiming to improve the average times.

@ = time pause	1998	1999
400 metres	-10x400m @ 60 sec -15x400m @ 60 sec -12x400m @ 60 sec -12x400 @ 50 sec	-12x400 @ 50 sec -15x400 @ 50 sec -15x400 @ 50 sec -12x400 @ 50 sec -12x400 @ 50 sec
300 metres	-12x300m @ 60 sec	-12x300m @ 50 sec -15x300m @ 50 sec
200 metres	-12x200m @ 60 sec -12x200m @ 50 sec	-15x200m @ 60 sec -15x200m @ 50 sec

I have not indicated the average times achieved, as to some extent this is irrelevant. In a group of runners training together, each will be working to their own individual time schedule. However, in the case of Rui Silva, the 400's are close to 60 seconds, the 300's close to 43 seconds, and the 200's in 27-28 seconds. This is during phase 1 of the winter and summer seasons. During this phase it can be said that this session is almost performed as classical interval training. We say that the athletes are working at 'threshold' levels. It is a hard session, but the runners never push to the limits of their abilities.

During phases 2 and 3 the speed is increased, with a corresponding increase in the recovery periods and a decrease in the number of repetitions.

SPECIFIC TRAINING - HILL REPETITIONS

Rui performs hill training once a week during phase 1 of the winter and summer seasons. This is seen as a form of both speed and specific strength training. He performs very fast repetitions on a 100m or 200m hill with short recovery jogs back to the bottom. Again he aims for the maximum speed he can maintain over the course of the session. This session is also preceded by a 30-40 minute warm up run and followed with a 10-15 minute cool down.















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