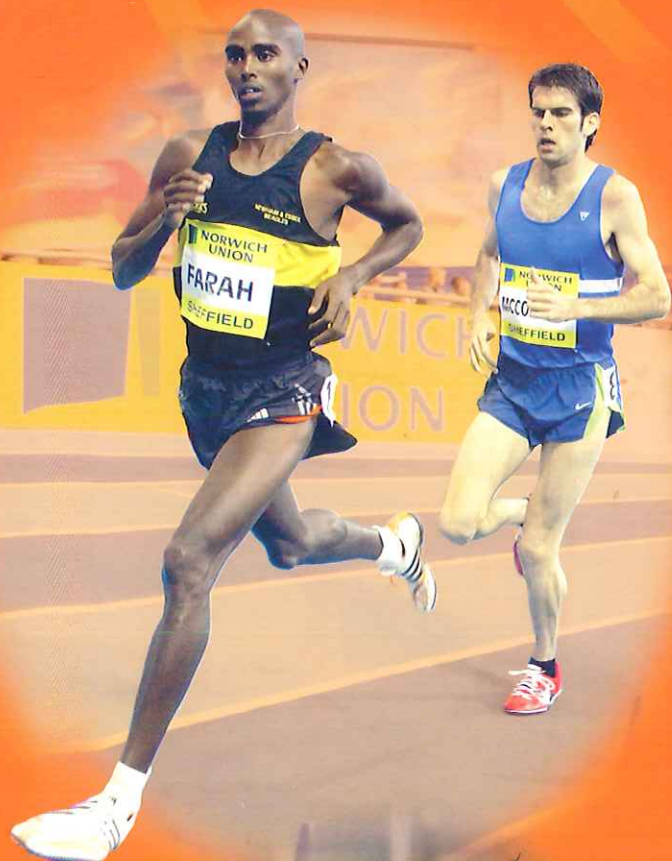


BMC News

Official Journal of the British Milers' Club

Volume 4 Issue 5 - Spring 2007



The British Milers' Club

Founded 1963

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All official correspondence to the BMC should be addressed to the National Secretary at the above address. All matters so received will be addressed by the national committee at their next meeting.

All other requests should be sent to the BMC Administrator Pat Fitzgerald and will be dealt with as soon as possible. Matters concerning specific areas of the club should be sent to the relevant person from the above list.

The BMC is always looking to expand its network of people and locations that host BMC races. If you feel that you can help or want to get involved then please contact the BMC Administrator Pat Fitzgerald.

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Cover photographs - Front

clockwise from top:

- Sheffield, 11.2.06 - MO FARAH leads from NICK McCORMICK in the 3km
- Birmingham, 17.2.07 - JO PAVEY (Gt. Britain) celebrates winning the 2 miles in a UK record time of 9 mins, 32 secs.
- Birmingham, 2.3.07 - JENNIFER MEADOWS
- Mombasa, 24.3.07 - CHARLOTTE PURDUE

By Mark Shearman

Cover photographs - Back

clockwise from top:

- Birmingham, 17.2.07 - RICHARD HILL wins the 800m.
- Sunderland, 10.3.07 - FRANK TICKNER wins the senior men's race.
- Sunderland, 10.3.07 - LIZ YELLING wins the senior women's race.
- Mombasa, 24.3.07 - FELICITY MILTON is helped by Dr NOEL POLLOCK at the end of the senior women's race.

By Mark Shearman

Printers

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From the pen of the Chairman

by Tim Brennan

These are my first notes as Chairman of the BMC. I have always been proud to be a BMC member and am greatly honoured to have been elected to the chairman's role. I also feel very lucky to be taking on the chairmanship when the club is in an extremely healthy state. The clubs membership is at a record level of over 1800 and we are enjoying great success with our academy training courses, our coach education days and our race programme.

A major contribution to the current success of the club has been the chairmanship of my predecessor Norman Poole. The Grand Prix, academy, and national education days are all initiatives that might be considered an essential part of endurance athletics today and all of them have started during Norman's period as chair.

As well as the change of chairmanship Steve Mosley has become vice-chairman taking over from Matthew Fraser Moat and David Reader has replaced Ollie Wright as secretary. It is again a mark of the health of the club that we have been able to make these changes in a planned way at a time when the club is strong, and with all the outgoing officers continuing to play an active role in the running of the club.

My own involvement with the club started in 1975 when I joined as a 13 year old young athlete to run in the races organised by Frank Horwill at Crystal Palace. In my first race I broke my 800m PB by 6.5 seconds and was sold on the benefits of BMC races! When you joined the BMC in those days you had declare on the membership form how you would improve British middle distance running. I have absolutely no idea what I wrote at the time but thinking about it today I believe the formula that was

provided by the BMC then of graded and paced competition, coach education, and bringing athletes together to train is equally applicable today. What has changed and has to be continually updated is our application of this formula. For instance In 1975 Britain was about to embark on it's most successful period ever in middle distance running and on the back of the success of Coe and Ovett a generation of British athletes were able to find places in the major European meetings at an early stage in their careers. Today these meetings are part of the IAAF Grand Prix and it is extremely difficult for even our top ranked runners to get races. The BMC must therefore step into the gap and provide races paced to World Class standards, and we must continue to try and improve the standard of these races.

Since the autumn edition of the BMC news the club has staged the National Coaching Symposium and National Event Specific day which attracted 130 and 80 people respectively. This strong interest shows the demand that exists for event specific coach education. Amongst the BMC committee and through our extended contacts we have people with proven experience of taking athletes from youngsters to international status. Through these coaching days that experience can be passed on to the benefit of both the coaches and their athletes. In a similar way to the competition side the BMC has updated its coach education to be relevant to today. In this case to provide practical event specific information that supplements the more generic coaching qualification schemes.

Our BMC academy under the chairmanship of David Lowes goes from strength to strength. We have staged courses at Ogmore, Cliff College, Irthlingborough and most recently Ardingly. We receive fantastic feedback

from those who attend the courses, and a mark of their success is the speed at which they completely sell out. Our academy members are also set to receive an extra benefit this year thanks to the generosity of our sponsors Nike. Each U20 member who joined the BMC in 2006 or earlier and who has paid their 2007 subs will receive a free pair of Nike Spikes. You can learn more about the academy's activities if you visit the recently revamped academy website.

At the time of writing these notes our first competition of the season has taken place at one of our regional meetings in Exeter and over 100 athletes competed in the series of 800m races. Our Grand Prix meetings naturally attract the most publicity, but the regional races are of great importance to the future. Without the events staged in the South West or in Northern Ireland there would be a marked lack of race opportunities forcing people to travel long distances.

UKA has also recently had a change of leadership. We have taken the opportunity of this change to have meetings with both the new chairman Ed Warner and the new CEO Nils De Vos. We gave them a clear view of the BMC's beliefs and aims and were greatly encouraged by their interest and open mindedness. UKA will be supporting the BMC in funding part of the cost of the coaching days and in financing top quality pacemakers in two of the five Grand Prix meetings. As part of our commitment to continual improvement the BMC will finance top pacemakers in the other three meetings as well as the prizes and other costs for all the meetings.

Finally I'd like to wish the best of luck to all of our members for the 2007 season.



REGIONAL & GOLD STANDARD FIXTURES 2007

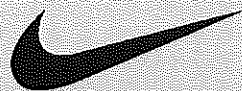
All entries should be made on our website www.britishmilersclub.com

ACADEMY RACES FOR YOUNG ATHLETES ARE INCLUDED IN REGIONAL RACES AT THE FOLLOWING VENUES:

ANTRIM, BIRMINGHAM UNIVERSITY, BRIGHTON, COVENTRY, ELTHAM, EXETER, JARROW, MARY PETERS, MIDDLESBOROUGH

DATE	Venue	Events	Contact	Telephone	Standard	
APRIL	24	Exeter	800 M & W All Ages	John Knowles	01872 263541	Regional
MAY	1	Trafford	800 M & W, 1500 M 8pm	Mike Harris	0161 437 9828	Gold Standard Only
	1	Mary Peters Track	800 M & W, 2 Mile Tri-lauf	John Glover	02890 287246	Regional
	12	Oxford	ROAD MILE M & W PRIZES FOR M & W	Pat Fitzgerald	01895 811822	See separate advert & website
	15	Trafford	800 M & W, 1500 M 8pm	Mike Harris	0161 437 9828	Gold Standard Only
	16	Mary Peters Track	3000 M & W	John Glover	02890 287246	Regional
	21	Jarrow	800 M & W All Ages	David Lowes	07930 318651	Regional
	23	Eltham	800, 1500, & 3000 M & W Various age group races	David Reader	020 8850 0853	Regional
	28	Birmingham Univ	800, 1500, & 3000 M & W All ages 2pm	Phil Hayes	02476 464010	Regional
	29	Trafford	800 M & W, 1500 M 8pm	Mike Harris	0161 437 9828	Gold Standard Only
	29	Exeter	1500 M & W All Ages	John Knowles	01872 263541	Regional
	30	Watford	800 M & W 7.45pm	Rupert Waters	07790 767433	Gold Standard Only
			1500 M & W	Phil O'Dell	01234 852038	Gold Standard Only
JUNE	4	Middlesborough	800 M & W All Ages	David Lowes	07930 318651	Regional
	6	Coventry	800, 1500, & 3000 M & W All ages	Phil Hayes	02476 464010	Regional
	11	Jarrow	800 M & W All Ages	David Lowes	07930 318651	Regional
	12	Trafford	800 M & W, 1500 M 8pm	Mike Harris	0161 437 9828	Gold Standard Only
	13	Watford	800 M & W 7.45pm	Rupert Waters	07790 767433	Gold Standard Only
			1500 M & W	Phil O'Dell	01234 852038	Gold Standard Only
	18	Middlesborough	800 M & W All Ages	David Lowes	07930 318651	Regional
	23	Antrim	1500, 3000S/C M & W	John Glover	02890 287246	Regional
	26	Exeter	800 M & W All Ages	John Knowles	01872 263541	Regional
	26	Trafford	800 M & W, 1500 M 8pm	Mike Harris	0161 437 9828	Gold Standard Only
	27	Eltham	800, 1500, & 5000 M & W Various age group races	David Reader	020 8850 0853	Regional
	27	Birmingham Univ	800, 1500, & 3000 M & W All ages 7pm	Phil Hayes	02476 464010	Regional
JULY	8	Mansfield	Mile M & W PRIZES	John Cooper	07751 662837	See separate advert & website
	10	Trafford	800 M & W, 1500 M 8pm	Mike Harris	0161 437 9828	Gold Standard Only
	11	Watford	800 M & W 7.45pm	Rupert Waters	07790 767433	Gold Standard Only
			1500 M & W	Phil O'Dell	01234 852038	Gold Standard Only
	16	Middlesborough	800 M & W All Ages	David Lowes	07930 318651	Regional
	18	Birmingham Univ	800, 1500, & 3000 M & W All ages 7pm	Phil Hayes	02476 464010	Regional
	18	Eltham	800, 1500, & 3000 M & W Various age group races	David Reader	020 8850 0853	Regional
	24	Trafford	800 M & W, 1500 M 8pm	Mike Harris	0161 437 9828	Gold Standard Only
	30	Jarrow	800 M & W All Ages	David Lowes	07930 318651	Regional
	31	Exeter	1500 M & W All Ages & 5000 Sen	John Knowles	01872 263541	Regional
AUGUST	7	Trafford	800 M & W, 1500 M 8pm	Mike Harris	0161 437 9828	Gold Standard Only
	8	Watford	800 M & W 7.45pm	Rupert Waters	07790 767433	Gold Standard Only
			1500 M & W	Phil O'Dell	01234 852038	Gold Standard Only
	14	Nottingham	Tim Weathall Mile M&W PRIZES	John Cooper	07751 662837	See separate advert & website
	15	Coventry	800, 1500 M & W All ages	Phil Hayes	02476 464010	Regional
	15	Brighton	800 M & W All ages, 5000 Men (Gold Standard sub 15.45)	Chris Carter	01273 503446	Regional
	16	Antrim	800 M & W All ages	John Glover	02890 287246	Regional
	21	Trafford	800 M & W, 1500 M 8pm	Mike Harris	0161 437 9828	Gold Standard Only
	22	Eltham	800, 1500, inc various age group races	David Reader	020 8850 0853	Regional
	28	Exeter	800 & 3000 M & W All Ages	John Knowles	01872 263541	Regional
SEPTEMBER	5	Watford	800 M & W 7.45pm	Rupert Waters	07790 767433	Gold Standard Only
			1500 M & W	Phil O'Dell	01234 852038	Gold Standard Only

Additional races may be arranged at other venues. Check website for details or contact your Regional Representative. Please enter by Friday before meeting to avoid disappointment.



BMC NATIONAL RACES 2007

See www.britishmilersclub.com for Entries, Timetables, Seedings, Results, Information

Entry Standards

Entry to Grand Prix will be guaranteed for paid up BMC members entering at least 7 days in advance of the meeting provided they have achieved the BMC Senior qualifying times.

MEN 800m – 1:56.0 & 1500m – 3:56.0

WOMEN 800m – 2:18.0 & 1500m – 4:45.0

Development races will be paced to allow athletes that have not done so, to achieve these qualifying standards.

El Standards

MEN 3000m – 8:30, 5000m – 14:50, 10K – 30:00

& 3K S/C – 9:20

WOMEN 3000m – 10:00, 5000m – 17:30, 10K – 34:40

& 3K S/C – 11:00

10,000 metres Trials

Entry to these races is by invitation based on the above entry standards. If invited enter on BMC website. More details from Ian Hodge.

Email ian.hodge@fast-track-events.com

Entry £10 payable on the night.

Derek Ibbotson 1500m Classic

The Mens 1500m A Race at Trafford on 11 August will incorporate the celebration of Derek Ibbotson's 50th Anniversary of breaking the World Record for 1 Mile.

British Milers Club v Irish Milers Club

The second annual Nike 1500m challenge for men and women will also be held in the Trafford meeting with BMC teams from England, Scotland, Wales taking on last years winners IMC. Additional prizemoney for winning teams.

BMC Nike Grand Prix Final

Men and Women 800m – Winners of the "A" races in the first 4 Grand Prix are guaranteed an "A" race.

Men and Women 1500m – Winners and runners up guaranteed an "A" race.

Top Men & Women Under 20 in each Grand Prix to be invited to Final.

BMC NIKE GRAND PRIX and ENDURANCE INITIATIVE

Overall Directors Steve Mosley 029 2030 6733, Tim Brennan 01628 415748

Entry Fee for BMC Members free, Non Members £10 (Development Races £5).
Stadium entry £3 - payable by all athletes and spectators.

Sat 9 Jun	Sports City	M800, M1500,	Norman Poole	0161 980 8358
	Manchester	W800, W1500,	John Davies	0161 611 9065
		El M & W 5000 & M & W 3000S/C	Mike Deegan	01457 765416
Sat 30 Jun	Watford	M800	Andrew Osment	07879 678917
		M1500	Rupert Waters	07790 767433
		W800, W1500	Tim Brennan	01628 415748
		El M & W 3000S/C	Pat Fitzgerald	01895 811822
		M10000, W10000 UK Championships	Ian Hodge	See below
Sat 21 Jul	Solihull	M & W 800, M & W 1500	Steve Mosley	029 2030 6733
		El M & W 3000	Steve Mosley	029 2030 6733
		Peter Coe Mile M U17, U15	John Cooper	07751 662837
		Frank Horwill Mile U17, U15	John Cooper	07751 662837
Sat 11 Aug	Trafford	M & W 800, M & W 1500	Neil Canham	0161 225 5156
		El M & W 3000, M 10000	Neil Canham	0161 225 5156
Sat 25 Aug	Crystal Palace	M800,	Andrew Osment	07879 678917
	Nike GP Final	M1500, Nike Mile	Rupert Waters	07790 767433
	In conjunction with	W800, W1500, Bowerman Mile	Steve Mosley	029 2030 6733
	UK Challenge Final	El M & W 5000 & 3000S/C	Pat Fitzgerald	01895 811822

Pacemakers

The BMC is looking for pacemakers for it's 2007 race series for men and women's 800m and 1500m events. BMC is able to pay small fees for pacemakers. Those interested should contact Tim Brennan on 01628 415748 or via the BMC website.

Those interested in pacing El events should contact Spencer Barden on 0870 9986715

Overseas Athletes

The BMC welcomes overseas guests in it's Grand Prix races particularly those of an international standard. Contact Tim Brennan on 01628 415748 or enter via the website.

Prizes

Prizes of up to £1000 are on offer for BMC 800m, 1500m races and up to £500 for the UK Athletics endurance races. The prize money is determined by finishing position and time. See website for full information. Nike will award a bonus of £1000 to the first British runner to break 4 mins in the Nike men's Mile and the first British women runner to break 4:30 in the Bowerman Mile for women at the BMC GP Final.

Television Recording

It is planned that our major meetings are to be filmed and recorded by sportuk.tv a dedicated internet sports channel. Your entry will confirm your acceptance to be filmed at those meetings.



athletics data
www.athleticsdata.com

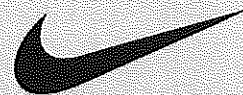
SPORTUK.TV

BMC ACADEMY YOUNG ATHLETES PB CLASSICS

Entry Fee for BMC Members £3, Non Members £5.

Mon 7 May	Millfield	M800, M1500, M3000 mixed	Mike Down	0117 973 3407
Mon 7 May	Millfield	W800, W1500, W3000 mixed	Steve Mosley	0292 030 6733
Mon 7 May	Trafford	M & W 800, M & W 1500, 3000 mixed	Neil Canham	0161 225 5156
Sat 19 May	Watford	M & W 800, M & W 1500, 3000 mixed	Jim Bennett	07971 463452
Sat 4 Aug	Coventry	M & W 800, M & W 1500, 3000 mixed	Paul Hayes	02476 464010

Fastest of U15, U17, U20 PB Classic 800m and 1500m in May to be invited to Solihull Grand Prix.



MILE SERIES 2007

ROAD MILE

BMW GROUP PLANT OXFORD ROAD MILE

Saturday 12th May 2007 11.00am

PART OF OXFORD MILLENNIUM CELEBRATIONS

REPORT IFFLEY ROAD TRACK

PRIZES FIRST 3 MALE & FEMALE £100, £75, £50

presented by SIR ROGER BANNISTER

Athletes with faster 1500m than 3.56 (Male) & 5.00 (women) should enter online or contact Pat Fitzgerald 01895 811822 Email: patfitzgerald@britishmilersclub.com for details

BMW Group
 Plant Oxford



TRACK MILES

CELEBRATION MILE 30TH ANNIVERSARY NOTTS MINI LEAGUE

MANSFIELD Sunday 8 July 2007 12.00

PRIZES FIRST 3 MALE & FEMALE £75, £50 and £25

Enter online or contact John Cooper 07751 662837 Email: 800mman@fsmail.net for details.

PETER COE MILE FOR U17 & U15 MALE

FRANK HORWILL MILE FOR U17 & U15 FEMALE

SOLIHULL Saturday 21 July 2007

By Invitation with qualifying conditions from BMC ACADEMY PB CLASSIC SERIES

Awards for first 3 each age group

Enter online or contact John Cooper 07751 662837 Email: 800mman@fsmail.net for details.

TIM WEALTHALL MILE & BMC WOMEN'S MILE

NOTTINGHAM Tuesday 14 August 2007

PRIZES FIRST 3 MALE & FEMALE

Enter online or contact John Cooper 07751 662837 Email: 800mman@fsmail.net for details.

NIKE MILE for Men

BOWERMAN MILE for Women

CRYSTAL PALACE Saturday 25 August 2007

PERFORMANCE RELATED PRIZES for first 3 Men & Women

£1000 for FIRST BRITISH MAN UNDER 4 Minutes and First British woman under 4.30.0

See Grand Prix advert or website for entry information



SIR ROGER
 BANNISTER
 BMC Member 1954



LORD
 SEBASTIAN COE
 BMC Member 559



STEVE OVETT
 BMC Member 660



DEREK IBBOTSON
 BMC Member 210

All entries should be made on our website www.britishmilersclub.com



THE BEST OF BRITISH FROM THE BMC

www.britishmilersclub.com

 **athleticsdata**
www.athleticsdata.com

The Legacy of Arthur Lydiard

The name of Arthur Lydiard first came to prominence in 1960 when three of the athletes that he coached won medals at the Rome Olympics. Why is this significant? Peter Snell won the 800m, Murray Halberg the 5000m and Barry Magee bronze in the marathon. They all came from a small part of a fairly small country which had a fairly small population (only just over 4 million).

Lydiard was the reason for this startling development. He produced a system which was to change the face of middle and long distance running. The Swedes and Finns who had dominated distance running for decades had used fartlek and interval running. Interval training had been used as the scientific type of training by Gordon Pirie, Emil Zatopek, Roger Bannister and many others

Lydiard had experimented on himself over a period of years and used his system to train the Olympic medallists of 1960. In short Lydiard was an empiricist, he developed a system that worked and he had no background in science or physiology. He earned his living as a milkman. His system was based on developing an endurance base for the athletes first and then building on the speed and going for a peak performance. He is remembered largely for advocating that runners need to do 100 miles a week for a period, but the Lydiard system was much more than this. He had strong views and got tremendous loyalty from his athletes. Halberg still referred to Lydiard as "coach" when he was in his 70s.

What was the system? The base period was to be 100 miles of running a week; he demanded "seven days a week of running as a minimum". Rest days played no part in the system and Lydiard maintained that injuries were few and far between

The 100 miles a week were to be run as follows:

Monday	10 miles at half effort (not half speed)
Tuesday	15 miles at one quarter effort
Wednesday	12 miles fartlek
Thursday	18 miles at _ effort
Friday	10 miles fast
Saturday	20-30 miles easy _ effort
Sunday	15 miles _ effort.

This base period lasted ten to twelve weeks and then followed the hill training phase, which is probably the least understood part of the Lydiard system and the hardest part. In Run to the Top he talked about finding a hill that was half a mile long with a gradient of one in three. (This may be an exaggeration)

The session would be preceded by a 2 mile warm up. The athlete would then spring up the hill on his toes. This teaches relaxation. At the top of the hill the runner would jog for 440 yards before striding out down the hill. At the bottom of the hill he would perform

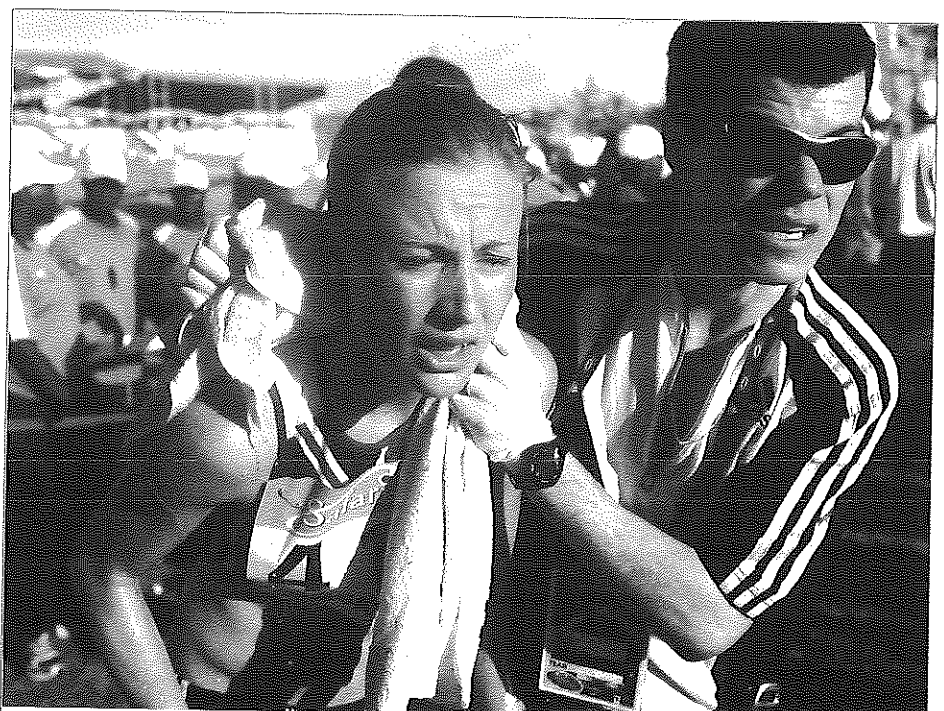
short, sharp sprints of 3x 220 yard or 6x 50 yards. This would be completed four times in the session. Often 10 miles would be run during the session. There would be some days of easy running and a long run at the weekend. The strenuous hill phase would last for six weeks.

After this comes the period for building in the speed and the training becomes more event specific. During the first month of speed training for a miler the sessions would be as follows:

Monday	2 miles at _ effort
Tuesday	4x 800m at _ effort
Wednesday	12x 300yards followed by 880 yards at _ effort
Thursday	6 miles _ effort
Friday	1 mile at _ effort followed by 1 mile at half effort
Saturday	long run 20 miles

During the third month a week for a miler would be:

Monday	3 miles of 50 yard sprints followed by a jog recovery
Tuesday	time trial _ mile
Wednesday	6x 440 yards at _ effort



Mombasa, 24.3.07. ELEANOR BAKER is helped by DR. NOEL POLLOCK at the end of the senior women's race. photograph by Mark Shearman.

Thursday 3 miles at _ effort
 Friday 3 x 220 yards flat out
 Saturday 880 yards race
 Sunday long jog

Lydiard that there had been too much emphasis on hard intervals in the past and this would not increase standards and was doomed to failure.

In later years he did shift his ground a bit. In "Run to the Top" there is a picture of Peter Snell running a world mile record of 3 mins 54.4 secs at Wanganui in 1962. Lydiard said "If ever proof was needed that arms are not necessary for the runner, here it is". He also changed his view on weight training by saying "Don't waste time flinging weights about" He conceded in "Arthur Lydiard Master Coach" that strength training was important. His views may have something to do with the fact that Murray Halberg had a withered arm.

Some of Snell's world records were set on grass, what would they be worth in

today's terms if the races had been run on all weather tracks?

One of Lydiard's regrets was that he didn't get the recognition that he deserved in New Zealand. The result was that he spread the gospel to the USA, Finland and anywhere else that wanted to listen to him. Indeed he had a big part in the revival of Finnish distance running in the 1970s.

It is interesting that although Lydiard did not have a science background, physiologists later explained why his system worked; that is the increased capillary density and the increased number of mitochondria (energy furnaces) in the muscle, brought about by the endurance work. Although Lydiard was not a physiologist it is interesting that his most famous athlete Peter Snell went on to become one. He works at the University of Texas in Dallas, USA. He still believes that a big volume of distance running is important. Research has shown that not only do slow twitch muscle fibres

become depleted of glycogen, as expected, but fast twitch fibres become depleted as well, so fast twitch fibres are activated, even when the pace is slow. One of the criticisms of the system is that speed suffers. Snell deflects the criticism by saying that speed will be regained in the race specific phase of training and by using a leg speed session once a week during other parts of the training

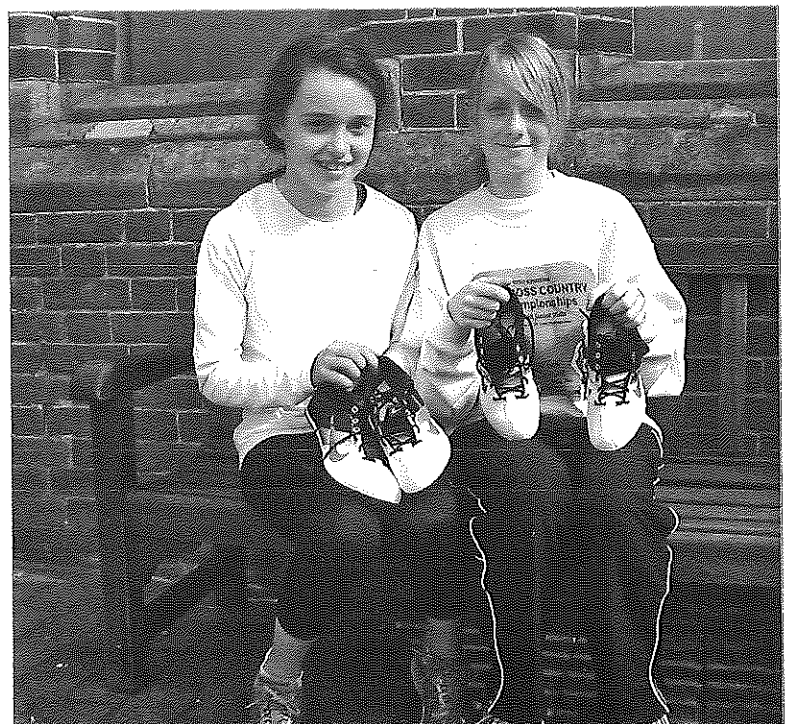
In the same way that Dick Fosbury revolutionised high jumping with his new technique in 1968, Lydiard changed distance running with his system. His legacy may be the 100 miles a week that people often quote or even the long Sunday run. What is for sure is that his mark will be left on athletics for a very long time.

Run to the Top 1962
 Running With Lydiard 1983
 Arthur Lydiard Master Coach 2004

New spikes for academy members

As part of a deal with our sponsors, Nike, all members of the Academy are to receive a free pair of spikes this year. The first batch of these were handed out at our recent course at Ardingly College, Sussex which was held from 30 March until 1 April.

The first recipients are pictured below: Beth Swords from Oxford and Dea Anna Davey from Lincoln Wellingborough. Let's hope they all run pb's this season in their Nike spikes and Academy vests!



We will never catch up the African runner

by Frank Horwill

This declaration was made by a person employed by U.K. Athletics, ostensibly, to improve British endurance running, a year ago at a BMC/UKA coaching course in the Midlands. For some unknown reason the speaker turned to me and asked, "What do you think, Frank?" Not being a defeatist by nature, I replied that we could. To this he observed, "I don't think so. We might be able to hold our own in the 800 and 1500 metres, but the other distances are out of reach." One must admire his frankness if not his diplomacy.

One wonders how Winston Churchill would have reacted after the Dunkirk retreat and all Europe was under the Nazi boot if he heard one of his generals declare, "We will never defeat the Germans." I do not think his feet would have touched the ground towards the scrap heap.

There is something a little ironical and not a little hypocritical about receiving a salary for a task that one feels is impossible. It is also astonishing that his superiors continue to pay his wages to do a job that he admits he cannot do. But, hold on a minute! Apparently, UKA don't pay his dues, according to rumours he is financed by a powerful commercialised running organisation. Suggestions as to how we should close the gap on the African distance runner range from the possible to the ridiculous. One correspondent to AW in decrying aid from physiologists suggested that our distance runners should emulate Zatopek's training methods. Fantastic as his achievements were, his time for 10k is now more than 2-minutes faster, for the 5k, 90-seconds, and for the marathon, 20-minutes. To suggest that Zatopek's daily schedule of 20 x 200, 40 x 400, 20 x 200, will now result in British

runners running sub 13mins/5k, sub 27mins/10k and sub 2:08 for the marathon stretches the imagination beyond belief.

Two men, the Swedish physiologist, Bengt Saltin and Prof. Tim Noakes of South Africa, have sought to investigate the physiological difference between the African and European runner. Saltin has had close links with the Kenyans for 40 years. Noakes, the author of *THE LORE OF RUNNING*, is an accomplished ultra-marathoner and world famous for his running research. Both men tended to concentrate on training methods rather than environment and way of living.

Saltin was most interested in the composition of runner's muscles. At the famous Roman Catholic school from which most of Kenya's great runners emerge, he took muscle biopsies from a group of teenage athletes and discovered they possessed the highest concentration of mitochondria and aerobic enzymes that he had ever experienced. What was the cause? They were in the middle of a 12-week block of training where each day they ambled out for 5k and then ran 5k full out on the return journey. Work at 5k speed is 98% of the VO2 max, something which Seb Coe and Steve Ovett did regularly.

Noakes in his investigations followed a different line. He amassed the training methods of all the leading African and European runners and their personal physical data. His findings were astounding. One-third of the Africans' total volume of running was executed between 80 and 100% of their VO2 max. The Europeans did only 10%. In other words, the latter spend too much time running too slowly, or put another way, on junk mileage. Running at

100% VO2 max equates to one's 3k speed, 90% to 10k speed and 80% to half-marathon pace.

Noakes also discovered that the African had a better weight to height ratio, put bluntly, the European runner has too much surplus body fat. Whether this is due to the consumption of too high fat foods or the slower speed of running is difficult to decide.

But, the words of the late running sage, Dr. George Sheehan, are prophetic, "The key factor in distance running is weight relative to height." More recent work suggests that the distance runner's diet should consist of 80% carbohydrates, 10% protein, 10% fat. Given a 6ft tall male distance runner, what do you think is a good racing weight? Well, according to Dr. Stillman, it is between 142 and 159 pounds, for a female of the same height, it is from 128 to 144 pounds.

The inevitable question of whether being born at altitude proffers an advantage over the runner born at sea level is contradictory. Coe, Ovett, Cram and Moorcroft, recorded times which are still highly respectable today, all born at sea level. However, the first three made frequent excursions to altitude for training obviously in the belief that performance was enhanced. However, runners from other altitude countries are not so renowned, so being an altitude native is not a panacea for success. Soviet female distance runners followed a pattern of a month at altitude and two months at sea level throughout the year and were the dominant distance runners for two decades.

A striking difference between the African distance running set up and our own is the lack of sophistication in the

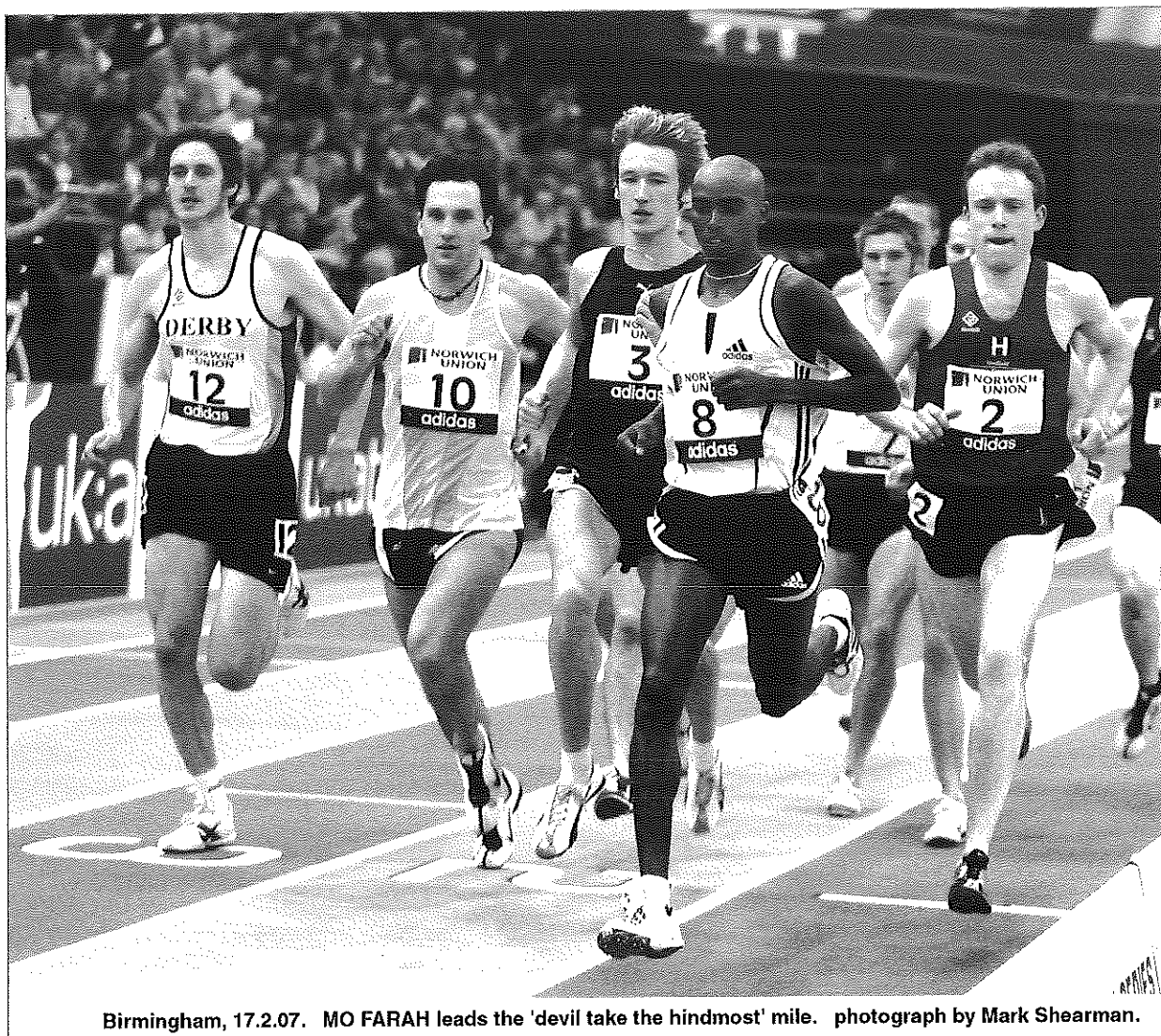
former. One famous African coach who witnessed our national road relay, observed, "What's the point of this?" I could not think of a suitable reply. Later, I thought about his question and realised that some of the things we cherish as traditional are totally foreign to our opposition. The glorification of the club plays a minor role in African athletics, exaltation of the nation's athletics prowess a major one. I think it was Peter Thompson in his role with the I.A.A.F. organising international coaching courses, which told me that the number of paid officials for each African governing body could be counted on the fingers of one hand.

When asked by an African coach how distance running is developed in the U.K. I had to think hard because once it was simple. There was a national event coach on a part-time basis for

groups of events and staff coaches for the main areas and in some districts county event coaches. Clubs had their own coaches who were encouraged to get better qualified at their own expense. A league system of competition prevails and area bodies and clubs organised graded meetings, which often included BMC invitational races. County, area and national championships were a constant. National event coaches still exist and in place of staff coaches a number of full-time coaches are stationed at centres of so-called excellence and some, unfortunately, have partisan allegiance to the club of their origin. Then, there comes a proliferation of officials, one to seek out promising juniors, one to look after the needs of elite potential, one to get competition abroad, etc. A vital one appears to be missing: an investigator as to why we cannot get our male

athletes to crack existing U.K. records from 800 metres to the marathon for a start. The current answer from the UKA to the last question appears to be one of bullying. "You will do as you are told or you won't get any cash from us." This takes the form of, "If we don't like the colour of your coach's eyes you will be allocated to one of a better hue that we select." This means there isn't much point in the club coaches seeking better qualifications at their own expense.

There is no reason why all Level 4 coaches actively engaged in coaching should not receive an honorarium for their efforts. The world was saying in 1976 to 1986, "Will we ever challenge the British runner?" They did. How they did it is no great mystery, really.



Birmingham, 17.2.07. MO FARAH leads the 'devil take the hindmost' mile. photograph by Mark Shearman.

Training sessions that inspired

by Frank Horwill

The history of endurance running reveals that many great runners had what they would call a "feared" session which when eventually conquered actually became their favourite training workout.

Just before the 1936 Olympics, Jack Lovelock of New Zealand who was a Rhodes Scholar at Oxford, faced a predicament. Two recent defeats in the mile at the hands of Sydney Wooderson had undermined his confidence in winning the Olympic 1500 metres. He decided to hedge his bets by training for both the 5,000 metres and the shorter distance. He chose two special training sessions weekly. The first was to run three-quarters of a mile in 3 minutes. The second was to rattle off 2 miles in 9 minutes. Both were inside world record pace. The first was a second a lap faster as was the second. For Lovelock, a strange thing occurred, after six weeks of this routine he noticed that his test run over the shorter distance was becoming "too easy." The two-mile spins had helped to improve his endurance for the mile. He decided on the 1500 metres, which he won in world-record time.

Peter Elliott, Olympic silver medallist, also placed great importance on his ability to run 1200 metres regularly until the time equalled world record pace, which in those days was sub 2 mins.50secs at the end of the third lap.

While most people thought that Bannister's habitual session of 10 x 440 yards followed by a lap jog in 2-minutes was the formula to run a sub 4 mile, many who could rattle off that number of circuits in sub 60-seconds found that the feat escaped them. What they didn't now was that Bannister did all his 440s at Paddington track for all to see and his

3-lap excursions elsewhere in well under 3-minutes. He was to break the unofficial world record for the distance which would have required only a further lap in 64-seconds to crack the 4 barrier.

On a lesser note, one of my former athletes, Jim Douglas, dubbed "The Marine Marvel" was particularly fond of repetition half-miles with a lap jog recovery in 3-minutes. On the then ash track at Exeter he rattled off the first three in 1min:56secs which gave him the confidence to break the U.K. record for 1500 metres in Greece in 1970, which lasted only 14 days! He was to run a 3 mins: 56secs mile with Ian Steward and Brendan Foster in front. Those were the days!

The comparatively unknown South African miler, Johan Fourie, who was prevented from competing internationally by the boycott, ran fifty-four sub 4-minute miles and two in one day, did a murderous weekly training session of 1 x 880yds, 60secs rest, 2 x 440yds with 60secs rest. Sounds simple until one heard that the target for the half miles was 1min.50secs and for the 440s 56secs. Added together this made a mile time of 3mins.42secs. He added amusingly to his recollection the session, "When I could do that I knew I was ready for a good one."

Some noted distance runners have an uncanny feel for their event and introduce techniques that simulate the race. Vladimir Kuts, Olympic gold medallist and 5k world record holder was the first athlete we know of who altered the stereotyped recoveries in repetition running sessions. Given 20 x 440yds he would jog 440yds for the first four, 330yds for the second block of four, 220yds for the third and 100yds for the rest.

Just before departing for the 1984 Olympic Games 5k, Tim Hutchings, already an I.A.A.F. World Cross-Country silver medallist, requested a mammoth session totalling twice the 5k distance and suggested 25 x 400m. I decided the recovery time should replicate race conditions so it started with 90-seconds and decreased by 15-seconds after every repetition, the process being repeated throughout. As it happened, the actual final followed the same pattern with the winner running the last mile in 4:02 and Hutchings in 4:06 to finish fourth improving his 5k time by 11-seconds.

Peter Snell, triple Olympic gold medallist and world-record holder for the half and one mile, was another who liked the occasional 20 x 400. However, his 60 metre sprints with NO jog recovery for two miles covered in 9mins.30secs with three sprints per lap was the forerunner of "the new interval training" discussed in an article by Peter Thompson in A.W. a year ago. In this, the traditional jog disappears and instead of doing 400s in 60secs with 200 jog in 90secs, 400 is run in the same time. As soon as the required time cannot be registered complete rest is given before the session is resumed.

Although there is a cloud over Cierpinski's two Olympic marathon gold medals there isn't much doubt about his training methods which are diametrically opposed to many expressed in A.W. For a start, his weekly long run was nine miles longer than the marathon distance. No fear of the distance for him. His speed work included 3 x 10k on the track in 29 minutes each. That's two-thirds of the marathon distance covered in sub 4:40 miles. It was to hold him in good stead for in the second half of his Montreal

race someone stuck in a 29-minute 10k. When asked if this shook him up a little, he replied, "Not at all, I do three of those in a row in training each week."

Russian coaches of old and many Kenyan greats have a penchant for sessions that equal the distance of the race repeated several times. For instance, numerous Russian female 1500 metre runners of fame have reported doing the workout of 1 x 400 plus 1 x 800 plus 1 x 300 which totals 1500 metres two or three times in one session. One can see a fast start, settling down and a fast conclusion. There is also the psychological benefit of adding up the accumulative time. If the first 400m is run in 64 secs and 800 is done in 2:10 and the last 300 in 45secs, the total time is 3:59 and if this is repeated in the next reps an estimate of expected race times can be predicated if recovery times are kept minimal. The Kenyan combinations for the 5k are somewhat daunting and include:

1. 3 x 1600 200 fast jog plus 1 x 200 repeated after good rest.
2. 1 x 800 100 fast jog plus 1 x 2000 300 fast jog plus 1 x 1600 200 jog

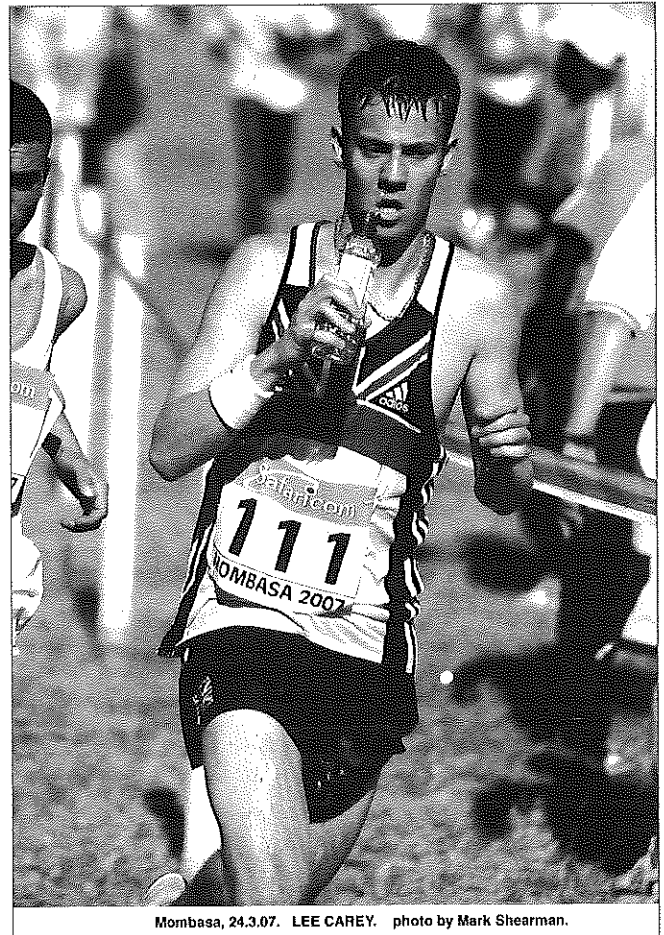
plus 1 x 600 repeated.
3. 1 x 1000 100 fast jog plus 1 x 3k 400 fast jog plus 1 x 1k repeated.

4. 1 x 1200, 100 jog plus 1 x 2400 jog 300 plus 1 x 1400 repeated.

My personal favourite 5k session is:

1 x 1k at 5k speed, 100 jog, 1 x 500 at 3k speed, 100 jog x 4, done once. The 4k speed may range from 62-72secs/400 and the 3k speed 58-62secs for males. The winner of the 1948 and 1952 Olympic 800 metres must go down in history as one of the first athletes to devote all his attention to tactical training. Not possessed of great 400 metres speed he rehearsed accelerating over the third 200 metres and then ran 300 metres making the distance 900 metres. During the winter he concentrated on 400 metres steady

accelerate 100 metres to 500 metres. He extended this acceleration zone gradually in the summer. Some of the opposition he defeated in this way were frequently 1.5 to 2-seconds faster than he was at 400 metres. The race is not always won by the swiftest but often by the craftiest.



Mombasa, 24.3.07. LEE CAREY. photo by Mark Shearman.

50 years ago

In 1956, Derek Ibbotson equalled Roger Bannister's 3:59.4 giving an indication of what he could do. So it was that on 19.7.1957 that as part of the London-New York at the White City Stadium he lined up for the Invitation Mile at 20.00 hours. The field was stellar and included the 1956 1500 Olympic Champion, Ron Delany and Stanislav Jungwirth, who had achieved a new world 1500 mark of 3:38.1 the previous week. In addition there was Ken Wood a leading British miler and Alan Gordon (who had run in THE Bannister race).

Ibbotson had already posted a 3:58.4 in Glasgow a month earlier so was in prime form. The race kicked off with Mike

Blagrove taking the first lap in 55.3 ahead of Jungwirth at 55.7 and Ibbotson at 56 seconds. Blagrove held the lead but slowed to 1:55.8, Jungwirth still second at 1:56.1 and Ibbotson on his heels at 1:56.4. With Blagrove weakening Jungwirth found himself a reluctant leader at the bell, reached in three minutes exactly.

From here the pace increased, and running in an RAF vest, Derek came home in 3:57.2 (1500 time was 3:41.8). His lap times were 56.0, 60.4, 63.9(!) and 56.9. His world record would last until August the following year when Herb Elliott bit a huge chunk out of it, reducing it to 3:54.5 in Dublin.

A little more commitment please

by Frank Horwill

Sports psychologists are fond of using the word "commitment". The dictionary defines the word as meaning: an obligation undertaken: declared attachment to a doctrine or cause. Perhaps one of the greatest acts of physical commitment occurred in the mile race between Roger Bannister and John Landy of Australia in Vancouver 1954. The race had the promise of being an epic struggle between two men at the summit of their fitness. Bannister had achieved what was then seemingly impossible by running a sub 4-minute mile on 28 miles a week three months before their clash. A month later, Landy improved on Bannister's time by a second on double the mileage and often training without a rest day for several weeks.

Both had widely differing views on how a race should be executed. Landy had declared, "I'd rather lose a race in sub 4 than win one in 4:15." Bannister issued no such edicts, his wins came from waiting and striking in spectacular fashion over the last 300 metres as his fellow Oxonian and medical student, Jack Lovelock had done in the 1936 Olympic 1500 metres, breaking the world record to boot. Alf Wilkins, co-founder of the BMC in 1963, in a letter to me argued that the decline of British miling in the 1960's was due to our athletes emulating Bannister's tactics.

The bookies made Landy a slight favourite, he had after all run a faster time. However, Landy discussed his strategy with his team colleagues. Some suggested, "Don't lead, it will confuse Bannister, start going at the half." Landy observed that he may be able to run the distance faster than Bannister but doubted his ability to run sections of it faster. In any case, it would make for a slower race. "This is not my style, I'm committed to running full-out all the way." He set a blistering pace; so much so that by the end of the third lap his lead was so great that Bannister became alarmed asking

himself, "Why have I allowed this huge gap to occur?" Landy still led into the home straight and must have thought he'd pulled it off and glanced over his left shoulder, a big mistake, overtaking athletes invariably are glimpsed or sensed over one's right shoulder. Bannister shot past and as Landy faced the front again he realised his commitment had been valiant forcing Bannister to lower his mile time in winning and collapsing in a heap, utterly spent. Landy had kept his word, "I'd rather lose in a good time than win in a lousy one."

Moorcroft's wife recalls the season when her husband nearly ran the first sub 13-minutes 5k to break the world-record by a huge margin, still a U.K. record after 24 years. "He was different," she remembers, "there was an urgency about him I had not seen before. He had total commitment to his running." The day before his epic race, his coach John Anderson declared, "Tomorrow, Dave will break the 5k world-record."

Well, just how does one acquire this magical commitment? It seems that there must be a longing, a desire to achieve something that has hitherto been deemed just out of reach. I recall a few years ago getting a letter from a Hampshire runner of above average ability in which he stated he was nearing the end of his athletics career and there was just one more thing he'd love to achieve – run a sub 4 mile. The reason for his writing was that, unlike many people he found my articles inspiring! I did not wish to argue with this eulogy! This was in March and I mapped out a plan for him based on the 5-pace system of training used by Seb Coe. But, I added something extra. After all running sessions I gave him a small amount of sprint training since he claimed he was often out sprinted in races. Distance runners have to sprint at the end of races when tired. I forecast that the 14-

day cycle of training when completed six times would enable him to execute his goal. Three months later I received a phone call from him in Cork, his first words were, "I've cracked it Frank." He was to run three more sub 4-miles that season. He then retired. Harry Wilson, Ovet's coach, believed that there was a period of six weeks in a track season when an athlete had to give total commitment to all training sessions, he called it, "buckling down" a renewed intensity of purpose, a stepping up in effort and attitude.

Commitment is a departure from routine. We have seen many times on TV athletes who have virtually stated at the outset of a race, "These guys are too fast for me, I'll settle down with others of my ilk and hope to beat a few of them at the end." It would make a change if some would think, "I wonder how many laps I can stay with these guys, I might surprise them and myself."

It might occur to some that running a personal best 3k in the middle of a 5k and still being with the leaders may inspire them to reach new heights. The same applies to tagging along with the leaders to 5k in a 10k race. Nothing ventured nothing gained. Commitment, then involves having a target, which is reasonable and challenging. We need to allocate a time limit to achieve it. Physiologists agree that following exercise six days a week for twelve weeks brings about major changes in the body for the better. We require to know the tough spots in our event and train accordingly until they become facile. Our race programme should be stepping-stones to the ultimate goal. Deviations should be ruthlessly eradicated; a late night is heresy, a high-fat snack a toxic invasion. Yes, there's a lot involved in total commitment. Some who have embraced it for 10 or 15 years as runners have in addition to gold medals enough money invested for a lifetime.

Taking the right road

Opinions will differ as to what the right route to success in the track season constitutes. However, whatever route we take it must be logical and make sense and not nonsense. First of all we need to LOOK BACKWARDS AND LOOK FORWARDS. How did the last track season progress? Did performances improve? Were targets achieved? If not, why not? I always remember an athlete saying to me years ago, "I'm disappointed in my 800 metres time this year." I asked him how many he had done and he replied, "One". The statistical evidence is that it takes five to seven races at one's short middle-distance events to peak, less for longer events.

During the first ten years of a running career starting from the age of 14 years, an athlete will do well to improve the 800 metres time by 2-seconds a year if male and by 1-second if female. These figures are doubled for the 1500 metres. There are, of course, exceptions. Unfortunately, many under 18 U.K. age record-holders for these distances do not maintain their progress.

Targets for a season need to be realistic and not pie-in-the-sky like the man who rang me up and blurted out, "I want to run a 4-minute mile." I asked him if he had broken 4-minutes for 1500 metres yet. He hadn't. He was over 40 years!

The goal established its execution requires some thought. Some will seek physiological back up. There is plenty about. However, logic tells us that there are three essential training needs to be performed weekly:

1. Rehearse the target speed required.
2. Train faster than the target speed
3. Train slower than the goal speed, but

not too slow as to be useless.

How we allocate the ratio of these sessions weekly has been accurately defined by A.V. Hill in 1932 and Fox and Matthews in 1976. However, there are those who believe that such deliberations border on "rocket science" like the correspondent to A.W. who wrote in taking exception to the word "mitochondria" being related to endurance fitness. But, we can generalise. The faster the speed per 400 metres of an event the more we need to train faster than that pace. The formula for predicting a maximum possible 800 metres time is – best 400 metres time plus 4-seconds x2. Thus a female with a best time of 60secs/400m will do well to record 2:08. Future improvement will revolve around improving her 400 metres time, which will require more sprint and strength training sessions.

There are two ways of vaccinating an athlete with the required event speed:

1. Straight-through repetition running involving twice the distance in volume and half the distance of the rep: run as a jog recovery. An introductory session for an athlete wishing to crack 4mins/1500m might be – 16 x 200 in 31secs, jog 100m in 45secs. Progressing to 3 x 1k in 2mins.40secs with 500m jog in 3mins.45secs.
2. Repetitions in sets, each set equal to the distance of the race with short recovery but ample rest after each set. A female with ambitions of running sub 2-minutes for 800 metres may attempt: 8 x 100 in 14 secs with 20secs standing rest. 5 mins jog recovery. 4 x 200 in 29secs with 45secs rest. 5mins rest: 2 x 300 plus 1 x 200 in 44secs and 29secs respectively with 60secs rest after 300s.

A reasonable rule-of-thumb method of training faster than race pace is to choose the speed of the next event down. Thus a 1500 metres specialist will select 800 metres pace and the two-lapper 400 metres speed. This procedure can also be applied to work slower than race speed. i.e. the distance above

A weekly programme for a 1500 metre runner could look like this: -

- Day 1 - Over-distance slower – 3 x 1500 at 3k speed, jog 400 rest.
- Day 2 - Under-distance faster – 4 x 400 at 800m speed, jog 400.
- Day 3 - Target time distance – 4 x 800 at 1500m speed, jog 400
- Day 4 - Over-distance – 1 hour steady run.
- Day 5 - Repeat Day 2.
- Day 6 - REST
- Day 7 - Race or time trial at 1200m

On the same lines a weekly regime for an 800 metres specialist could be: -

- Day 1 - Over-distance – 3 x 1k at 1500m speed, jog 500m.
- Day 2 - Under-distance – 1 x 350, 1 x 300, 1 x 250, 1 x 200, all full out with lap walk recovery after each.
- Day 3 - Target distance time – 1 x 600, jog 600, 2 x 300, jog 300, 4 x 150, jog 150.
- Day 4 - Under-distance – 8 x 100 full out, slow walk back.
- Day 5 - Over-distance – 45mins steady run.
- Day 6 - REST
- Day 7 - Race or time trail 500 metres.

At a BMC training day many years ago with the Royal Army Physical Training Corps at Aldershot I asked a 16 year old female what her event was to which she replied that it was 3k. I then

enquired what time she had done for 1500 metres. She replied, "I don't run 1500 metres." Well, first of all how boring it must have become to race 3k a dozen times in a season. However, BMC research based on those who raced over and under distance regularly compared to those who were one-distance racers revealed that the percentage of annual improvement in the first group was far greater. The ideal sequence being for the 1500 metres specialist – 1st race – 3k. The best regime for the two-lapper being: 1st race – 1500m. 2nd race – 400m. 3rd race – 800m. However, it should be noted that in the United States 800 metres specialists are not encouraged to race over-distance, the emphasis being on racing 400 metres before any major two-lap event.

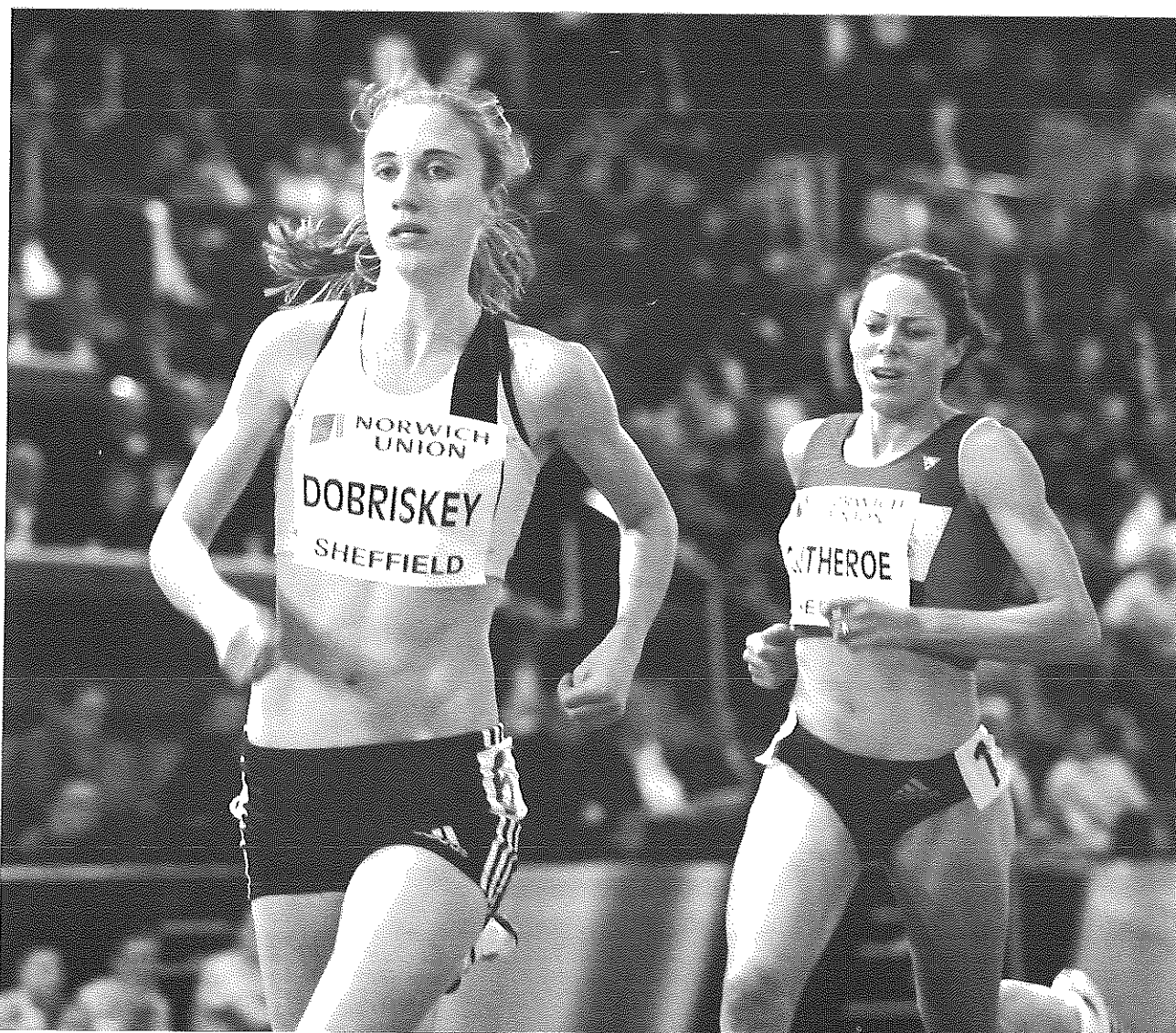
The HAWTHORNE PHENOMENA, which appeared in sports psychology books a decade ago, is worthy of study and execution. It originated from two industrial psychologists in the U.S.A. who advertised that they could increase production in factories and efficiency in offices without fail. The basic concepts applied to endurance running are:

1. Training which remains basically unchanged for 12 weeks will lead to a decline in performance, or a plateau of fitness.
2. No repetition distance should be repeated twice in one week.
3. Training at one speed all week should be avoided.
4. The training surface should be changed for a week every six weeks.
5. A training day at another venue

should occur monthly.

6. A training weekend or training week should be organised on a regular basis in a totally different environment.
7. Food intake should differ from the previous day with emphasis on fruit and uncooked foods.
8. Alternate training shoes daily.
9. Vary racing distances.
10. Race at home and abroad.

The two psychologists mentioned, who retired as millionaires, when asked the secret of their success, simply replied, "Change." Often, they simply recommended that the lights in a factory should be made brighter. Sure enough, production went up!



Sheffield, 10.2.07. LISA DOBRISKEY leads from HELEN CLITHEROE in the 3km. photo by Mark Shearman.

Athletic pilates

Pilates is a form of exercise that strengthens stabilising muscles, opens up weak muscles, provides balance to our posture and enables us to move with increased efficiency. Why then do athletes give such tired excuses when offered Pilates as a possible solution to a range of niggles and injuries that they become used to living with? Athletes have reported to me, "Pilates can't be any good because if it was it would already be in Athletics", "I tried it but I can already lift my legs in the air so I don't really need it", "I did some core stability work with a medicine ball with my friends last week". Physiotherapists and osteopaths of the world unite; rub your hands with glee and wait (not very long) for the next client. As athletes we are in danger of accepting the fact that injuries happen to us as a result of factors we can't control, 'why do we not take responsibility for our conditioning?'

That the majority of athletes are exceptionally good at working hard is not in doubt and when the going gets

tough, we'll work a bit harder. If we didn't there is no way we would finish '20 400's' on a wet, cold and windy Thursday night. Brendan Foster may have once said the real runner 'goes to bed tired and wakes up even more tired' but Albert Einstein said 'the definition of stupidity is doing the same thing and expecting a different result'. How else can we explain our inability to grasp, practise and enjoy the benefits of a simple exercise whose principles are not rocket science but simple common sense and the reason why more and more physios are training to become Pilates teachers and using Pilates as part of their rehabilitation programmes. If you offered an athlete the chance to train as hard as possible, move in a way that would make them faster and less liable to break down with injury or illness and therefore be in control of their bodies, surely they would take it? That is what Pilates can offer, but how and why? This article will briefly explain five reasons why; ineffective muscle use, faulty recruitment patterns, neutral

pelvis and spine, joints and breathing and is based on research by Jull and Richardson, Janda, Schmidt, Kendall and Kendall, Mark Comerford and Shirley Sharman.

Your average 4 year old has exceptional posture and energy then they go to school and start to consistently and habitually repeat a use of their bodies that is against the way we were designed, namely they sit over desks all day, a pattern exacerbated by other features of modern life. Dr Michael Colgan stated 'we impose a sedentary lifestyle on a superb anatomical structure.... a chronic rate of

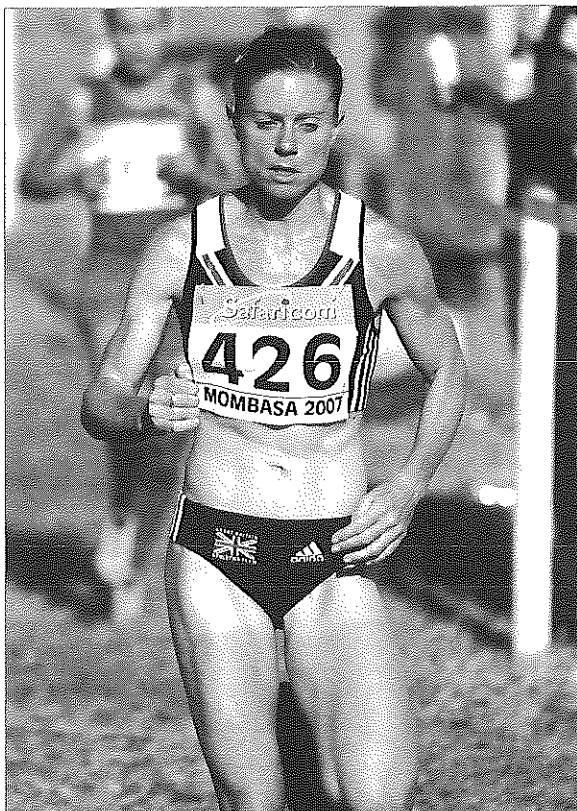
disuse that destroys bone, muscle and connective tissue alike".

1. Ineffective muscle use

Broadly speaking the human body has two types of muscles, stabilising muscles which lie closer to the skeleton, work all the time and so recruit at 25% MVC (maximum voluntary contraction) and cross only one joint e.g. transverses abdominus; and mobilising muscles which are superficial, work phasically recruiting up to 100% MVC and usually cross two joints e.g. hamstrings. The primary function of the former is to hold us upright (against the pressure of gravity) and the latter is to move us.

Consistent misuse of the body leads to weakening of the stabilising muscles by either lengthening or shortening. They no longer work correctly but because the body still has to be held upright (against gravity), the mobilising muscles take on a stabilising role thereby allowing only a percentage of its maximum power. Crucially if we run fast enough for long enough the muscle becomes overloaded and will strain, pull or tear. This is why most athletes have limits on their training, they know how many miles or how many reps of a certain type their body will allow them to handle, rather than conditioning their body first and allowing their mind to control how much training they do.

A simple analogy is that of a poorly erected building, without the correct foundations it is more likely to come down. In contrast, correct foundations mean the building will last forever, which is why good builders are at such a premium. Not doing anything to redress the balance is the same as allowing cowboy builders control of your body, don't expect it to last for ever.



Mombasa, 24.3.07. HAYLEY YELLING. photo by Mark Shearman.

2. Faulty recruitment Patterns

It is widely known that muscles work as part of a team. For each movement there is an ideal combination of muscles that fire in a certain order – a 'sound' recruitment pattern. If one of those muscles is too short or long and therefore weak the system will not work correctly. However the body still has to move and as it will take the path of least resistance, a cheating mechanism will be established which is far less efficient (and therefore less effective) – a 'faulty' recruitment pattern. A problem confounded by the fact that if you do something enough times it becomes a muscular habit and so will feel normal. Faulty posture and recruitment patterns feel normal, we only are aware of a problem when a muscle breaks down i.e. strain or tear. Which is why people are generally not aware of their faulty posture or even parts of their bodies, it feels normal but it isn't. For example, magazines often suggest curl-ups as great exercise for athletes but without the necessary guidelines. The aim of a curl-up is to strengthen your abs but also to mobilise your thoracic and cervical spine. Ask yourself, do you grip in the hips, quads or hamstrings to anchor you up or do you have tension in your neck and shoulders as you curl? If the answer is yes your movements are inefficient and your training not nearly as effective as it could be.

3. Neutral Pelvis and Spine

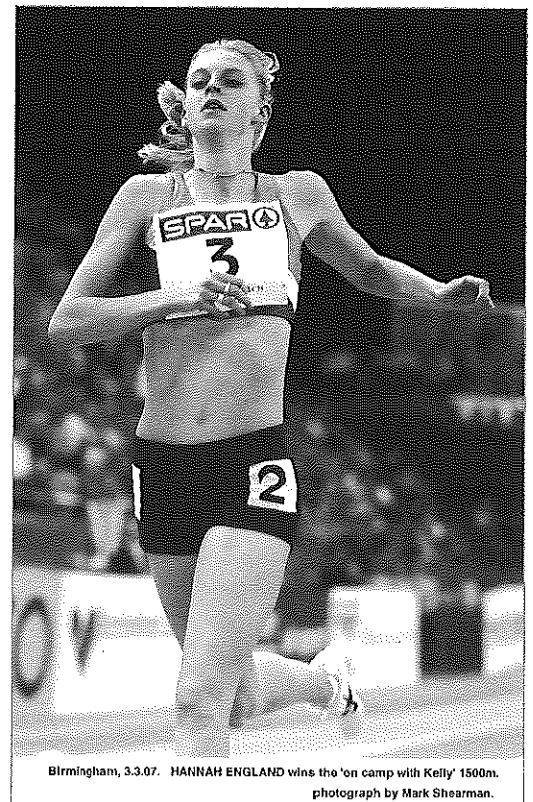
The role of the pelvis and spine is crucial to understand. For the spine to be stable the deep muscles that stabilise it must be strong enough to prevent any unwanted movement of one vertebra on another. This is 'core' stability, an overused and misunderstood term used by athletes and coaches. Core stability is the ability to keep your core stable while your limbs move. It includes spinal stability, pelvic stability and scapular stability. With such alignment your body will require the least muscular activity and therefore energy to hold itself upright

therefore allowing the muscles to focus on their correct job, running fast. Any displacement of one part causes displacement elsewhere to prevent the structure from falling. This dramatically reduces power so that according to Dr Michael Colgan 'whenever your body's centre of gravity moves outside your vertical axis, you are slower to move in every direction'. The spine fits together perfectly in relation to the pelvis. If the pelvis rotates due to the incorrect pull of the muscles it will pull part of the spine out of place. If you can't keep your pelvis stable when lying on your back and extending your leg, despite support from the ground, what is going to happen when you remove the support and start to move?

This is why stretching or resistance programs have to start from a position of neutral, if they start on an already defective spine with maintained faulty recruitment patterns the problems will worsen and hasten rather than reverse degeneration.

4. Joints

With shortened or lengthened muscles a further problem could be that joints lose correct alignment and therefore don't function correctly or move within their full range of movement. Through poor posture and muscle imbalance, the forces of gravity no longer fall through the centre of the joint and there could be excessive wear and tear, less lubrication and you have the potential for injury. The clicking you hear when stretching is likely to be bone grinding on bone, ultimately not good for the health of your body. Full range of movement is important for the lubrication and health of a joint. Joints should therefore be kept in the best possible natural neutral alignment so that weight is transferred centrally through the bones, supported by strong stabilising muscles with good muscle balance enabling full range of motion so that it can stay lubricated and



healthy. This is why clients with arthritis can feel an easing of symptoms when starting a programme of Pilates.

5. Breathing

Nearly all the muscles involved in the breathing process have a postural function so posture and breathing are interrelated. Poor posture inhibits us from taking full breaths which has an obvious impact on poor performance. In addition, our internal organs are compressed and prevented from working efficiently making us feel tired quicker (do you ever have an afternoon 'sag?'), more prone to infections and preventing us from recovering quickly. Pilates teachers rarely have colds or flu symptoms.

The Solution – What should I expect from a Pilates session

The exercises in Pilates sessions aim to strengthen stabilising muscles and stretch mobilising muscles; recruit muscles in the most efficient order; start and maintain the ability to keep neutral pelvis and spine; increase the range of movement of joints and maintain their health by providing safe movement and therefore lubricate them; and develop the ability to increase fresh



Birmingham, 2.3.07. RICHARD HILL. photo by Merik Shearman.

oxygen uptake and therefore remove stale oxygen.

Joseph Pilates developed his system initially on boxers and then ballet dancers and gymnasts, groups of people who are extremely strong and flexible. For that reason Pilates is HARD, very HARD. It takes years to master the matwork alone. One of the criticisms of athletes is that Pilates is easy, if that is the case it means the exercises are not being done correctly. Exercises are designed to take the spine through its four ranges of movement and are initiated with correct alignment, breath, stability, length and the correct muscle recruitment pattern. The pelvic floor and transversus abdominus are constantly cued in order to recruit the deep abdominal muscles (your body's natural corset) and aid stability. It is surprising how many of these features we miss if we don't have someone checking us.

A potential problem is that any individual's experience of Pilates is only as good as the teacher is. Up until last year there was no official recognised standard for the teaching of Pilates. People could attend weekend or week long courses and become a Pilates

teacher. That has recently changed and a 'standard' has been introduced which all Pilates teachers must meet before qualifying. Only Body Control Pilates and Future Fit Pilates have achieved the necessary standard so far.

In addition it is easy for teachers to overlook individuals when teaching classes, which is why Body Control will not allow classes to exceed 12 individuals. Furthermore many teachers dilute the exercise even further by setting expectations in keeping with health, as opposed to the high requirements of the ambitious and hard working athlete. In order to get maximum

benefit an athlete should look for as small a class as possible or try individual lessons interspersed with as much practise as you can fit in. If you feel it is too easy, say so. It is very unlikely that you are doing the exercises correctly. Many Pilates teachers are open to suggestions and are willing for individuals to ask for more. If that doesn't work find another teacher who will push you. Remember if you are serious about your athletics, your body is your responsibility and you need to make it work for you.

My Experiences

I was an international standard athlete who never quite made the grade, running low 3.40's despite being in better shape and then suffered successive years of breaking down just as the track season was due to take off. I became known by my peers as an 'unlucky-with-injuries-athlete'. I had tried Pilates classes but only noticed greater benefits when I took weekly private sessions. After a few weeks I noticed that I could walk up stairs a lot easier. After six months I noticed I know longer had crippling shin splints. After a year I noticed I was no longer desperate to see my osteopath or

masseur and my coach noticed I stood a lot taller. After eighteen months I noticed that I recovered from sessions a lot quicker and felt good the next morning and that I not only recovered from colds very quickly but also would rarely get them. After two years I realised I had more day-to-day energy and more awareness. I no longer felt tired in the mid-afternoon at work or slumped in the sofa on returning from work or training. Instead I wanted to be doing another activity, just as I had done as an 11 year old when I was part of nearly every club at school. I started to feel muscles I didn't know I had and it felt like someone had equipped me with a suit of armour with which I could withstand the rigours of regular 70-80 miles a week without ever breaking down. I had simply conditioned my body against the negative effects of gravity.

Start now, adopt an open and questioning mind, take control of your athletics and don't let injury hamper your careers.

Testimonials

"Since starting Pilates I know that I am a much stronger athlete, people have noticed that I run a lot taller and I no longer have crippling stitches in races, I have been able to train a lot harder without breaking down and in tough conditions I felt a lot stronger over the last few miles of this years trials which gave me a lot of confidence."

Ben Noad, Runner-up, 2007 Cross-Country Trials.

"At the end of each session I feel perfect, completely aligned and really strong. Already I am noticing changes in my body and I can't wait to get over my injury and start running again as a much stronger athlete".

Nick Gasson, Team manager, Blackheath & Bromley Harriers.

Joseph Mills is a former G.B. and Welsh international. He is a member of Blackheath and Bromley Harriers and the BMC. He is a registered Body Control Pilates Teacher. You can contact him at athleticpilates@yahoo.co.uk or 07734 944794.

BMC interview

by David Lowes

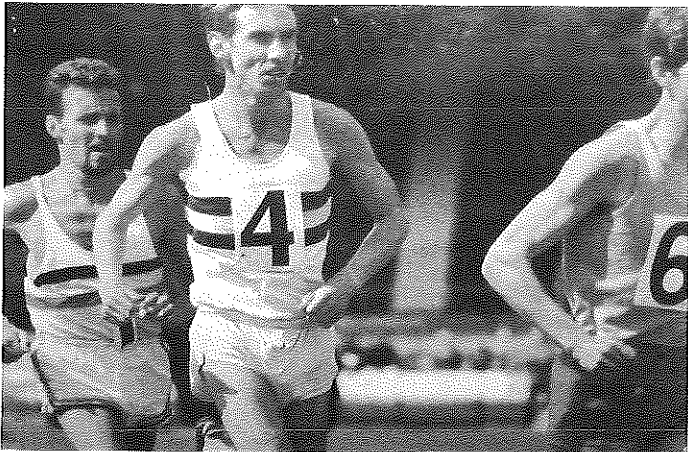
Interview with Member No.1 and Member No. 5000

The BMC's first affiliated member was Hugh Barrow in 1963 and it's taken 43 years to reach the milestone of Member No. 5000 with Zofia Okuniewska. World records have changed dramatically since 1963 as has lifestyles and attitudes, but one thing stays the same, the BMC is committed to raising the standards of middle distance running in the UK.

Back in 1963 you could buy a gallon of petrol for 2s/6d (that's 12p to those not old enough to remember!). You could also buy a brand new car to put the fuel in for around £700, while a home would cost around £6,000 and you could expect to take home £10 a week in wages if you were lucky!

The following are the interviews carried out by Academy Chairman, David Lowes between Hugh and Zofia and they give an insight into the differences between now (2007) and then (1963).

Hugh Barrow: Member No.1



Age: 62. Started running at 13 (but never remember when I didn't run).

Clubs: Victoria Park AAC; Wallasey AC; Belgrave Harriers; Sale Harriers.

PBs: 100yds 10.6; 220 yds 24.0; 440 yds 51.0; 880 yds 1.50.3; 1 mile 3.0.5; 1500m 3.45.4; 1 mile 4.01.0; 2000 metres 5.16.6; 2miles 8.51.4; 3 miles 13.52.8.

Titles: Scottish Boys CC Champion 1960; Scottish Youths 880 yds Champion 1960, 1961; Scottish Junior 880 yds Champion 1962, 1963; Scottish Schools Mile Champion 1960, 1961, 1962; AAA Junior 880 yds runner-up 1962; AAA Junior 1 Mile Champion 1963; British Schools 1 mile 1961, 1962; Scottish 1 mile Championship runner-up 1965, 1967; Scottish 1500metre Championship runner-up 1969.

Coaches: John Stirling, Victoria Park; John Anderson; Eddie Powell, Sale Harriers.

How did the BMC begin?

In 1963 the state of British miling was at a low ebb following the Bannister/ Hewson/Ibbotson era. Frank Horwill wrote to various athletic journals and there was a response from 35 athletes and the club was born. It is detailed in Frank's book, 'Obsession for Running'.

What constituted leisure time for you in 1963?

I was always interested in sport in general and at that time I was still playing rugby, a sport that I am still involved with today. We also went to the cinema and in the prehistoric days before even disco's we went to beat group dances.

What about running wear in those days?

This was the very early days of Adidas and Puma who were fighting it out for the running-market. Before that it was just Fosters who then went on to become Reebok who invented the ripple sole (for cross country) which pre-dated the Nike waffle sole. Running vests and shorts were cotton, lycra and dri-fit garments weren't even in the embryonic stage. Cotton tracksuits were eventually taken over by Bri Nyon and goretex was light years away. So if it rained you basically got very wet and ran with soggy, heavy clothing. We may have worn a kagool when it was pouring with rain, but they made you sweat a lot and weren't breathable and in fact weren't even waterproof, showerproof at best! My own club Victoria Park at that time were dominant in Scotland and also could take on the top English clubs (they had even won the English Cross Country team title, the first time it had left England) and they even had a cobbler who would come down and take measurements for hand-made spikes. Trendy tracksuits were in their infancy with such makes as Copdale, Umbro and Bukta. Ron Hill was starting out to experiment with string running vests and cutaway shorts. We timed our steady runs by an analogue wrist watch, so if we went out running at 6.15pm and returned at 7.08pm that was approximately a 53 minute run. Track sessions were done

with an analogue stopwatch which wasn't as easy to read as today's digital watches but were just as accurate.

What sort of training were you doing at Zofia's age (17) and what frequency per week?

It was always quality before quantity. I trained six days per week, twice a day Monday-Friday. This was made up of interval work, hill reps and steady runs. Mileage was probably about 50 miles per week and I even did some weight training.

Were you a cross country man or a track man or were you happy on either surface?

I did track, road and cross country but preferred track/road. I did a lot of cross country and the cross country trails included barbed wire fences and five-barred gates. The only time I can remember a cross country race being called off was not due to the weather but during a foot and mouth epidemic.

Availability of transport was not as it is today or the road infrastructure as accessible, so how did you travel to races which were large distances away?

Strange but public transport was probably better in some ways. I travelled to races by train or bus and never really encountered any problems. Then some club members got cars and we shared costs and drove to races in England on a regular basis. It obviously took much longer than today, but we thought the transport at the time was more than adequate as there was nothing better.

The world records were 1-46, 3-35 for men and 2-01, 4-12 for women in 1963. Did you think they would be where they are today and where do you think they will be in say, 20 years time?

Irrespective of how good you are there is always somebody coming down that road behind you who will do better. It's just the way it is. I'm not really surprised by the improvements, especially with the influence of the African dominance with the Kenyans and Ethiopians and other north African countries. I assume that progress will continue, but I think the advancement of the world records may well slow down.

Let's compare facilities in 1963 and now. Did they hinder you or make you more determined to succeed no matter what it took. Obviously you accepted what you had and made the best of it. Are facilities necessary for middle and long distance. (Tartan tracks etc.)?

I don't think not having tartan tracks hindered us, in fact it may even have prevented some of the stress related injuries of today i.e stress fractures, Achilles injuries etc. I'm not convinced if sophisticated facilities are required for middle

distance runners. Running is a natural activity and as long as you have roads, paths, grass and hills all you need to do is just to get on with it and stop bemoaning lack of high-tech facilities. I agree that you do need to measure progress, but sometimes lack of facilities is a spur to drive you on. Many great sportsmen over the year's have succeeded because they had to overcome obstacles such as this and it has helped to mould them into better people. A lot of the Africans haven't got state-of-the-facilities, but they have got great natural environments and fantastic mental toughness, nothing fazes them.

Some of the races you competed in were held in the half-time interval of soccer matches, can you tell me what it was like?

I was indeed lucky enough to compete in front of some enormous crowds. Rangers F.C. at that time promoted athletics meetings when they brought some of the best athletes in the world to compete at Ibrox, just like a major grand prix meeting today. I even ran in mile races at half time during the Old Firm matches between Rangers and Celtic, the atmosphere was incredible. I also ran at Hampden Park in a 1 Mile International event before the Scotland v England match and there were 129,000 in the stadium. The contribution that soccer made to the promotion of athletics in Scotland at that time is now a forgotten chapter.

Do you think youngsters are being developed the way they should. What about present leisure time pursuits of youngsters (computers, music etc.)

I don't like the approach of 'it was always better in our day' and for many older athletes they tend to get very selective about what they remember. It's a different era now and dissimilar challenges face our young athletes. In athletics the watch has stopped and the unforgiving minute has been read and recorded so times tell their own story. There does seem to have been little progress from the Cram/Coe/Ovett era. but that was a special time, a 'purple patch' and that type of thing only happens every so often in sport. We were probably much naturally fitter in some respects by being used to walking/running or cycling much more than today and that gave us a base of general fitness to build upon. But we should not knock young people because there are those who still want to succeed and we should encourage them.

Were you a mileage man or a speed man or a bit of both?

A bit of both, but never really a high mileage man.

Did you have an athletic hero who inspired you around 1963?

No contest, Herb Elliott from Australia who remained undefeated throughout his career over 1500 metres.

Zofia Okuniewska: Member No.5000

Is there any special race that you can remember that inspired you?

The 1960 Olympic Games in Rome and the men's 1500 metres where Herb Elliott totally destroyed the field winning by about 3 seconds and in a new world record time. Also his double victories over 880 yards and 1 mile at the 1958 Empire Games in Cardiff.

Do you think you reached your athletic limit (i.e. got the best out of yourself)?

No, I set a World Age 16 year old best for the 1 mile at Santry Stadium Dublin in 1961 with 4.10.9 and that became a bit of an albatross for me. I did reach 4.01.0, but I had always wanted to be the first Scot to break 4 minutes. You can always find excuses, injuries etc. but I just didn't reach the goal I had set myself, end of message!

Did you go to university and how did that affect your athletic progress?

No, I didn't go at that point, but I did go later when I attended teacher training at Didsbury College. Manchester. I was running Sale Harriers (1967-70) at that time.

When you started working did that affect your athletic progress?

I started working in an insurance office and I trained during my lunch hour. It had to be quality work as there wasn't sufficient time for anything else.

Who do you admire in athletics today?

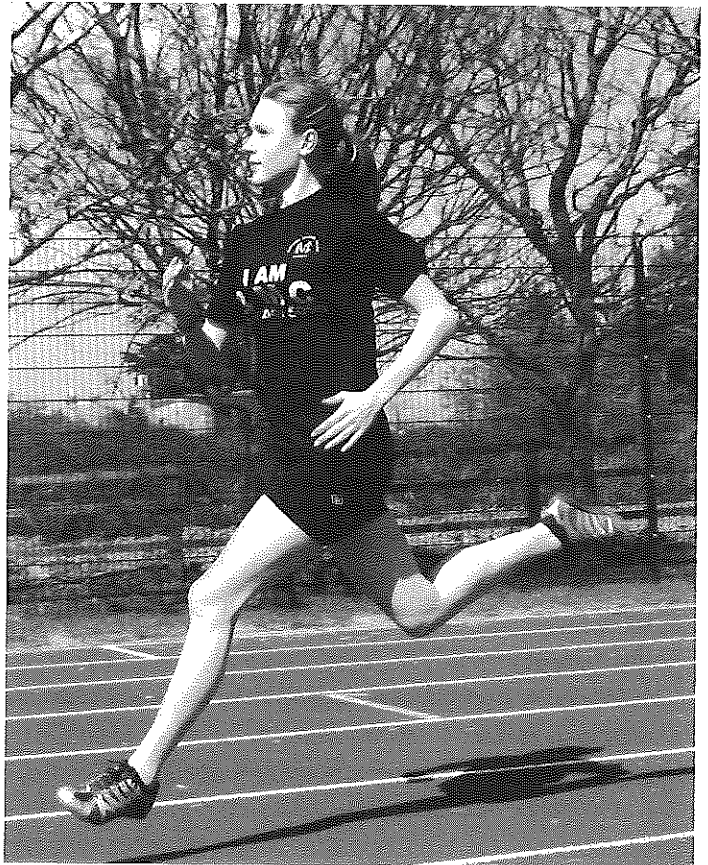
Paula Radcliffe.

What about the state of athletics in this country. Is there any hope and what have we got to do?

There is always hope, we have done it in the past in the Bannister/Chataway/ Ibbotson era and in the Ovett/Coe/Cram/Elliott period. That same talent has to be out there somewhere, all we have to do is find it and nurture it and also change our lifestyles dramatically.

What do you think about the state of the BMC at the present time. It still has the same values, but does much more now than it ever did?

I am not really qualified to comment on that as I am no longer actively involved in the club. I did help organise some training weekends with Frank Horwill about 10 years ago and the spirit was still burning then and I'm sure that is still the same today going by the sell-out numbers attending the courses you organise.



At one of our national 3 day courses in November 2006 at Irthlingborough, Northamptonshire, Zofia Okuniewska from Wellington, near Taunton, asked for a membership form to join the BMC Academy. Little did she know at the time what a wise and worthwhile decision that would turn out to be! She became member number 5000, and the BMC decided to make her a special case for that elusive number. The perks that she received were: Free BMC 1 year's subscription; Free BMC course of her choice plus a free course for her coach; Free BMC personalised member 5000 t-shirt and hooded top plus Academy cap; Free BMC Diary; Free BMC Academy Vest; Free Nike spikes; local and national media publicity. Zofia is by no means an elite athlete yet, but she is learning the sport and has ambitions to reach the highest level and enjoys gaining knowledge and learning new ideas and this is why she rates the BMC so highly.

Age: 17, d.o.b. 31/05/89.

Clubs: Taunton AC.

PBs: 800m 2.18.0; 1500m 5.03.0.

Coach: Charlotte Fisher.

You have an interesting name, what are the origins?

My name is Polish, my (Polish) grandparents came to

England because of the Second World War, they settled in Leicester and my parents came to Taunton after they met.

When did you start running and why?

I started running quite late, not until school year 9. I ran for my school at sports days and small competitions and my P.E. teacher suggested that I went along to the local athletics club which was Taunton A.C.

What sort of goals have you set yourself if any?

Short-term: to get an 800 pb in 2007 and hopefully national entry. Medium-term: I haven't really got a medium term goal other than to train with the university regularly and get the most benefit out of that. Long-term: to keep running and enjoying it, and then I'll see where that takes me!

What does a training week look like at the moment?

A week in the winter would comprise of something like this:

Monday	Strength and Conditioning work
Tuesday	Steady run with college
Wednesday	Club night training - either hillwork or intervals on the track
Thursday	Steady run with college
Friday	Rest day
Weekend	Intervals on grass/hillwork/running on sand or XC race

The summer training would be along the lines of the following:

Monday	Strength and Conditioning work
Tuesday	Club night track session - fast work
Wednesday	College training - steady run
Thursday	Club night grass session - longer work
Friday	Rest day
Saturday	Technical/speed work
Sunday	Competition

Interests outside athletics?

Spending time with my friends, parties, shopping, cinema, reading, college, music/gigs, going to the beach!

Most pleasing performance so far?

Probably the South West 800m race last track season at Exeter. I enjoyed the race knowing that there were lots of really good people in it. I felt relaxed and ended up with a pb which made it very satisfying!

What about the BMC?

The BMC perks have been really good, the jumper is my new favourite jumper! I love the vest and it's really nice to run in. I'm looking forward to more training weekend's and being an Academy member, everyone will be getting free spikes as part of a deal with their sponsors Nike. It was really interesting meeting Frank Horwill, the founder of the BMC in Bristol for publicity photograph's last year. The BMC training diary has been really useful as I was finding it quite hard to stick to one before. I love the BMC! The people are great, the perks are great and there's great opportunities in training and races.

What about education?

Academically I want to get good A level results (A's) and go to university to do dual honours English and History, but after that, I haven't a clue!

Favourite athlete?

Kelly Holmes.

Favourite person?

Not sure, probably either Alice Walker, novelist, essayist and poem writer or George Orwell, novelist, critic and cultural commentator.

Favourite distance?

800m at the moment.

Favourite session?

Mainly the summer work, so probably 150m fast with walk back recoveries (x6) or 300m reps with a good recovery!

Least favourite session?

Lots of really long and steep hills!

In it to win it!

by Gareth Evans

A study of 800m race tactics and Notational Analysis

If watching the recent European Indoor Championships has whetted your appetite to get out on the track and race again you are probably itching for the summer season to get started and to bring home record medal totals just like our successful GB Indoor team. But have you thought of exactly how you are going to do that?

Sports Science support is recognised by nearly all sports as a vital tool in ensuring athletes reach their maximum potential. Athletics is certainly no exception.

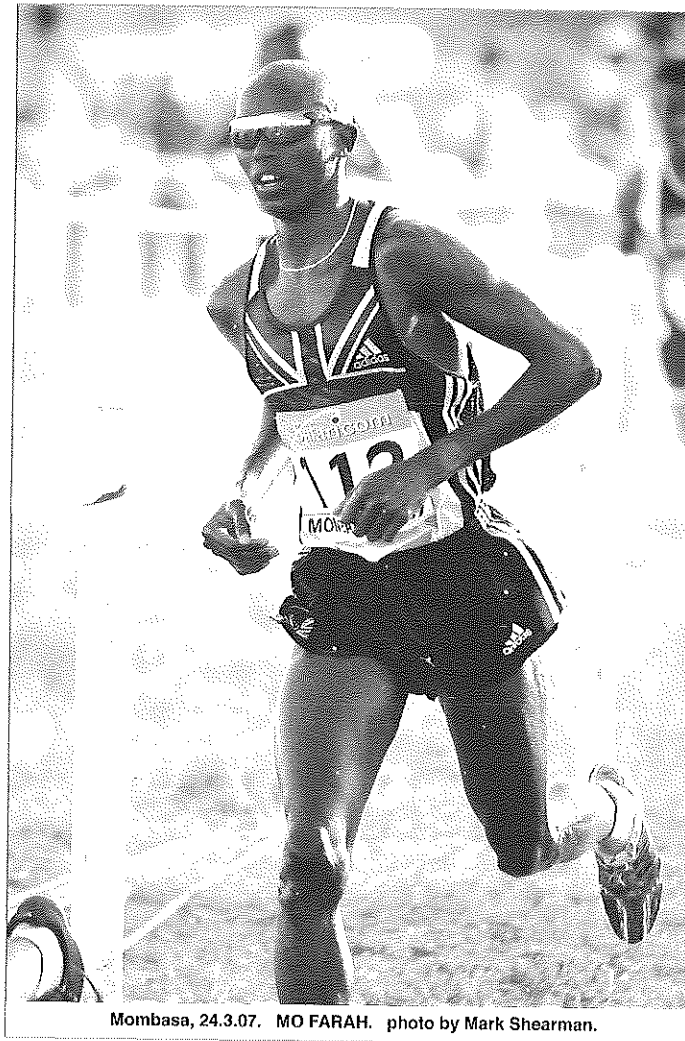
However, most scientific research in Athletics is carried out within areas such as Biomechanics of movement, Nutrition, Psychology or Physiology. Whilst these are also common in other sports there is a fairly large hole that Track Athletics seems to overlook - Notational Analysis. Take Football for example, and it is an integral part of a top-flight club. Indeed, even local amateur clubs are now using many tactical analysis systems.

The results can give vital evidence and information to a coach and athlete to justify tactics and training methods. It should be applied to Athletics as well. If there was ever a sport where performers craved that extra edge over their rivals or to know their training was working effectively, athletics is it!

If you are a middle-distance runner and toy with whether to run hard from the

gun, pick it up from the bell or hold something back for a final kick then think how important it would be to know the most effective method in order to win.

At one of the leading institutions in the world for Performance Analysis, The University of Wales, Institute Cardiff (UWIC), a system was designed to



Mombasa, 24.3.07. MO FARAH. photo by Mark Shearman.

allow analysis of track athletics, and in particular middle-distance running. Two key elements were examined, the speed athletes ran at and the positions they took up during a race.

The study looked at 800m Olympic Games races, covering heats and finals, and a selection of Grand Prix and Invitational meetings. The research was carried out using a notational system

that analysed athletes' positions and velocities at every 100 metres. The following significant findings were made:

It was found that the first 200 metres were significantly faster than the rest of the race in all cases as athletes attempted to gain positional advantages over the rest of the field, and for the

final 600 metres the mean velocity differences were small. However, it was interesting to note that the final 200 and 100 metres were not significantly faster than any other section of a race despite what may be expected. Where it may appear a competitor is sprinting home, in fact more often they are not running quicker due to either fatigue or sometimes easing down when safely qualified within a heat.

The first lap was mostly run faster than the second as athletes jostled for positions and tried to prevent getting boxed in.

An athlete must remain in contention throughout the race in order to win, though he may drop off the leading pack if he is in a race of lower standard than his own and is able to catch up the gap.

An athlete produces similar profiles for different races, though the velocity scores may be higher or lower depending on the quality of the race. For example, 800m legend Johnny Gray exhibits a front running ability, but fades at the end of race, but Vebjoern Rodahl stays close to the leader,

typically in second or third place, before moving into the lead at 700 metres and producing a sprint finish.

The heats of the Olympics are run slower than the semi-finals, which in turn are run slower than the final. The athletes speed up for the penultimate 100 metres in order to be able to ease down through the final straight having secured qualification. In the semi-finals the competition is tougher and the pace picks up with 200 metres remaining and increases again for the last 100 metres to guarantee qualification. The final is a very fast race with the athletes becoming tired and slowing in the home straight.

The Grand Prix and Invitational Meetings followed the same pattern as the Olympic heats but were quicker, indicating that the drop in velocity over the last 100 metres was due to fatigue and not easing down.

The winning athlete was in 96% of the races in the top 4 with 200 metres remaining and the first three with 100 metres left. The positions before these points were found to be less important, providing the athlete remain in close proximity of the leader or leading group. Individual athletes also often produced repeatable profiles.

The results meant that there was no

significant position to be in until 200m out. Once you hit the home straight if you were not in the first 3 or better you may as well hand over the Gold to your competitors and save yourself the lactic build up of a sprint finish!

So, next time you line up at your local club championships, a BMC meet, County Championships or even an International event, will you have the edge?

Gareth Evans

*BA (Hons) Sport & Human Movement, PGCE
Athletics Club Coach, UEFA 'B' Licence
Lecturer in Sport at Myerscough College,
Preston, Lancashire.*

Book review

A Fighter Second to None: Roy Fowler of Leek and his World of Running. By John Bale and Malcolm Henson, published by North Staffordshire Press, The Business Village Stoke, 72 Leek Road, S-O-T. ST4 2AR cost £9.95

This is a bio of an original "Alf Tupper" like character. A man who, like many, started as a middle-distance man, but who shone as a longer distance man. Overcoming many obstacles he was a Euro C_C champion, Euro 10k third placer, Commonwealth six mile record setter. As a

painter and decorator training was carried out both before and after a day working on his feet. The book explains how it was and questions if to-days "stars" have the same application. His best 6 miles was 27:24.8 (28:24 for 10k?) and how would we welcome such a figure to-day? One his many problems was the loss of his teeth when young...resulting in unusual photos being shot whilst racing. This a book for those who would learn of the past and for those who want to remind themselves of it.



Sunderland, 10.3.07. Start of the senior men's race. photo by Mark Shearman.

The 800m examined

by David Lowes

David Lowes takes a detailed look at the two lap event, how it has progressed, the demands it makes on athletes and the training required to meet them.

The final article in my series of middle and long distance events which has covered the 1500m, 5000m, 10000m, half marathon and marathon is the 800m.

It is perhaps one of the most exciting and physical middle distances races and requires an athlete who is immensely strong, fast and who can tolerate lactate accumulation better than their rivals. There are basically two kinds of 800m runners; those who are 800m/1500m types and those who are 800m/400m types. The 800m/1500m athletes are the most common with the 800m/400m athletes being a rarity.

For those with aspirations of reaching the highest level their make-up obviously needs all of the aforementioned qualities to succeed. However, if speed is not in abundance then successes will be rare.

For male athletes who consider themselves elite or capable of winning major titles they will need to have a cruising speed of around 48-49 seconds for 400m. This will allow them to ease through the bell in a race with plenty in reserve whether at that pace or slower. If the bell is reached in 53 seconds and the athlete is beginning to struggle, then the final 400m is going to be an effort with a pronounced slowing down to the finish line.

The 800m runner therefore needs great strength capabilities which will be gained through running sessions, but also attained with strenuous gym work-outs that will include weight training, circuit training and core stability work.

To run well at 800m, the athlete will have to be powerful and generally have good flexibility. The power will be delivered through elastic strength and these athletes are normally very good at running drills and bounding in particular and also excel at hill running. The flexibility is needed through a greater range of movement caused by the velocity at which the event is run.

Strength is required not only in the legs but in the arms as well, as these are the prime movers when tiredness occurs in the last 200m and the major factors that make the legs move fast.

The 800m can actually be termed an 'extended sprint' and anyone that is capable of 1-41.11(WR) will realise that is

the case. In theory, those with very fast 400m times should be capable of running good 800m races, in reality this is very rarely the case due to the lack of endurance they possess and their physiological make-ups (amount of FT and ST fibres).

Training for the event requires much speed (400m pace) training, along with strength training (1500m and some 3000m paces). Work over 200m at maximum pace and faster than race pace with short recoveries will be crucial sessions to ensure success.

Winning margins

If you can't sprint really fast then you are not going to win many major races. Looking at the Olympic Games winning margins over the years shows why it is vital to be able to 'kick' at the end of a race and also hold form better than your rivals.

Men			
Year	Athlete	Winning Time	Times of 2nd & 3rd behind winner
1896	Edwin Flack (AUS)	2-11.00	(0.8/17.0)
1900	Alfred Tysoe (GBR)	2-01.20	(0.6/1.8)
1904	James Lightbody (USA)	1-56.00	(0.3/0.4)
1906	Paul Pilgrim (USA)	2-01.50	(0.6/1.5)
1908	Mel Sheppard (USA)	1-52.80	(1.4/2.4)
1912	Ted Meredith (USA)	1-51.90	(0.1/0.1)
1920	Albert Hill (GBR)	1-53.40	(0.2/0.6)
1924	Douglas Lowe (GBR)	1-52.40	(0.2/0.6)
1928	Douglas Lowe (GBR)	1-51.80	(1.0/1.4)
1932	Tommy Hampson (GBR)	1-49.70	(0.2/0.8)
1936	John Woodruff (USA)	1-52.90	(0.4/0.7)
1948	Mal Whitfield (USA)	1-49.20	(0.3/0.6)
1952	Mal Whitfield (USA)	1-49.34	(0.29/0.44)
1956	Tom Courtney (USA)	1-47.75	(0.13/0.50)
1960	Peter Snell (NZL)	1-46.48	(0.27/0.77)
1964	Peter Snell (NZL)	1-45.10	(0.5/0.8)
1968	Ralph Doubell (AUS)	1-44.40	(0.17/1.06)
1972	Dave Wottle (USA)	1-45.86	(0.03/0.15)
1976	Alberto Juantorena (CUB)	1-43.50	(0.36/0.62)
1980	Steve Ovett (GBR)	1-45.40	(0.45/0.54)
1984	Joachim Cruz (BRA)	1-43.00	(0.64/0.83)
1988	Paul Ereng (KEN)	1-43.45	(0.45/0.61)
1992	William Tanui (KEN)	1-43.66	(0.04/0.31)
1996	Vebjørn Rodal (NOR)	1-42.58	(0.16/0.21)
2000	Nils Schumann (GER)	1-45.08	(0.06/0.08)

Studying the winning margins of every Olympic final shows beyond doubt that speed, strength and lactate tolerance qualities are paramount for an 800m specialist. The bizarre 1896 final was won by Edwin Flack from Nandor Dani by 0.8 seconds with the third athlete, Dimitrios Golemis almost 17 seconds behind (I presume he must have fallen or jogged in last?)

The margins between gold and bronze from the above table show how close most championship finals are. Winning distances are usually much less than 0.5 second with a similar timescale to third place. Therefore, if you are going into an Olympic 800m final, expect to win by less than 3 metres at best and in some cases make sure you have practised your dip on the line to perfection!

Women

Year	Athlete	Winning Time	Times of 2nd & 3rd behind winner
1928	Lina Radke (GER)	2-16.80	(0.8/1.0)
1960	Lyudmila Shevtsova (URS)	2-04.50	(0.08/0.73)
1964	Ann Packer (GBR)	2-01.10	(0.8/1.7)
1968	Madeline Manning (USA)	2-00.92	(1.66/1.71)
1972	Hildegard Falck (GER)	1-58.55	(0.10/0.64)
1976	Tatyana Kazankina (URS)	1-54.94	(0.48/0.66)
1980	Nadyezhda Olizarenko (URS)	1-53.43	(1.38/2.03)
1984	Doina Melinte (ROM)	1-57.60	(1.03/1.23)
1988	Sigrun Wodars (GDR)	1-56.10	(0.54/0.81)
1992	Ellen van Langen (NED)	1-55.54	(0.45/1.26)
1996	Svetlana Masterkova (RUS)	1-57.73	(0.38/0.98)
2000	Maria Mutola (MOZ)	1-56.15	(0.49/0.65)

The women's medal margins are generally greater than the men's, but still close enough to warrant a fast finish to ensure victory. The last four Olympic Games finals have been won with around 0.5 seconds of daylight to spare. The distance between first and third in every Olympic final since 1960-2000 has been substantial (0.64-2.03 seconds) which indicates the superiority of the champions over the rest of the field.

Tactics

Every race over whatever distance needs a good tactical brain to deliver the desired result through being in the right place at the right time. Also running as economically as possible is vital to conserve energy which allows you to unleash the final push for the line.

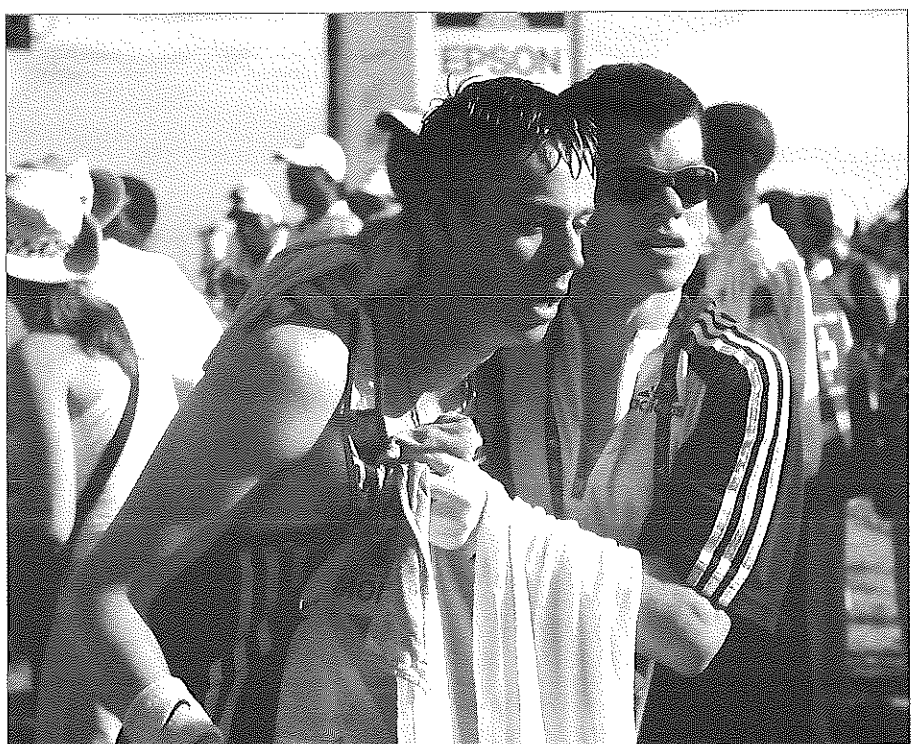
The 800m is perhaps the most difficult and most important race in terms of tactics where one slip in concentration can lead to an inferior performance. Physical contact is quite common in two lap races and these malaises cannot be allowed to interfere with the application of an athletes' competitive delivery.

Because of the danger of collisions at the beginning of a race, the athletes run the first bend in lanes before breaking for the inside lane down the back straight. However, even this can cause problems with the athletes regrouping at around the 200m distance with everyone vying for the inside lane. The first 200m is usually the fastest of the race.

Athletes that cut in too soon, especially from the mid to outside lanes, not only run further than they need to, but also endanger themselves and other athletes by getting caught up in heavy traffic. Tripping, collisions and loss of rhythm are a common occurrence in 800m races and some of these need to be reluctantly accepted to succeed.

There was an experiment in the mid 1970's when the athletes ran the first 300m in lanes. This was to alleviate the above problems and to make races faster. The 1976 Olympic Games which was won by 'White Lightning' Alberto Juantorena of Cuba was the one and only time it was used at the Games.

The men's world record of 1-41.11 by Wilson Kipketer (Denmark via Kenya) was set in the summer of 1997 and is around 11 seconds faster than Melvin Shepherd (USA) ran almost a century ago. This equates to around a 90m



Mombasa, 24.3.07. LEE CAREY is helped by DR. NOEL POLLOCK at the end of the junior men's race. photo by Mark Shearman.

improvement and since Seb Coe first broke Juantorena's world record in 1979 it has only been held by two athletes (Coe, twice and Kipkeeter, three times) in the last 25 years.

The first athlete to break the 1-50 barrier was Britain's Thomas Hampson with 1-49.80 in 1932 and 1-45 was broken for the first time by New Zealand's Peter Snell, thirty years later in 1962. Sebastian Coe took the record to new heights in 1979 with 1-42.33 before improving it in 1981 with an unbelievable run of 1-41.73 which was to stand for 16 years.

Wilson Kipkeeter first of all equalled that record in July 1997, then in the space of 7 weeks broke it again, twice! The record still stands, and at present (2004) no-one has challenged it.

The women's world record of 1-53.28 by Jarmila Kratochvilova (Czechoslovakia) was set in the summer of 1983 and is around 23 seconds faster than Lina Batschauer-Radke from Germany ran in the 1928 Olympic Games, when the event was not taken too seriously. In fact, the event was deemed unsuitable and dangerous for the health of females

in those days! It was not held at that level again for another 32 years until the Rome Olympics in 1960. Many people feel that Kratochvilova's world record was achieved through dubious means. It is now 21 years since she performed that feat, yet no one ever questioned Seb Coe's achievements. Perhaps with her great strength and 400m speed she was ideally suited to the event and no one else has come close with any of those attributes?

The Olympic Games have produced some memorable races and some which have impressed myself are: 1964 - Peter Snell winning with such strength and poise; 1968 - Ralph Doubell winning in a world record time; 1972 - Dave Wottle coming from nowhere to win wearing his trademark baseball cap; 1976 - the great Alberto Juantorena, the last person to win the double (400m/800m) and claim gold in a world record time; perhaps the most memorable from a British point of view was the 1980 final where Steve Ovett claimed an unexpected, but thoroughly deserved victory with Seb Coe running a tactically inept race; 1984 - the exciting and naturally talented Brazilian, Joaquim Cruz beating Seb Coe comfortably; 1996 - Vebjørn Rodal from Norway, winning in an Olympic record of 1-42.56, with silver and bronze also under 1-43.00.

The women's races have also produced many exciting races and some of the most outstanding have been: 1964 - Ann Packer winning convincingly after a somewhat disappointing silver in the 400m; 1972 - Hildegard Falck winning in a

time just outside her own world record, with the other two medallists under two minutes; 1976 - Tatyana Kazankina winning in a world record 1-54.94 and completing the 800m/1500m double; 1988 - Sigrun Wodars, claiming the gold medal in 1-56.10 with the other two women also under 1-57.0; 1992 - Ellen van Langen, unexpectedly victorious, but her winning time was a world-class 1-55.54; 1996 - Svetlana Masterkova, the master tactician and the last person to complete the 800m/1500m double.

Statistics

There are some fascinating statistics relating to the 800m and some of these are as follows:

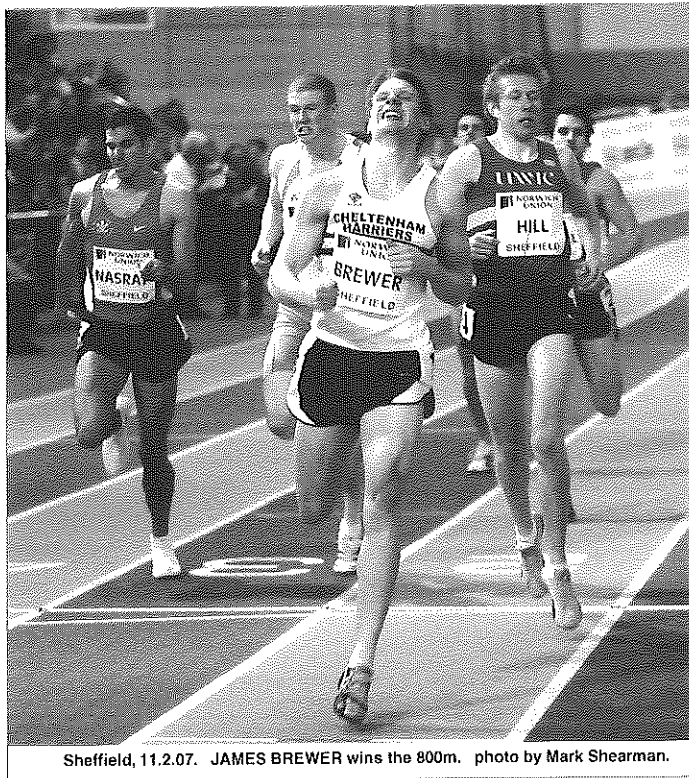
- Only one man has held the 800m/1500m world record - Sebastian Coe (1-42.33 - 1979); (1-41.73 - 1981); 3-32.03 (1979).
- Three men have held the 400m/800m world record - James Meredith (47.4 - 1916); (1-51.9 - 1912). Benjamin Eastman (46.4 - 1932); (1-49.8 - 1934). Rudolf Harbig (46.0 - 1939); (1-46.6 - 1939).
- Two men have done the Olympic Games 400m/800m double (Paul Pilgrim, 1906 and Alberto Juantorena 1976).
- Only one woman has held the 400m/800m world record - Jarmila Kratochvilova (47.99 - 1983); (1-53.28 - 1983).
- Three women have held the 800m/1500m world record - Jevdokia Vasiljeva (4-47.2 - 1936); (4-45.2 - 1937); (4-38.0 - 1944); (2-13.0 - 1950). Nina Pletneva (2-12.0 - 1951); (4-37.0 - 1952). Tatyana Kazankina (1-54.9 - 1976); (3-56.0 - 1976); (3-55.0 - (1980); (3-52.47 - 1980).
- No woman has ever won the 400m/800m double at the Olympic Games.
- Two women have done the Olympic Games 800m/1500m double (Tatyana Kazankina, 1976 and Svetlana Masterkova, 1996).

These facts suggest that the 800m is very much a specialist event with specific attributes needed to be successful at running two laps of the track. Successful 400m runners who excel at 800m are uncommon, however, those who shine at 800m have a better chance of success at the metric mile.

Every event has its own requirements and there are many different athletes who have similar times over 800m, but very dissimilar 400m and 1500m times and abilities and some may even be good cross country runners.

Britain's golden era

If we take a look at our 'golden era' with Coe, Cram, Ovett, Elliott and McKean, they all had world-class times and on their day in a particular kind of race were almost unbeatable,



Sheffield, 11.2.07. JAMES BREWER wins the 800m. photo by Mark Shearman.

but they were all very different types in relation to training and racing tactics.

Sebastian Coe was the world record holder on two occasions at 800m, once at 1500m, three times at one mile and also Olympic champion at 1500m twice and runner-up at 800m on two occasions. He also won European gold at 800m and broke the 1000m world record. At his best, he had the ability to run equally well whether the pace was fast or slow and had pb's of 46.87 for 400m, 1-41.73 for 800m, 2-12.18 for 1000m and 3-32.03 for 1500m.

Steve Cram was world record holder at 1500m, 1 mile and 2000m and won gold at World, European and did a Commonwealth double over 800m and 1500m. He ran 1-42.88 for 800m which still ranks high up on the all-time rankings, and was primarily a 1500m specialist with great versatility from 800m up to 5000m (13.28.58). His 400m time (49.1) was poor for an athlete of his calibre. He was also Olympic 1500m silver medallist in 1984 and bronze medallist over 800m in the 1986 European championships.

Steve Ovett won Olympic gold in 1980 in Moscow in an epic final when no-one expected him to do so, expect himself. He came to prominence as a masterful 800m tactician with incredible bursts of speed at around 200m to go, which left the opposition floundering in a very short space of time. Times were never his major goal, with winning the most important aspect. However, he held the world 1500m and mile records twice and also the world best for 2 miles. He had a best of 1-44.09 and his 400m best was 47.5 seconds. Like Cram, he had great endurance and won

Commonwealth gold at 5000m in 13-20.06, along with a European 1500m gold medal.

Peter Elliott was a prolific racer, running more races in a season than many athletes did over two or three years. In one season he ran 36 races, which for most would spell disaster. He won a World championship silver in 1987 and an Olympic silver over 1500m in 1988. At the commonwealth Games in 1986 he won bronze and in 1990 finally captured gold in the 1500m. He had pb's of 1-42.97 and 3-32.69 and like Ovett he had a 400m pb of 47.5 seconds.

Tom McKean was probably one of the best 800m runners we have had when the bell was reached in 53 seconds or slower. His searing speed and strength over the last 100m-150m won him many races in style. His best of 1-43.88 was set in 1989 and among his successes were European gold and silver medals in 1990 and 1986; a European indoor gold in 1990 and a World indoor gold in 1993. He also won four Europa Cup titles.

Equivalencies

Wilson Kipketer's world record of 1-41.11 equates to two equal laps of 50.55 seconds. Therefore, anyone with aspirations of running that quickly needs to be capable of running 48.5-49.0 seconds at a canter and that means having a 400m pb of at least 47 seconds and probably much faster.

Equating the world record to comparable training sessions looks like this: 1 x 600m = 75.83 + 1 x 200m = 25.27; 2 x 400m = 50.55 seconds; 4 x 200m = 25.27 seconds; 8 x 100m = 12.63 – all with no recoveries!

If the first 200m is the fastest of the race then the athlete running at world record pace will be going through that mark in sub-24 seconds and that has to be very relaxed and easy. This is why it is sometimes classed as an extended sprint, the athlete must have great physical strength and lactate tolerance, but very quick legs as well.

The athlete who holds their form the best and doesn't succumb when it gets really tough - around 600m - and can pick up the pace and sustain it down the home straight will invariably be successful.

Obviously there are not many 800m races ran at world record pace and some can be very tactical, with it basically coming down to a 400m race after a slow first 400m. This is where strength and speed qualities are finely matched along with good tactical positioning. Being boxed in or running wide when someone kicks hard usually loses you

the race, there isn't any room for error over two laps, one mistake can be costly. Great spatial awareness is essential, when someone makes a move on your outside, you must be able to respond immediately. These manoeuvres must be practised regularly in training, surprise tactics by opponents must be expected and dealt with appropriately.

Jarmila Kratochvilova's 1-53.28 from 1983, whether suspicious or not, was down to her great strength through a 'sprinter's physique' and her 400m speed. The record equates to two even paced laps of 56.64 seconds and put into world record paced training sessions they look like this:

1 x 600m = 84.96 +

1 x 200m = 28.32; 2 x 400m = 56.64 seconds;

4 x 200m = 28.32 seconds; 8 x 100m = 14.16 -

no recoveries allowed!

When she set this record there was only 1.1 seconds difference per 400m (56.1/57.2), which is extremely even paced and economical running, which in turn delays the onset of rapidly increasing lactate accumulation. Seb Coe had a differential of 2.4 seconds (49.7/52.1) when running his world record 1-41.73. Therefore, if your target is 2 minutes, a 55 second first lap is not the smartest way to do it - 57.5 - 58.0 seconds however, would give you an excellent chance.

Progression

Looking at the evolution of the men's world record since 1908, shows how it has progressed. In most cases, it has improved steadily with changes in personnel every 1-4 years. However there have been many instances where the record has remained stagnant for many years.

Such instances are James Meredith (14 years); Rudolf Harbig (16 years); Roger Moens (7 years); Peter Snell (6 years); Seb Coe (16 years); Wilson Kipketer (7 years, thus far).

Men

1-52.80	Melvin E. Shepherd (USA)	21/07/08
1-51.90	James E. Meredith (USA)	08/07/12
1-51.60	Otto Peltzer (GER)	03/07/26
1-50.60	Sera Martin (FRA)	14/07/28
1-49.80	Thomas Hampson (GBR)	02/08/32
1-49.80	Benjamin Eastman (USA)	16/06/34
1-49.70	Glenn Cunningham (USA)	20/08/36
1-49.60	Elroy Robinson (USA)	11/07/37
1-48.40	Sydney Wooderson (GBR)	20/08/38
1-46.60	Rudolf Harbig (GER)	15/07/39
1-45.70	Roger Moens (BEL)	03/08/55
1-44.30	Peter Snell (NZL)	03/02/62

1-44.30	Ralph Doubell (AUS)	15/10/68
1-44.30	David Wottle (USA)	01/07/72
1-43.70	Marcello Fiasconaro (ITA)	27/06/73
1-43.50	Alberto Juantorena (CUB)	25/07/76
1-43.44	Alberto Juantorena (CUB)	21/08/77
1-42.33	Sebastian Coe (GBR)	05/07/79
1-41.73	Sebastian Coe (GBR)	10/06/81
1-41.73	Wilson Kipketer (DEN)	07/07/97
1-41.24	Wilson Kipketer (DEN)	13/08/97
1-41.11	Wilson Kipketer (DEN)	24/08/97

Running 800m like all events, produces the best results when it is run at even pace. This rarely happens, with the first 200m usually being the fastest and the third 200m the slowest. Athletes like Dave Wottle, the 1972 Munich Olympic champion and world record holder seemed to be running too slowly on the first lap, being well behind the field at the bell. He appeared to be finishing extremely quickly down the home straight whilst his competitors struggled. What happened was that he ran very evenly and economically and didn't encounter the lactate accumulation that everyone else was suffering down the home straight.

Yuriy Borzakovskiy (Russia) runs very much in the same vein, although perhaps with too much restraint at times, as he has lost many races he should have won.

Women

2-16.80	Lina Batschauer-Radke (GER)	02/08/28
2-15.90	Anna Larsson (SWE)	28/08/44
2-14.80	Anna Larsson (SWE)	19/08/45
2-13.80	Anna Larsson (SWE)	30/08/45
2-13.00	Jevdokia Vasiljeva (USSR)	17/07/50
2-12.20	Valentina Pomogajeva (USSR)	26/07/51
2-12.00	Nina Pletneva (USSR)	26/08/51
2-08.50	Nina Pletneva-Otkalenko (USSR)	15/06/52
2-07.30	Nina Otkalenko (USSR)	27/08/53
2-06.60	Nina Otkalenko (USSR)	16/09/54
2-05.00	Nina Otkalenko (USSR)	24/09/55
2-04.30	Ludmila Shevtsova (USSR)	03/07/60
2-04.30	Ludmila Shevtsova (USSR)	07/09/60
2-01.20	Dixie Willis (AUS)	03/03/62
2-01.10	Anne Packer (GBR)	20/10/64
2-01.00	Judy Pollock (AUS)	28/06/67
2-00.50	Vera Nikolic (YUG)	20/07/68
1-58.50	Hildegard Falck (GER)	11/07/71
1-57.50	Svetla Zlateva (BUL)	24/08/73
1-56.00	Valentina Gerasimova (USSR)	12/06/76
1-54.90	Tatjana Kazankina (USSR)	26/07/76
1-54.85	Nadesha Olizarenko (USSR)	12/06/80
1-53.43	Nadesha Olizarenko (USSR)	27/07/80
1-53.28	Jarmila Kratochvilova (TCH)	26/07/83

The energy sources for the 800m according to A.V. Hill (1932) are stated as being around 33% aerobic and 67% anaerobic. Fox and Matthews analysed the % of energy contributions much differently: 57% aerobic, 38% lactate and 5% ATP-PC with a VO₂ max of around 135%. It is also rated as 98% of maximum effort and therefore great endurance and speed is required (Martin and Coe).

Championships

At championship level there are usually at least three races (heat, semi and final) to contend with. This should in theory, present few problems to the elite athlete, however, the slower the race, the more problems seem to occur with tripping, bumping and loss of rhythm some of the nuisances encountered. Running from the front, at a controlled pace is sometimes the best bet in terms of guaranteed success to the next round.

Tactics play a major part in 800m running especially if the pace is fast. One mistake can be very costly and pace restraint and distribution is all important. The athlete who can summon a big drive for the finish and hold form the best down the home straight will have a good chance of success.

The 800m athlete has some advantages over other middle/long distance track athletes. These include: they can run their specialist distance more often, up to two times more races than 1500m specialists and up to three times more than 5000m athletes and four times more races than those who concentrate on 10000m; they can also hold their form much longer if they are conditioned properly.

Sessions

Specific sessions for someone aiming to be running somewhere near or better than Wilson Kipketer's world record which cover speed, speed endurance and strength endurance could be as follows:

Speed

- 6 x 200m in 22.5-23.0 secs with 5 mins rec;
- 5 x 300m in 35 secs with 5 mins rec;
- 4 x 400m in 48 secs with 5 mins rec;
- 2 x 600m in 73-74 secs with 8-10 mins rec;

Speed Endurance

- 2 (3 x 200m) in 23.5 secs with 3 mins rec;
- 2 (3 x 300m) in 37 secs with 3 mins rec;
- 2 (2 x 400m) in 49.5 secs with 3 mins rec;
- 3 x 500m in 61 secs with 3 mins rec;
- (approximately 8 minutes between sets).

Strength Endurance

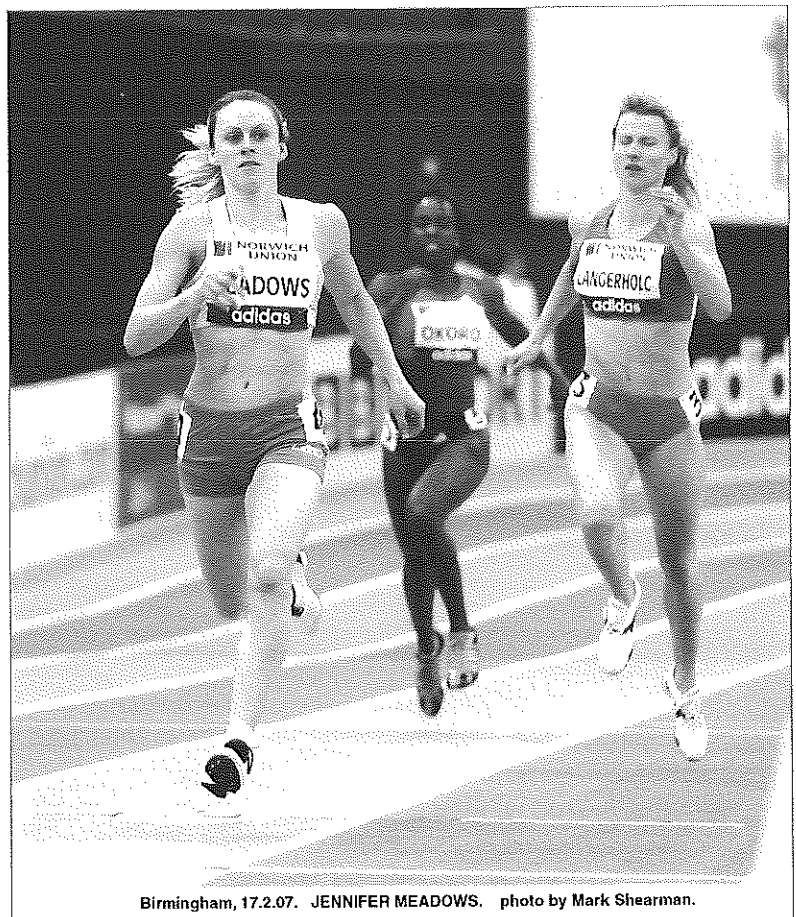
- 2 (5 x 200m) in 24.5 sec with 30 secs rec;
- 3 (3 x 300m) in 38 secs with 45 secs rec;
- 3 (2 x 400m) in 50 secs with 50 secs rec;
- 2 (2 x 500m) in 62 secs with 60 secs rec;
- (approximately 5 minutes between sets).

Lactate levels of around 15-18 mmol/l are not uncommon in an 800m race and these athletes will have great strength both in legs and upper bodies. They will have excellent VO₂ max levels and be able to tolerate high levels of acidosis which increase rapidly in the final stages of a race. Excellent basic speed is essential along with superb anaerobic endurance.

The faster sessions need longer periods of recovery than 1500m/5000m specific work. This is because much more lactic acid is accumulated and if the athlete chose to have very short recoveries when doing 100% efforts, the quality and effect of the session would diminish dramatically.

Two lap specialists of course, like any other event, don't get time for recovery in a race. Therefore, they have to do specific sessions that dictate race assimilation and this means running at race pace or slightly faster with very short recoveries. These could be:

- 3 (3 x 200m) 10-15 seconds recovery;
- 2 (3 x 300m) 15-20 seconds recovery; 3(2 x 400m) 15-20



Birmingham, 17.2.07. JENNIFER MEADOWS. photo by Mark Shearman.

seconds recovery; 2(2 x 500m) 15-20 seconds recovery. These are extremely difficult sessions with a high anaerobic and lactate accumulation content and can only be done when in peak physical and mental condition.

Lactic acid

The great physiologist, Per-Olof Åstrand, discovered that the 800m accumulates more lactic acid in the body than any other distance event. He suggested that the best way to acclimatise an athletes' body to this saturation of lactic acid was to run at 100% effort for 60 to 75 seconds. This works out at around 0.5 second faster per 100m than an athletes' 800m pb pace.

A specimen training session replicating this would be:

75 seconds at maximum effort - jog 800m recovery;

70 seconds at maximum effort - jog 800m;

65 seconds at maximum effort - jog 800m;

60 seconds at maximum effort - jog 800m.

This adapts the body to running faster than race pace and eventually tolerating lactic accumulation better than previously.

The faster the first lap or initial 200m, the quicker lactic acid build up will occur in the second lap. An athlete doesn't want to be swimming in lactic acid with 250m to go, therefore pace judgement is crucial for success.

One mistake in a two lap race is usually irreversible, as the speed at which it is run over a short distance doesn't allow for instant remedies to be made. Kicking for home too soon can be costly as well as starting too slowly. Considering there are eight runners in a championship race, all of who want to be in the first three positions after 150m-200m up until around 600m, where the real action starts, it is obvious that in most races someone will suffer through poor tactics or lack of ability.

Running behind the leader is a good tactic, only if the athlete is running on the right shoulder of that athlete. This allows him/her to respond to the runners from behind trying to overtake. Running on the kerb following the leader puts the athlete in great danger of being boxed in which means having to wait until all of the runners have passed before being able to run freely again, at which point the leaders may be out of reach.

One of the most important and difficult aspects in 800m running is keeping alert and being aware of what is happening around you when swimming in lactic acid towards the end of a race. By being in control mentally, even when physical torment is escalating, it will give the athlete a good chance of holding form and thus performing better than

their rivals when it matters, over the final 50m.

Training sessions must replicate these distressed and uncomfortable states, with the main aim being to accept the unacceptable, which means being tremendously strong in mind and body. The mind in particular must be trained to disregard chronic levels of fatigue and blocking out negative thoughts with nothing else but positive thoughts.

Differentials

The following two tables show the differential between 400m and 800m lap times of individual athletes (400m / 800m specialists) and also lap times of 800m / 1500m specialists.

Table 1

	400m	800m (per lap)	Diff
Juantorena	44.26	1-43.44 (51.72)	+7.46
Harbig	46.00	1-46.60 (53.30)	+7.30
Packer	52.20	2-01.10 (60.55)	+8.35
Kratochvilova	47.99	1-53.28 (56.64)	+8.65
Coe	46.87	1-41.73 (50.86)	+3.98
Ovett	47.50	1-44.09 (52.04)	+4.54
Cruz	47.17	1-41.77 (50.88)	+3.71

Table 2

	800m (per lap)	1500m (per lap)	Diff
Ovett	1-44.09 (52.04)	3-30.77 (56.20)	+4.16
Cram	1-42.88 (51.44)	3-29.67 (55.91)	+4.47
Elliott	1-42.97 (51.48)	3-32.69 (56.71)	+5.23
Coe	1-41.73 (50.86)	3-32.03 (56.54)	+5.78
Cruz	1-41.77 (50.88)	3-34.63 (57.23)	+6.35
Kazankina	1-54.90 (57.45)	3-52.47 (61.99)	+4.54
Holmes	1-56.21 (58.10)	3-58.07 (63.48)	+5.38

The summation is that those who are equally as good over 400m as 800m have a differential of around 7 seconds for the men and 8 seconds for the women. For those who are better at 1500m, their differentials are only approximately 4 seconds, much closer to their limits, but obviously much stronger (Table 1).

For those who are world-class at 800m and 1500m the difference in lap times is in the region of 4-5 seconds for males and also for the very best females in the world (Table 2).

The elite at 800m come in many shapes and sizes: very muscular physiques such as Peter Snell, Alberto Juantorena, Jarmila Kratochvilova and Maria Mutola to the lithe, but finely toned athletes such as Seb Coe, Wilson Kipketer, Svetlana Masterkova and Jolanda Ceplak. They all have one thing in common however, and that is very quick legs, great

strength and poise with good economical styles that produce efficient athleticism.

Just as there are many different types of physiques for the 800m specialist there are many differing training adaptations throughout the winter months. Some may not race at all from September until May of the following year, whilst others may concentrate on an indoor season and although becoming more rare these days, there are athletes who compete frequently in cross country races.

Wintering

As with most events, the winter period is a time of rebuilding, restructuring and adapting to new levels of work which hopefully will produce the fruits necessary to meet or exceed expectations in the summer season.

Although much more strength and aerobic work will be undertaken in the winter months, speed cannot be neglected for very long, if at all. Maintaining the ability to run fast is crucial for development even though the winter 'speed' sessions may be somewhat diluted from the more intense summer sessions.

Hill running can have a major role in developing leg strength and both long hills, 1 minute and longer in duration, will help with aerobic development and efficiency. Shorter, steeper hills will help with elastic strength, anaerobic development and form (high knees, arm action, leg drive, foot leverage).

Some soft sand work from time to time can be very useful in producing greater levels of leg strength and also provides excellent variety to the training plan.

There are many who argue that it is not possible to reach world-class levels at two laps without gym work which

includes one or some of these: weight training, circuit training or core stability work and this gives an idea as to what the event requirements are.

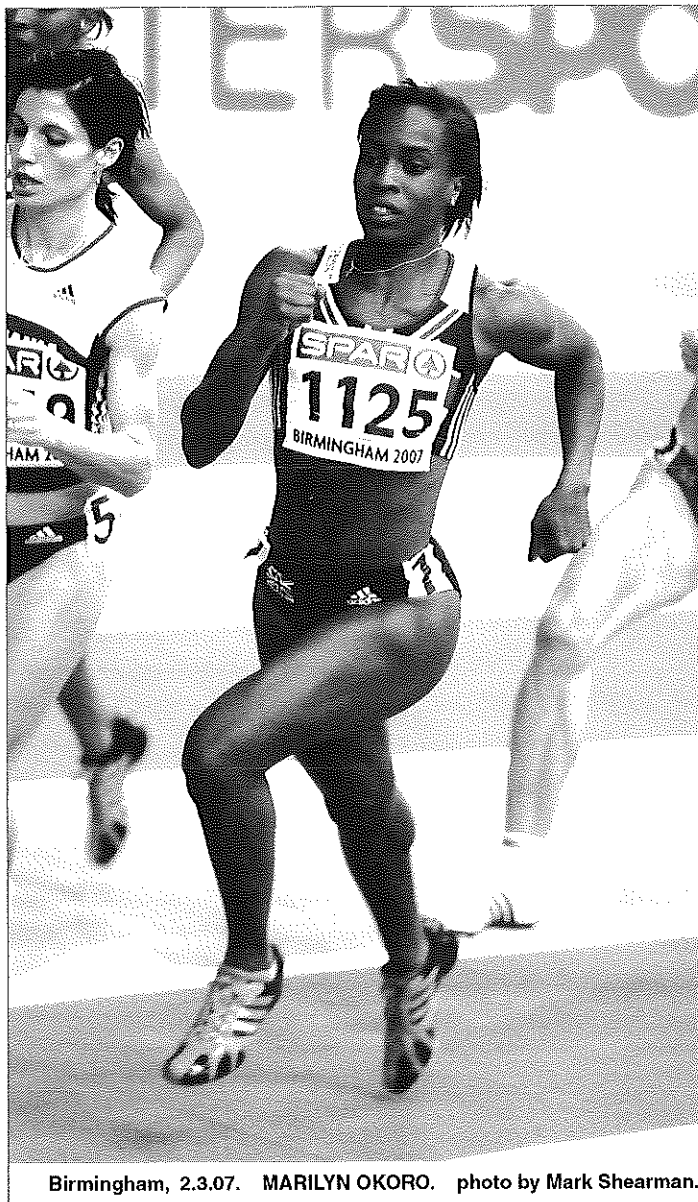
It will take superbly conditioned and gifted athletes to break the current male and female world records, world-class 1500m times along with excellent 400m capabilities are paramount for success. Without one or the other of these and the chances of achieving greatness will be diminished greatly.

When the current world records at 800m are eventually

broken, it is going to take someone with very special attributes. How much faster can the records go is anyone's guess? Perhaps those special attributes needed to run much faster are not possessed by anyone at the moment and nature will have to develop a human being with far greater physiological gifts than any athlete has at the moment.

It is interesting to look at the predictions of H. Morton (March 1984) who predicted that the men's 800m world record would be 1-40.9 in 2000 (fairly accurate), 1-40.1 in 2010, with an ultimate ceiling of 1-33.0 sometime in the 22nd century!

These times will look incongruous to most, but in 1903 Harry Andrews was quoted as saying: "W.G. George's world mile record of 4-12.75 would in all probability never be beaten!"



Birmingham, 2.3.07. MARILYN OKORO. photo by Mark Shearman.

So as we deliberate that no-one is capable of 1 minute 40 seconds or faster at the moment for the men, in 5 -10 years we may have a different perspective once that barrier has been broken. Nothing stands still forever and what seems impossible now will surely be attainable in the future through better training, nutrition, physique and lifestyle.

Is this the formula for the future

by Frank Horwill

Not long ago I received a letter from an East Anglian runner in which he stated that after considerable study he had come to the conclusion that we, the British distance runner, were doomed to be perpetual also-rans unless we made dramatic changes in the way we groomed athletes for world-class performance. His contention was that the chances of a club coach or an individual coach training athletes from various clubs to world class were now highly unlikely even with a sophisticated back-up system of support. The future, he asserted was now full-time athletes in a residential training camp, possibly for several years. I have to say that my initial reaction to the latter was one of irritation and in my reply I suggested he got on with his training and committed himself to becoming an Olympian instead of trying to solve our distance-running problems.

History tells us that from 1932 to around 1990, most middle and long-distance records and Olympic medals gained by males fell into certain preparatory categories:-

1. The athlete worked for a living or was studying and was coached by a club or college coach. An example of those in this group include: Jack Lovelock, Sydney Wooderson, Roger Bannister, Derek Ibbotson, Seb Coe, Steve Ovett, Steve Cream and Dave Moorcroft. All broke world records but not all gained Olympic success. A few trained full-time after completing their studies.
2. State assisted athletes, not necessarily under one roof but given generous support to pursue their running careers. Vladimir Kuts and Bolotnikov from the Soviet Union were the first of a large batch to

enjoy this luxury, as were most East Germans in their wake.

3. Loners who were self-coached and also were employed such as Zatopek and Ron Clarke, the latter being coached as a junior but not as a senior.

The advent of financial reward for running success set in motion some new strategies:

1. The creation of agents some of whom wanted all their charges under one roof, eating, sleeping and training together.
2. The establishment of state-run training camps on a full-time basis free of charge to the athletes but with rigid entry requirements. The state would later claim a percentage of the athlete's winnings. The Moroccan regime has proved highly successful.

Suddenly, we had a whole new ball game, and the game required and will require some cultural changes. For instance, one question to be asked and answered will be: "Do you wish to become a professional runner?" In some countries the choice will be simple, for instance, in Kenya the average monthly wage is considerably less than the average weekly salary in the U.K. The same applies in many other African countries.

Here, in this country, the young do not think on such lines. We think in terms of school, university degree, a job, and success in running is either a parallel activity or last priority. It is, in fact a sport not a profession in the first instance. We are not yet at home with a young male athlete declaring, "I want to earn my living as a runner."

Whereas such a declaration to become a professional footballer will not raise eyebrows. The late Harry Wilson, Ovett's coach, discussed with me the possible establishment of "...a squad dedicated to breaking world records training together under one roof..."

It is somewhat surprising that some of the giant sports goods providers have not ventured into this field instead of piece meal sponsoring of above average athletes which in this country has not led to world-class performances in return.

Would the formation of a group on the lines that Harry Wilson envisaged be a viable proposition? The obvious initial benefits would be free accommodation, food and sportswear. The medical and physiological monitoring of each athlete would be regular and convenient. Training would always be in the company of equals. Educational ambitions could be met via recognised correspondence courses.

The venue would obviously need to meet many practical requirements. The minimum and maximum age of entry to the group would have to be determined, as would performance standards.

But, is this a pie-in-the-sky vision for British athletes and yet acceptable to our African opposition? Well, not among some athletes it seems. At a Surrey County Schools cross-country course a few years ago I asked how many athletes would like to train full-time under one roof with all essentials provided. Two-thirds of the sixty athletes present said they would avail themselves of the opportunity if it arose.

The cost of such an undertaking would be considerable but not prohibitive.

African training camps are not held in five-star hotels. Bunk-beds are the rule at most and the Moroccans have a system whereby the better your performance the more luxurious your accommodation becomes.

We have to ask whether it is realistic that a club coach in this country will

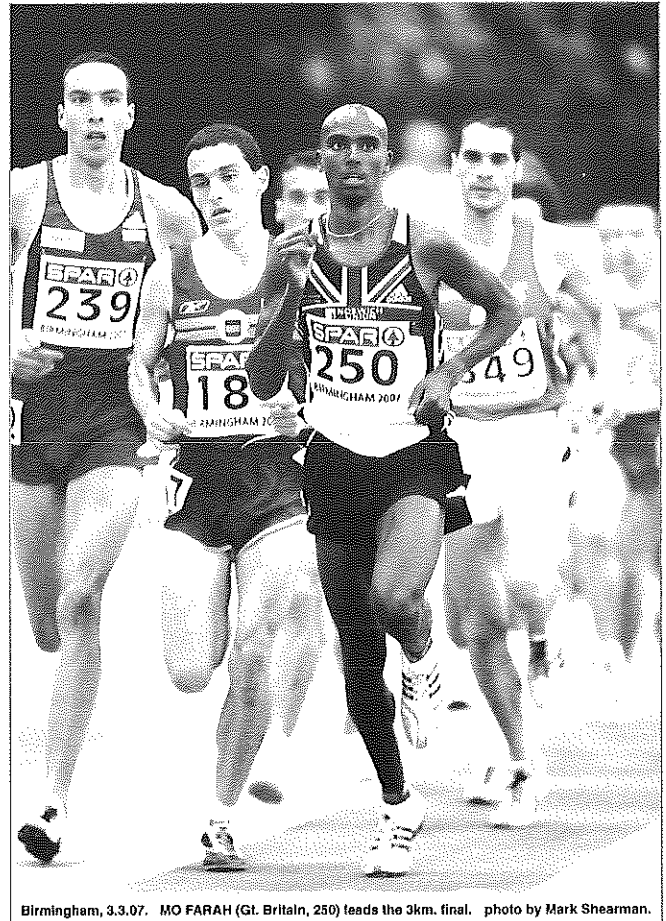
produce another Dave Bedford or Brendan Foster even with a complicated and confusing official support system? We also need to question whether universities with an athletics tradition can serve two masters, academic achievement and world-class performance. Even in non-educational African training camps they

are hard put to it to maintain supremacy.

Is our whole concept of getting on terms with world-class distance running to be likened to Oscar Wilde's observation about a group he disliked, "They see wonderful things through keyholes."



Mombasa, 24.3.07. ANDREW LIVINGSTONE. photo by Mark Shearman.



Birmingham, 3.3.07. MO FARAH (Gt. Britain, 250) leads the 3km. final. photo by Mark Shearman.

The metric mile examined

by David Lowes

David Lowes makes an in-depth analysis of the 1500m event, how it has progressed, the mental and physiological qualities competitors need and the training and coaching techniques that lead to success

The 1500 metres is sometimes called the 'blue riband' event in a major championship. It is so named because it is an event that can be intriguing for spectators over a comparatively short distance and one that usually produces exciting finishes and drama.

Due to its relative brevity, it holds the attention of the crowd and more often than not the competitors deliver raw excitement due to the fluctuating tactics.

The world records for males and females have moved on significantly over the years with superlative performances which now require world-class capabilities at 800m and 3000m and also possibly at 5000m as well.

Gone are the days where the world's best 1500m athletes were only good at their chosen speciality, they need to be amongst the world's best at the shorter and longer distances as well. 800m specialists may embarrass 1500m specialists occasionally by outkicking them. However the same can be said for 1500m specialists who can sometimes outrun their counterparts and also have the ability to embarrass the 5000m specialists by outkicking them.

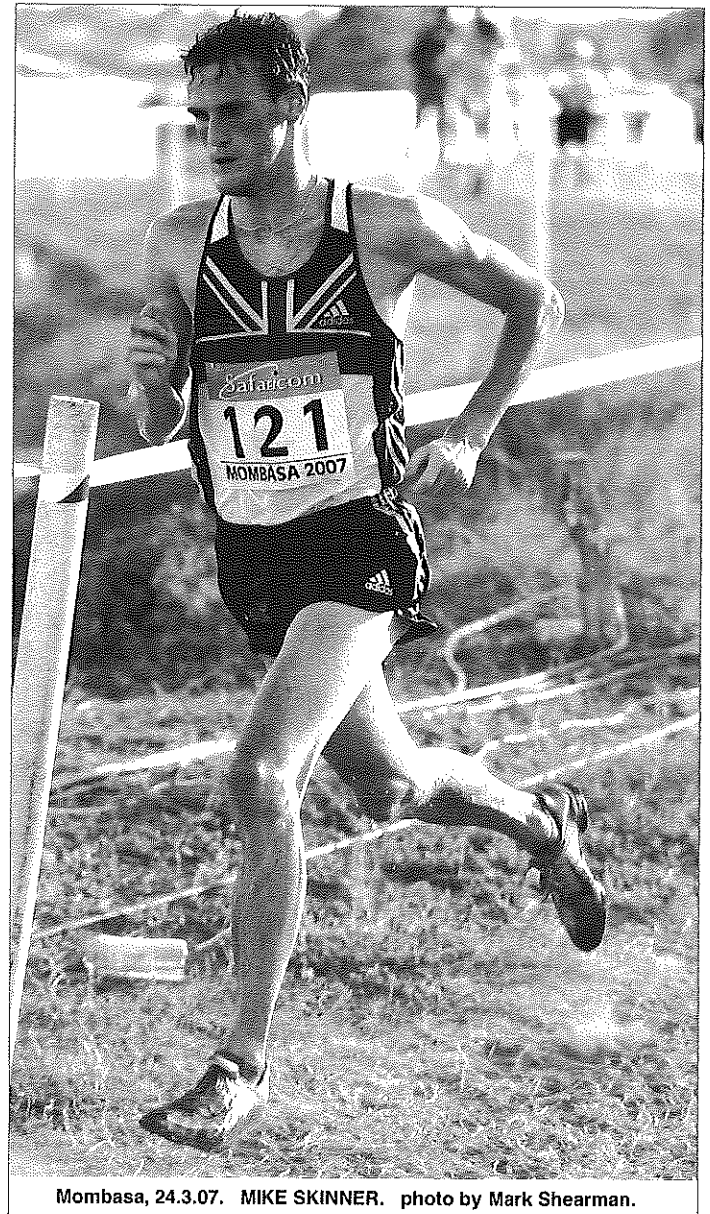
The men's world record of 3-26.00 by Hicham El Guerrouj (Morocco) which was set in 1998 in Rome is a full 9.6 seconds faster than the great Herb Elliott (Australia) ran in the Rome Olympic final in 1960.

The women's world record of 3-50.46 by Qu Yunxia (China) which was set in 1993 in Peking is an unbelievable 27 seconds faster than Great Britain's Anne Smith ran in 1967.

If we look at the Olympic Games results for males in 1896, Edwin Flack from Australia won the gold in Athens in 4-33.2, a time most elite 17-18 year old girls can better nowadays!

They were running 4-06.2 four years later in Paris 1900 (Charles Bennett – GB) to win the gold and by 1936 in Berlin the great Jack Lovelock from New Zealand ran 3-47.8 to take the honours.

The legendary and undefeated Herb Elliott ran a world record



Mombasa, 24.3.07. MIKE SKINNER. photo by Mark Shearman.

3-35.6 in the 1960 Rome final to win by three seconds. All of these athletes remember did their feats on cinder tracks and it is obviously debatable how much faster some of these athletes would have ran today.

Kip Keino (Kenya) ran 3-34.91 in the rarified air of Mexico City in 1968, the first games on a synthetic surface and it wasn't until the Los Angeles games of 1984 where our own Seb Coe ran faster recording 3-32.53 to take the gold from Steve Cram.

In Sydney 2000, arguably one of the biggest upsets of the games produced an Olympic record of 3-32.07 for Noah Ngeny (Kenya) who powered past an out-of-sorts El Guerrouj to take the title.

Looking at the history of female Olympic performances again

shows what amazing progress has been made albeit over a much shorter period of time.

Women weren't considered strong enough to run any further than 800m in the Olympics prior to 1972. In the inaugural 1972 women's final in Munich, Lyudmila Bragina (USSR) took the title in 4.01.4. By 1980 in Moscow Tatyana Kazankina (USSR) ran 3-56.6 for Olympic gold. By 1988 in Seoul, Paula Ivan (Romania) ran 3-53.96 which is still the Olympic record today.

Men's progression

A look at the progression of the world record's at 1500m shows how much they have improved through better training and better surfaces.

Men

3-26.00	Hicham El Guerrouj (MAR)	14/07/98
3-27.37	Noureddine Morcelli (ALG)	12/07/95
3-28.86	Noureddine Morcelli (ALG)	06/09/92
3-29.46	Said Aouita (MAR)	23/08/85
3-29.67	Steve Cram (GBR)	16/07/85
3-30.77	Steve Ovett (GBR)	04/09/83
3-31.24	Sydney Maree (USA)	28/08/83
3-31.86	Steve Ovett (GBR)	27/08/80
3-32.03	Sebastian Coe (GBR)	15/08/79
3-32.16	Filbert Bayi (TAN)	02/02/74
3-33.1	Jim Ryun (USA)	08/07/67
3-35.6	Herb Elliott (AUS)	06/09/60
3-36.0	Herb Elliott (AUS)	28/08/58
3-38.1	Stanislav Jungwirth (CZE)	12/07/57
3-40.2	Olavi Salsona (FIN)	11/07/57
3-40.6	Istvan Rozsavolgyi (HUN)	03/08/56
3-40.8	Gunnar Neilsen (DEN)	06/09/55
3-41.8	John Landy (AUS)	21/06/54
3-42.8	Wes Santee (USA)	04/06/54
3-43.0	Wener Lueg (FRG)	29/06/52
3-45.0	Arne Andersson (SWE)	17/08/43
3-45.8	Gunder Hagg (SWE)	17/07/42
3-47.6	Gunder Hagg (SWE)	10/08/41
3-47.8	Jack Lovelock (NZL)	06/08/36
3-49.0	Luigi Beccali (ITA)	17/10/33
3-39.2	Jules Ladoumegue (FRA)	05/10/30
3-51.0	Otto Pelzer (GER)	11/09/26
3-52.6	Paavo Nurmi (FIN)	19/06/24

The above list shows that the world record has improved 26.6 seconds over 74 years – a huge distance over 33/4 laps. Closer scrutiny indicates that the improvements may be cyclical, where the record has stood stagnant for many years and then improved frequently over 1-2 years.

Herb Elliott held the WR for nine years from 1958 until

1967 before my hero at the time (first year in athletics), Jim Ryun shattered his time by 2.5 seconds with 3-33.1. This mark stood for another 6 1/2 years before an epic Commonwealth Games final in New Zealand where Filbert Bayi front ran an amazing 3-32.16. This record stood for five years before Great Britain's golden era began with the record changing frequently over the next five years between Coe, Ovett and Cram, interspersed by Sydney Maree and the brilliant Said Aouita.

Aouita's mark was to stand for a further seven years before Noureddine Morcelli reigned supreme for another six years. Hicham El Guerrouj, who is the present world record holder, did it in 1998 – five years ago – so if things go in cycles, the record is due to go in the next two years! It will take someone with unbelievable capabilities to go sub 3-26.00, but people thought 4 minutes for the mile was impossible until Roger Bannister came along, and then many started to believe even faster was possible.

Women

3-50.46	Qu Yunxia (CHN)	11/09/93
3-52.47	Tatyana Kazankina (URS)	13/08/80
3-55.0	Tatyana Kazankina (URS)	06/07/80
3-56.0	Tatyana Kazankina (URS)	28/06/76
4-01.38	Lyudmila Bragina (URS)	09/09/72
4-05.07	Lyudmila Bragina (URS)	07/09/72
4-06.47	Lyudmila Bragina (URS)	04/09/72
4-06.9	Lyudmila Bragina (URS)	18/07/72
4-09.62	Karin Burneleit (GDR)	15/08/71
4-10.77	Jaroslava Jehiliskova (CZE)	20/09/69
4-12.4	Paolo Pigni (ITA)	02/07/69
4-15.6	Maria Gommers (NED)	24/10/67
4-17.3	Anne Smith (GBR)	03/06/67
4-19.0	Marise Chamberlain (NZL)	08/12/62
4-29.7	Diane Leather (GBR)	19/07/57
4-30.0	Diane Leather (GBR)	16/05/57
4-35.4	Phyllis Perkins (GBR)	17/05/56
4-37.0	Nina Pletnyova (URS)	30/08/52
4-37.8	Olga Ovsyannikova (URS)	15/09/46
4-38.0	Yevdokiya Vasilyeva (URS)	17/08/44
4-41.8	Anna Zaytseva (URS)	10/06/40
4-45.2	Yevdokiya Vasilyeva (URS)	13/09/37
4-47.2	Yevdokiya Vasilyeva (URS)	30/07/36
5-02.0	Lydia Freiberg (URS)	13/07/36
5-07.0	Anna Muskina (URS)	16/09/34
5-18.2	Anna Muskina (URS)	19/08/27

Women's progression

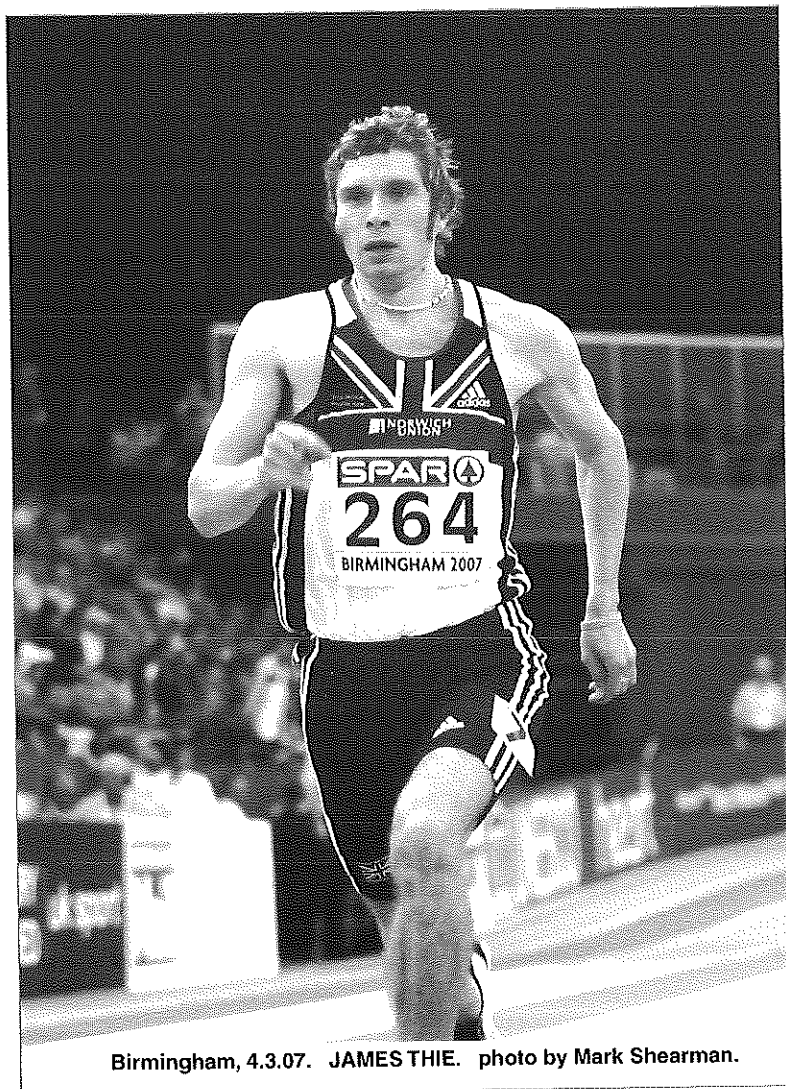
The women's progression is similar to the men's – 28 seconds over 66 years. The improvements have been more marked due to the event not being taken seriously until

included in championship events (Munich 1972).

Unfortunately, since the early 70s many people have intimated that the women's records have been aided by unfair means. Nothing has ever been proved, so we must presume that these astoundingly gifted athletes have been better trained and also work much harder than others.

Indeed, there are some thoughts that the present record of Yunxia is 'unreal'. But scrutiny of this shows that this is a time all of the top women should be running in relation to the progress of the event. No-one has queried the validity of El Guerrouj's record and only Bernard Lagat (Kenya) and the Moroccan himself have run close to the record.

Comparing the improvements of the men to the women over the last sixty years or so, shows practically the same percentage of improvement in both sexes. However, whereas in 1943 Arne Andersson ran 3-45.0, a reasonable 'junior' time nowadays, the women's event was very much in its embryonic formation with a time of 4-38.0 by Yevdokiya Vasilyeva which is a time most elite 16 year old girls can better today.



Birmingham, 4.3.07. JAMES THIE. photo by Mark Shearman.

To emphasise the evolution of women's running Paula Radcliffe's average pace for her world record marathon is faster than the world 1500m in 1936 by Muskina. That's 28 x 1500m with no recovery!

Going back only 30 years shows that the men's record of 3-32.16 by Filbert Bayi still equates to a world-class performance today and he would be number one in the world in most countries. For the women, the story is much the same, Lyudmila Bragina's 4-01.38 still equates to a world ranking performance.

Since 1967 the record has improved on average every 1-2 years until Bragina made the record her own property for four years. Tatyana Kazankina did even better, breaking the record many times and holding it for an unprecedented 17 years. The so far untouchable world record at present by Qu Yunxia of 3-50.46 has stood for ten years and therefore the record over the past 31 years has only been held by three athletes!

World records analysis

If we analyse El Guerrouj's world record of 3-26.0 it equates to 54.9 seconds per 400 metres and involves going through 800m in 1-49.8. A further insight reveals even more astounding statistics: 15 x 100m in 13.7 seconds, 7 x 200m in 27.4 seconds + 100m in 13.7 seconds, 5 x 300m in 41.2 seconds, 2 x 600m in 82.4 + 300m in 41.2 seconds, 1 x 1200m in 2-44.8 + 300m in 41.2 seconds ... all these with no recoveries!

A similar investigation into Yunxia's world record of 3-50.46 reveals 61.4 seconds per 400 metres which means an 800m at even pace in 2-02.8. Her statistics reveal: 15 x 100m in 15.3 seconds, 7 x 200m in 30.7 seconds + 100m in 15.3 seconds, 5 x 300m in 46 seconds, 2 x 600m in 92.1 seconds + 300m in 46 seconds, 1 x 1200m in 3-04.3 + 300m in 46 seconds ... brilliant sessions with recoveries, but in her case there wasn't any!

What these illustrations show is what unbelievable records these are and what superhuman fitness levels, ability and genetic make-ups they possess.

Demands

There are many athletes when prompted who say that they can't run 800m. What they really mean is that they are either afraid of the event or are not prepared to put in the necessary work to develop the speed

required. Without a top class 800m time, a reasonable 400m time and the ability to run 3000m well, the likelihood is that the athlete's 1500m capability will be diminished greatly.

An athlete with an excellent 800m time will be able to cope much better with the demands of the 1500m by being much more relaxed in mid-race and having the necessary dynamic power (elastic strength) to produce fast finishes. Also, the athlete with excellent 3000m capabilities will have no fear of tying-up in fast run races at their specialist distance. By having good 400m speed helps the athlete produce that extra effort in the last 50m when tired through better speed and lactate tolerance.

Not all 1500m races are ran with the help of pace-makers as we see on the grand prix circuit, which usually result in fast times. Many races, especially major championships, can be ran much more conservatively and in some cases be much more slower in the first few laps than a 5000m or 10000m race. Many top class athletes are so used to running at world record pace that they feel lost when it becomes 'cat and mouse'. These type of races usually produce finishes that are faster than an 800m and thus many different paces need to be encountered in training sessions.

Tactics

The major difference between track running and cross country running, apart from the surface is tactics and the fact that there is usually three races (heat, semi-final and final) to encounter in a major championship. In 1500m races, those with poor finishes will have to work much harder in their respective heats if the seeding is tough with quality opposition and/or hard qualification standards (first two plus six fastest losers). Therefore the hardest race and most tiring may well be the final due to the possibility of running two brisk races in two days to qualify.

Some of the tactics to consider are having first-hand knowledge of your opponents and how you will run the race yourself:

- Who has a fast finish?
- Who usually makes a move from a long way out?
- Who likes to front-run at a fast-pace?
- Who is on top form?
- What are your own strengths/weaknesses?
- Will the weather have an effect on tactics?
- Do I need to run fast or place to qualify?
- Will I let unexpected occurrences affect me?

Requirements

Track running throws up many hiccups that the best find difficult to overcome. For a start everyone, usually 12 athletes are vying for the inside lane and this can cause tripping and much bumping albeit accidental. It is essential to get in as good a position as possible with as much 'free space' as is permissible to allow for covering any breaks by the front-runners. The slower the pace the higher the likelihood of getting bumped or tripped. Top class runners should run their heats at a reasonable pace if the race starts off very slowly to eradicate these malaises.

A look at the energy system requirements for 1500m suggests it is 50% aerobic and 50% anaerobic (AV Hill, 1932). However, Fox and Matthews (1976) gave a more detailed and different analysis and stated that the energy pathways were 76% aerobic, 22% lactate and 2% ATP-PC with a VO₂ max of around 112%. Therefore in the specific training cycle there is a definite shift towards anaerobic work which will produce the training effect that is needed to run quickly for 33/4 laps.

What is important is having an excellent lactate threshold (onset of blood lactate accumulation) and two athletes with similar VO₂ max levels will be separated in a race by the one with the higher lactate threshold.

Lactate levels of 12 mmol/l are common in a 1500m race compared to 18 mmol/l in an 800m, so these necessities must be considered in the training plan.

It is no good having a VO₂ max in excess of 75ml/kg/min if lactate tolerance levels are poor.

The ability to tolerate acidosis better than your opponents is crucial to pave the way to success and a large proportion of sessions need to be incorporated into the training plan.

Looking more closely at the differentiation between 1500m and 800m lap times of individual athletes (1500m specialists) suggests some fairly constant criteria which should be useful in calculating at what velocity you should and need to be running the shorter distance to ensure success.

	800m	(per lap)	1500m	(per lap)	Diff
Steve Cram	1-42.88	(51.44)	3.29.67	(55.91)	+4.47
Steve Ovett	1-44.09	(52.04)	3.30.77	(56.20)	+4.16
Seb Coe	1.41.73	(50.86)	3.29.77	(55.93)	+5.07
Jim Ryun	1.44.40	(52.20)	3.33.10	(56.82)	+4.62
Kelly Holmes	1-56.21	(58.10)	3-58.07	(63.48)	+5.38
Chris Boxer	1-59.05	(59.52)	4-00.57	(64.15)	+4.63
Kirsty Wade	1-57.42	(58.71)	4-00.70	(64.18)	+5.47

This list shows that the average difference is around 4.5 seconds per 400m between 1500m and 800m paces. Two of the athletes in the above with differentials of more than 5

seconds have significantly better 400m individual times than their counterparts.

This indicates that those with high capabilities at the shorter distances can run almost as well at 800m and 1500m due to superior economy from their speed reserve (Coe: 400m 46.87, 800m, 1000m and 1500m world record holder). Some of the others such as Overt and Cram had better capabilities at 5000m than the others and succeeded because of their enhanced endurance reserves.

This equation works just as well with good club runners and youngsters e.g. 4-00.00 (64 secs per 400m) means that with adequate endurance and speed the athlete should aim for an 800m time of around 1-59.0. Likewise, the same differential should apply to 400m as well, therefore a time of around 54 seconds should be the target. Obviously some athletes are more speed oriented and some have greater endurance capabilities. Having both is what is needed to get to the highest level at both events a la Seb Coe.

The world's greatest 1500m runner, Hicham El Guerrouj amazingly never runs 800m in competition, however it has not hindered his advancement at his specialist event. He obviously makes up for the lack of fine tuning in competition by doing his fast lactate work in training. Based on the formula for estimating his 800m capability from his 1500m time (54.93) it equates to at least 1-41.0 which would be near or better than the present 800m world record by Wilson Kipketer!

Four-lap fear

What I sometimes find difficult to comprehend, especially in youngsters, is that they are afraid to run a 1500m, preferring to run 3000m in almost every race for their clubs. They have no fear in running for 20 minutes or longer in cross country races, yet they opt out of running for 4 minutes or less! This is not uncommon as I have had several in my own group whose club value points in league matches more importantly than

individual development. Many athletes have not even run an 800m before, yes – it is hard with a high proportion of anaerobic capacity and much lactate build-up. Without its inclusion in the racing plan, it is unlikely that success will come in the athletes specialist 1500m racing distance.

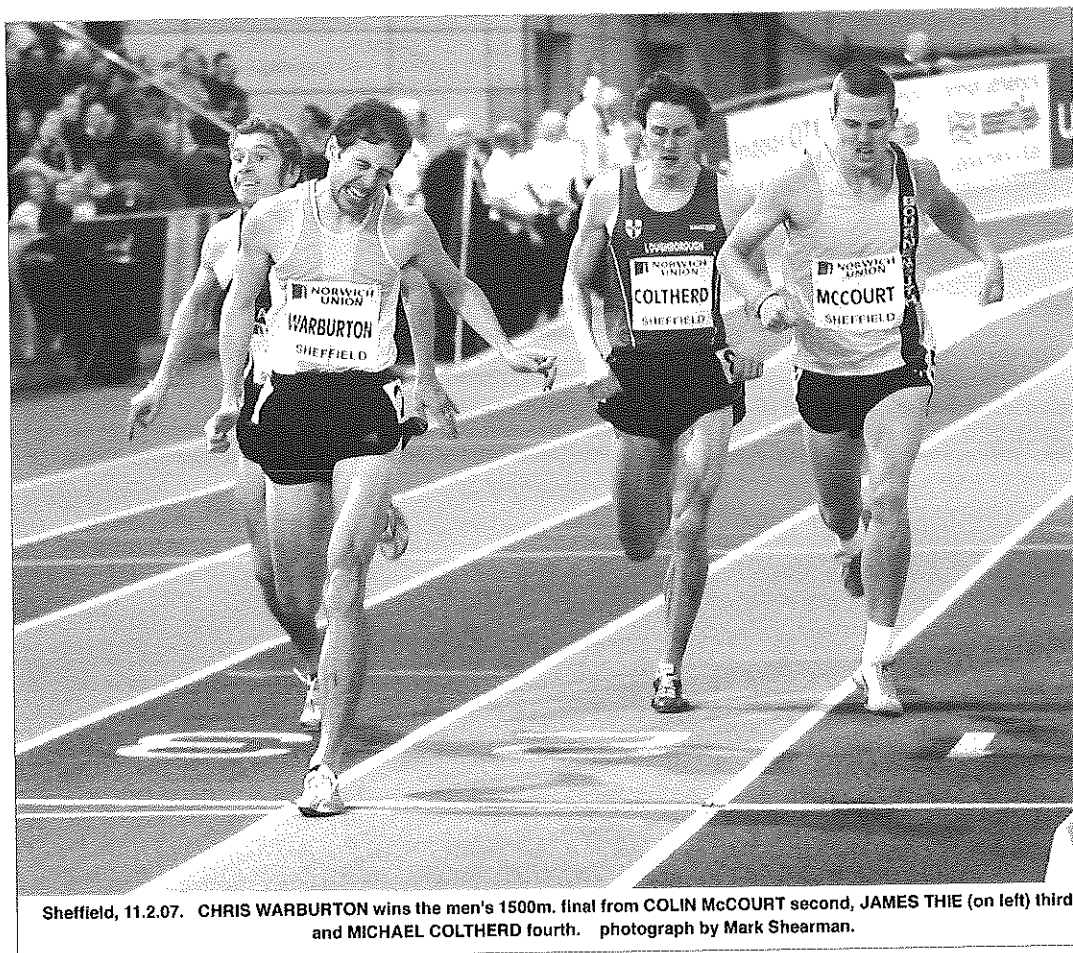
The idea for the 1500m athlete in terms of 400m lap pace, is to get as much differential as possible between higher and lower distances. For a 4 minute athlete (64 seconds), he/she needs to be able to run 800m with a comfortable 400m split of 59 seconds and have a 400m pb of around 54-55 seconds. The more range, the better the scope for economical fast running in one's specialist distance.

Coaching methods

A brief insight into some of the training methods by coaches of world-leading athletes gives us an idea of how development of the 1500m has moved on:

Paavo Nurmi, winner of nine Olympic gold medals and many world records in the 1920s and 30s was coached in Finland by Lauri Pikkala who advocated work with short periods of running and rest which was probably the first form of interval training.

German athlete Rudolf Harbig was coached by Woldemar Gerschler and physiologist Herbert Reindell who were the first to bring science into interval training. In the late 1930s



Sheffield, 11.2.07. CHRIS WARBURTON wins the men's 1500m. final from COLIN McCOURT second, JAMES THIE (on left) third and MICHAEL COLTHERD fourth. photograph by Mark Shearman.

they utilised short repetitions of 100m and 200m at around 3-6 seconds slower than they could run for those distances. The difference in these sessions was that they waited for their pulse to drop from around 180bpm to 120bpm (around 90 seconds) before re-commencing another repetition.

Around about the same era, Swedish coach Gosta Holmer whose athletes were world-leaders, Gunder Hagg and Arne Andersson, introduced a different type of work called Fartlek (speed play). Inspired by the beautiful surroundings in the forests of Sweden he developed fast running interspersed by slower running on a route that included uphill, downhill and flat sections.

In the early 1950s Hungarian coach Mihlov Igloi whose athletes included Sandor Iharos included twice a day training and was entirely based on interval training. The main difference in his regime was running at faster speeds to develop lactic acid tolerance.

Franz Stampfl, another great coach from the 1950s, was a disciple of interval training and included it in his athletes sessions 3-4 times per week. The distances used would vary from 400m up to 2400m, with the reps being fairly slow in the autumn months and building up speed towards the track season. Roger Bannister was his most famous athlete along with Chris Chataway and Chris Brasher. Bannister would only run a maximum of around 28 miles per week, partly due to his medical studies, but he still ran sub-4 for a mile (something to think about)!

Herb Elliott the great Australian athlete was coached in the late 1950s and early 60s by Percy Cerutti. His training was much more intense than any other 1500m athlete had undertaken up to that time. It included much sand dune running, 10 miles every day, up to 35 miles once a week and also some weight training, plus his track sessions.

New Zealand coach, Arthur Lydiard who coached amongst others Peter Snell in the early 1960s was another who introduced a new plan never tried before. He had his athletes start with a period of long slow distance running (marathon training), this was followed by six weeks of hill running and then six weeks of track training, before an easing down period before the major competition of the season. This involved up to 100 miles per week in the aerobic endurance phase, and that for an 800m and 1500m Olympic champion.

Peter Coe, coach to his son Seb, developed his strength in the winter months in the gym with weight sessions up to three times per week. Hill running was an important factor in his progress and concentration was on form (style) as well as

lactate tolerance development. He ran some sessions at 5k pace (13-20) and could run 7 x 800m under 2-08 with around 45 seconds recovery. His longest run was around 10 miles at sub 6 minutes per mile and his shorter runs much faster.

These are just some examples as to how the development of training has evolved and how some coaches felt that something different to the norm had to be tried to get their athlete(s) to improve to world-class.

Guerrouj's training

A brief look at Hicham El Guerrouj's training and development shows how a promising young athlete has attained the highest level possible through a system ran by the Moroccans (Velediaz).

Their approach is more scientific than the Kenyans and Ethiopians who rely to a large extent on their habitats which are invariably at altitude.

In Morocco they have a talent spotting process for 12-16 year olds and the chosen aspirants are given tests such as a short run, a middle distance race and a standing long jump which determine their reaction speed, endurance and explosive strength. They also get treadmill and blood tests. The athletes who they think are better than average are then sent to a Preparation Unit where paid coaches oversee their early development.

After this the better ones are sent to a Perfecting Unit which caters for about 60 athletes between the ages of 16-19. After much scientific testing the elite athletes with the most potential are sent to the National Institute of Athletics at Ifrane. It is here that their training is planned along with running style and diet. They train and live at the centre, with food, housing and a salary being provided by the government and the king of Morocco.

El Guerrouj was born at sea level and was at the National Institute of Athletics in Rabat, 1990-91. He was in the Moroccan Junior team at the World Cross Country the following year where he finished 14th and later that year finished 3rd in the World Junior track championships at 5000m (13-46). His training consists of a high level of quality and does not include large quantities of volume. On his continuous runs he runs at around 3-00/km and sometimes 2-50/km (around 4-35 to 4-50/mile) over distances ranging from 30-60 minutes.

Like Coe, he works with weights and gym apparatus to enhance the main muscle groups as well as the minor ones. Hillwork develops his power with a session such as 10 x

300m along with plyometric training. Work on drills and stretching are always done.

Much of his quality track sessions are done with the help from other athletes who act as 'rabbits' and who put in surges which he has to respond to. He trains at altitude for a minimum of three weeks and goes there (Ifrane, 1650m) several times a year.

Without going into his specific sessions, one thing is certain, he trains very hard. With a time of 3-26.0 for 1500m and a predicted capability of an ultra fast 800m, he also has the talent to run very fast over 5000m, which is his target.

One thing to look for in his running is how economical he is. If you were to tape one of his races and blank out his torso it would be difficult to notice any difference in his leg cadence. When he speeds up over the last 400m he does it with minimal effort and no noticeable change of style. How many times does he finish a race in sub 3-30 and look totally untroubled?

Seasonal training

Athletes who consider themselves 1500m specialists therefore need to be efficient with sustainable speed and be able to respond to many pace changes and also have a very strong finish to get amongst the medals.

Tactics play a major role in the 1500m, but not as much as in the 800m where a poor start or getting baulked usually costs the athlete the race. There is more time to readjust if there is a mishap, but generally the athlete needs to be where he/she wants to cover any break, whether a long run for home or a final sprint. Running wide doesn't cost as much energy as most people think and the extra distance covered by running on someone's right shoulder is negligible.

Many middle distance athletes put in a lot of work over the winter months and tot up reasonable mileages to enhance their endurance capabilities. However, many lose this endurance effect quickly in the summer months by over emphasising the speed elements. They forgo medium to long runs, hillwork and weight training – the things that must be maintained through most of the summer to keep their endurance levels high.

Early season

Early season pb's sometimes cloud the issue and they think that if they do more speedwork to the detriment of aerobic running then they will get even faster.

The scenario is the same every year for most youngsters ... the clocks go forward, the nights are lighter and the weather

is better ... out come the spikes, off go the tracksters and they start running very fast. By mid-June their seasons tend to decline because they have neglected their endurance base and they can't keep training at the levels at which they started. When progress drops-off, so does their confidence and ultimately their season is finished before it is half-way through.

Overdoing track sessions that regularly accumulate lactate can result in deterioration of performance by not giving the body enough time to recover and also increase the chances of injury. There are also some athletes who include very little speed in their winter training and thus take nearly all of the summer to speed up. Speed must be maintained all year round, albeit at a reduced level – the track season is so short, if you blink, it's gone!

The 1500m runner will probably be in better 3k/5k form in late April and early May due to the huge endurance background gained from the winter work. However, as the season progresses towards the major goal it is quite feasible that he/she will be running just as well over 800m depending on their physiological make-up (800m/1500m type or a 1500m/3000m type).

The type of work carried out in mid-March will be different to that done in mid-June. For example, in March, there may be an OBLA run, a 10k pace session along with a 5k and 3k session (not necessarily on a track), some 1500m pace reps and hillwork in the training microcycle.

In June however, the quality work may be over 3k, 1500m, 800m, 400m paces with OBLA runs and hillwork dropped to allow for speed development.

Mental toughness

To be a top-class competitor at middle distances you need one thing above all else – mental toughness. When the pain from fatigue is great and you feel that your lungs cannot take in any more oxygen and you are swimming in lactic acid, you need a resolve that largely ignores those factors.

The only way to overcome this is by reproducing it regularly in training. Mental and physical toughness go hand in hand. So next time you see El Guerrouj winning with ease and with no visible signs of discomfort, he has done so because he has endured that type of pain and more in his sessions.

Doing typical basic 1500m sessions for a target of 3-42 could be: 10 x 400m in 58.5 seconds with 45 seconds recovery or 8 x 400m in 57 seconds with 90 seconds recovery; 12 x 300m in 43 seconds with 45 seconds recovery or 10 x 300m in 41 seconds with 75

seconds recovery; 16 x 200m in 28.5 seconds with 20 seconds recovery or 12 x 200m in 27 seconds with 45 seconds recovery.

However, there will come a time where the athlete may want to simulate racing conditions to test more accurately their fitness levels. This can be done via a time-trial over 1200m with the help of some pacemakers who can join in at different points i.e. first 400m, second 400m, third 400m. The time to aim at for an even paced 3-42 is around 2-57, but for the purpose of the time-trial it would be better to go for around 2-55 or faster.

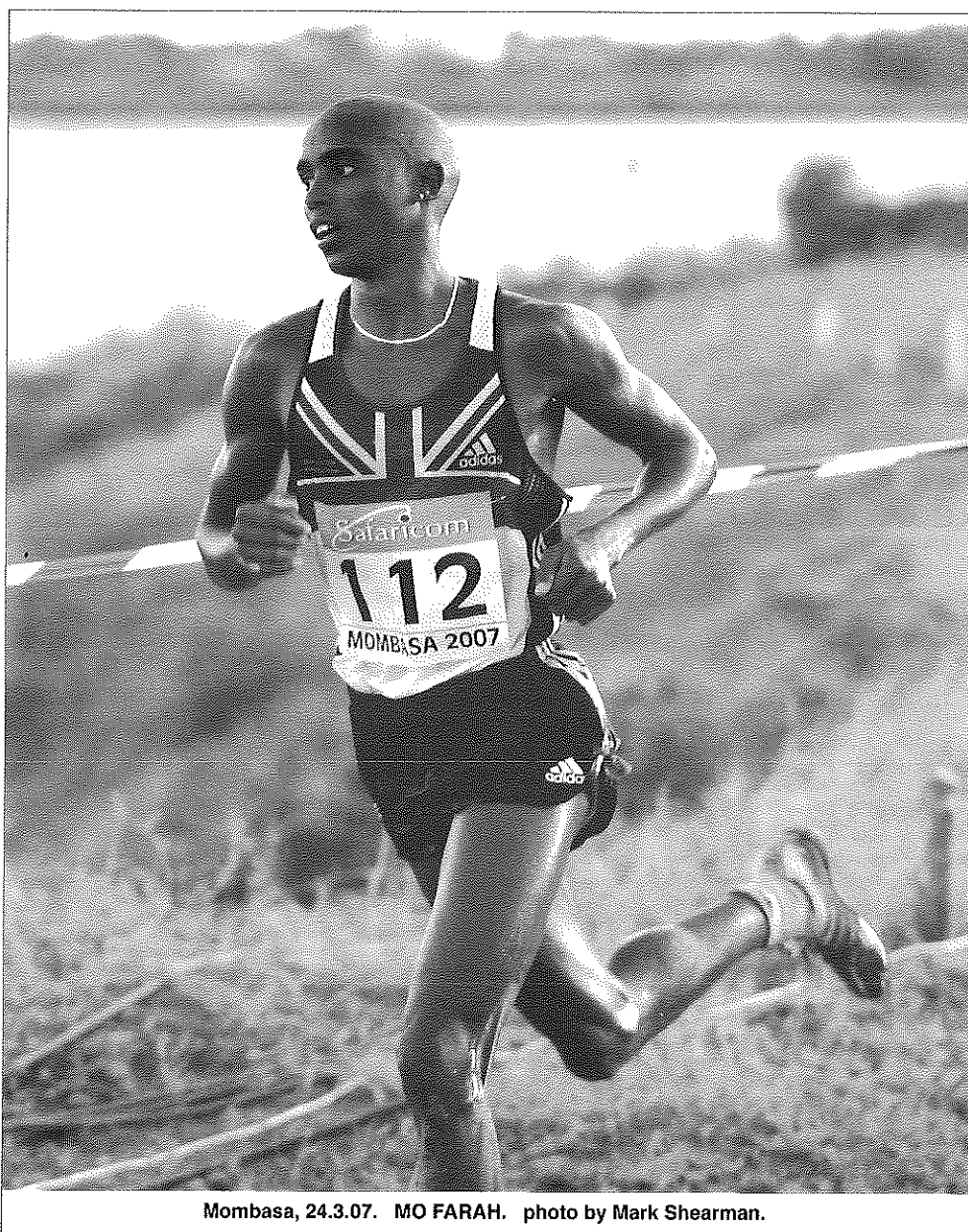
The purpose of the time-trial as opposed to the basic sessions above is that there is no recovery periods in a race and it is rare apart from races that this simulation is undertaken.

The other option, especially just before the season

commences is to do the Kosmin Test (if conditions are suitable). This is 4 x 1 minute maximal efforts with decreasing recoveries of 3, 2, 1 minutes. Starting at the point where one finishes each rep and totalling the accumulated distance ran the estimated 1500m time can be calculated by using the formula of:

$T = 500.5 - (D \times 0.162)$. Therefore if an athlete runs a total distance of 1725m the equation is $500.5 - (1725m \times 0.162) = 221$ seconds (3-41.0).

There is no magic formula for success in any event, but hard work, mental toughness, the ability to tolerate acidosis better than your opponents, a high VO₂ max and having the 'x-factor' of a superior genetic make-up to deliver searing speed when needed are some of the vital components that you will need to be the best. For the 1500m event these are vital along with a training programme that encourages quality ahead of quantity. Fast running produces fast races.



Mombasa, 24.3.07. MO FARAH. photo by Mark Shearman.

The 5,000m and 10,000m examined

David Lowes looks at the history of both events and the training implications involved in tackling them successfully

Television directors may not consider long events such as the 5000m and 10000m ideal entertainment for armchair viewers but nonetheless they have produced some of the most exciting races ever witnessed, with final laps run at unbelievable speeds.

As with all events nowadays at the highest level the athletes doing these events are specialists in their disciplines and very rarely are failed 1500m competitors moving up to 5000m or failed 5000m competitors moving up to 10000m. They run their event because they excel at it.

Both types of runners will usually have the ability to run well at many distances and on many surfaces including cross country and road running. The elite 5000m specialists will usually have 1500m times bordering on world-class and the 10000m specialists will usually have excellent 1500m times that would rank high in most countries in the world.

To run well at these distances requires great strength endurance and a huge aerobic capacity (VO2 max), the ability to concentrate for lap after lap and also to be able to run economically along with the armoury to produce a very fast finish even when extremely fatigued.

5000 metres

The men's world record of 12-39.36 by Haile Gebrselassie (Ethiopia) which was set in the summer of 1998 is up to a minute faster than great athletes such as Sandor Iharos and Vladimir Kuts were running in 1955.

The women's world record of 14-28.09 by Jiang Bo (China) which was set in the autumn of 1997 is around 46 seconds faster than GB's Paula Fudge ran in 1981. Although it is a relatively new event in terms of championship participation it has moved on rapidly and I think it will do even more so over the next five years with times equivalent to respectable regional/county levels of the men.

At the Olympic Games there have been some classic races and the ones that I can remember vividly are Mohamed Gammoudi (Tunisia) beating Kip Keino (Kenya) by the narrowest of margins at Mexico City in 1968. The Munich final in 1972 was won by Lasse Viren (Finland) from Gammoudi and was the start of his rise to prominence.

My favourite all-time 5000m however was at Montreal in 1976. Lasse Viren was victorious, running the last four laps progressively faster and close to 4 minutes. On the last lap the 'kickers' were jostling for the prime positions: Dick Quax and Rod Dixon from New Zealand, Klaus-Peter Hildenbrand from Germany and also Britain's Brendan Foster. Coming in to the final 100m Quax and Dixon who were world-class 1500m athletes were ready to pounce. However, when Viren eased away from them the look on the Kiwi's faces was one of shock!

Looking at the Olympic Games 5000m finals from 1912 to the Sydney Games in 2000 shows that out of the twenty winning performances, thirteen have been won by less than a second! The three largest winning margins have been by Joseph Guillemot (France) when beating Paavo Nurmi (Finland) by 5 seconds in 1920; the biggest winning distance was by Vladimir Kuts (USSR) from Gordon Pirie (GB) in 1956 and was an incredible 11 seconds; in 1988 John Ngugi (Kenya) won by almost 4 seconds from Dieter Baumann (Germany).

The women's 5000m has only been held twice at Olympic level, superceding the 3000m, but has produced similar winning margins as the men. Wang Junxia (China) beat Pauline Konga (Kenya) by over 3 seconds in 1996 and in 2000 Gabriela Szabo (Romania) was victorious over Sonia O'Sullivan (Ireland) by less than half a second.

Since David Moorcroft obliterated the world record of Henry Rono (Kenya) in 1982 with his still out-of-reach British record of 13-00.41 no other European has held the world record. It has been held by African athletes since 1985 when Said Aouita (Morocco) beat Moorcroft's record by one-hundredth of a second!

Aouita was the first man to break the 13 minute barrier in 1987 and since then Gebrselassie has held it four times interspersed by Moses Kiptanui (Kenya) and Daniel Komen (Kenya).

Record analysis

Gebrselassie's world record was set with metronomic lap times, a sure way to success – economical running. Close analysis of his record shows that the average lap time is 60.74 seconds. Equate that to training sessions and anyone with aspirations of such a performance must be capable of doing at least: 25 x 200m in 30.37 seconds;

12 x 400m in 60.74 seconds + 200m in 30.37 seconds; 6 x 800m in 2-01.49 + 200m in 30.37 seconds; 3 x 1600m in 4-02.99 + 200m in 30.37 seconds – with extremely short recoveries – but in this case as this is the world record breakdown there are no recoveries!

More illustrative of how good the record really is, is to look at it in terms of 1500m pace - 3-47.80 – a time which many senior men fail achieve, let alone doing it three times consecutively with an extra 500m at the end for good measure!

Jiang Bo's world record also makes interesting reading with average lap times of 69.44 seconds.

The training data relevant to that performance is: 25 x 200m in 34.72 seconds; 12 x 400m in 69.44 seconds + 200m in 34.72 seconds; 6 x 800m in 2-18.89 + 200m in 34.72 seconds; 3 x 1600m in 4-37.78 + 200m in 34.72 seconds – again with no recoveries! At even pace it equates to running a 1500m in 4-20.42, a time many females cannot aspire to, let alone doing it three times plus a 500m without any rest!

Progression

Looking at the progression of the men's world record over an 86 year period shows how much the event has moved on – almost two minutes, which equates to almost two full laps of running!



Birmingham, 4.3.07. JO PAVEY leads the 3km. final. photo by Mark Shearman.

Men

12-39.36	Haile Gebrselassie (ETH)	13/06/98
12-39.74	Daniel Komen (KEN)	22/08/97
12-41.86	Haile Gebrselassie (ETH)	13/08/97
12-44.39	Haile Gebrselassie (ETH)	16/08/95
12-55.30	Moses Kiptanui (KEN)	08/06/95
12-56.96	Haile Gebrselassie (ETH)	04/06/94
12-58.39	Said Aouita (MAR)	22/07/87
13-00.40	Said Aouita (MAR)	27/07/85
13-00.41	David Moorcroft (GBR)	07/07/82
13-06.20	Henry Rono (KEN)	13/08/81
13-08.40	Henry Rono (KEN)	08/04/78
13-12.90	Dick Quax (NZL)	05/07/77
13-13.00	Emile Puttemans (BEL)	20/09/72
13-16.40	Lasse Viren (FIN)	14/09/72
13-16.60	Ron Clarke (AUS)	05/07/66
13-24.20	Kipchoge Kieno (KEN)	30/11/65
13-25.80	Ron Clarke (AUS)	04/06/65
13-33.60	Ron Clarke (AUS)	01/02/65
13-34.80	Ron Clarke (AUS)	16/01/65
13-35.00	Vladmir Kuts (SOV)	13/10/57
13-36.80	Gordon Pirie (GBR)	19/06/56
13-40.60	Sandor Iharos (HUN)	23/10/55
13-46.80	Vladimir Kuts (SOV)	18/09/55
13-50.80	Sandor Iharos (HUN)	10/09/55
13-51.20	Vladimir Kuts (SOV)	23/10/54
13-51.60	Christopher Chataway (GBR)	13/10/54
13-56.60	Vladimir Kuts (SOV)	29/08/54
13-57.20	Emil Zatopek (TCH)	30/05/54
13-58.40	Gunder Hagg (SWE)	20/09/42
14-08.80	Taisto Maki (FIN)	16/06/39
14-17.00	Lauri Lehtinen (FIN)	19/06/32
14-28.40	Paavo Nurmi (FIN)	19/06/24
14-35.40	Paavo Nurmi (FIN)	12/09/22
14-36.60	Hannes Kolehmainen (FIN)	10/07/12

The first man to run under 14 minutes was Gunder Hagg in 1942, a time that stood for 12 years. Today, in this country, the majority of county championships are usually run much slower than that and even regional finals don't usually approach this kind of time, which shows what a great athlete Hagg was.

Woman's 5000m

For female's, the 5000m is a relatively new event, especially at major games. It has taken over from the 3000m as the championship event at world level and unlike the men it has not been dominated by African runners so far. That trend may soon change with the current crop of talented athletes coming through the ranks.

The following is the embryonic list of 5000m world record holders to date and although Bo's record is deemed brilliant I

am sure this will be broken soon.

Women

14-28.09	Jiang Bo (CHI)	23/10/97
14-31.27	Dong Yanmei (CHI)	21/10/97
14-36.45	Fernando Ribeiro (POR)	22/07/95
14-37.33	Ingrid Kristiansen (NOR)	05/08/86
14-48.07	Zola Budd (GBR)	26/08/85
14-58.89	Ingrid Kristiansen (NOR)	28/06/84
15-08.26	Mary Decker-Slaney (USA)	05/06/82
15-14.51	Paula Fudge (GBR)	13/09/81

Energy Sources

The energy sources for the 5000m are generally stated as being 80% aerobic and 20% anaerobic. Fox and Matthews analysed it as being 93% aerobic, 7% lactate and 1% ATP-PC with a VO₂ max of around 97%. The training required therefore includes long endurance and speed and is classed as 85% of maximum effort (Martin and Coe).

The make-up for a 5000m runner is someone with excellent endurance and speed (especially as the majority of championships are won in the last 100m). At major games level there is usually a heat and a final to be encountered, therefore endurance is required in abundance to reach the final in tip-top shape. Speed must be electrifying to win a medal of any kind these days unless you are capable of a world or near world record in that final.

Anyone who is stepping up from 1500m to 5000m will be running over three times further than their usual distance. Therefore much more endurance based training will be required along with a different mental approach which includes a more intense focus in terms of concentration. This means accepting discomfort, albeit at a lower intensity in a race for much longer periods of time than your competitors to ensure success.

As in any event the athlete must be ready for any eventuality in a race and this can be compounded in the 5000m by having a fast pace all of the way; mid-race burst; slow/fast surges; fast finishes. Restraint in pace judgement is essential and the athlete who runs the most economical will usually have the better chance of running fast when it matters at the end of the race by having more energy resources in reserve.

To get to the major target of the season in the best shape possible means racing at other distances that will complement the 121/2 laps. This means contesting 1500m races, 3000m races and even a 10000m race to cover all the options that you may encounter. These races intersperse 5000m 'dress-rehearsals' and usually between 3-5 are

required to reach peak performance.

Considering beforehand how your competitors may run their race is essential for your own success. Running to your strengths is essential and many incidents can happen over the 5000m distance. However, weather conditions can affect performance and also the final outcome much more than a 1500m. Strong winds can sap your strength if you decide to run from the front. Hot weather will have a major bearing on times and final positions if you are not prepared physically and hydrated adequately.

Sessions

Specific sessions for someone aiming for 13 minutes for 5000m (62.4 seconds per 400m) which cover speed, speed endurance and strength endurance could be as follows:

Speed

- 5 (4 x 200m) in 24 seconds with 2-3 mins recovery;
- 4 (4 x 300m) in 38 seconds with 3 mins recovery;
- 3 (3 x 400m) in 52 seconds with 3 mins recovery;
- 2 (2 x 600m) in 80 seconds with 3 mins recovery;
- (all with approximately 8-10 minutes between sets).

Speed Endurance

- 2 (6 x 400m) in 55 seconds with 2 mins recovery;
- 2 (4 x 600m) in 84 seconds with 2 mins recovery;
- 2 (3 x 800m) in 1-55 with 2 mins recovery;
- 2 (2 x 1000m) in 2-25 with 2 mins recovery;
- 2 (2 x 1200m) in 2-57 with 2 mins recovery;
- 2 x 1600m in 3-58 with 2 mins recovery;
- (all with approximately 5 minutes between sets).

Strength Endurance

- 14 x 400m in 60 seconds with 30-45 secs recovery;
- 9 x 600m in 91 seconds with 30-45 secs recovery;
- 7 x 800m in 2-02 with 30-45 secs recovery;
- 6 x 1000m in 2-33 with 30-45 secs recovery;
- 5 x 1200m in 3-04 with 30-45 secs recovery;
- 4 x 1600m in 4-06 with 30-45 secs recovery.

Lactate levels

Lactate levels of around 6-10 mmol/l are common in a 5000m race and these athletes will have very high VO₂ max levels and good lactate tolerance systems.

There is a much slower build-up of acidosis in a 5000m unlike the 800m or 1500m where the lactic acid increases quickly and dilutes the athletes abilities in the final stages of a race (usually the last 100m-200m).

The lactic acid accumulation can be accelerated immensely if the athlete runs too quickly in the early stages or if the

pace is erratic. The need to tolerate acidosis levels longer, albeit at a much lower rate than the 800m/1500m athletes is essential for those who are 5000m specialists.

Looking more closely at the differentiation between 5000m and 1500m lap times of individual athletes (5000m specialists) some common criteria is evident which should indicate what speed you need to be running the shorter distance to succeed at the longer one.

	1500m	(per lap)	5000m	(per lap)	Diff
Moorcroft	3-33.79	(57.01)	13-00.41	(62.43)	+5.42
Gebrselassie	3-32.39	(56.63)	12-39.36	(60.74)	+4.11
Aouita	3-29.46	(55.85)	12-58.39	(62.27)	+6.42
Radcliffe	4-05.37	(65.43)	14-31.42	(69.71)	+4.28
McColgan	4-01.38	(64.36)	15-01.08	(72.08)	+7.72

The list shows that the average difference is around 4-5 seconds per 400m between 5000m and 1500m paces. Liz McColgan's massive differential of nearly eight seconds is perhaps due to the fact that 5000m wasn't a championship event when she was competing and that she ran more 3000m races.

Her 1500m is particularly good in comparison to her 5000m time and with the endurance she possessed she may well have run much quicker given the opportunity. Aouita's 1500m (world record at that time) also gives him a much bigger differential than the others.

Further analysis of the athletes above in relation to the differences between their 1500m performances and their 5000m shows some interesting statistics.

Moorcroft = 9-26.62; Gebrselassie = 9-06.07;
Aouita = 9-28.93; Radcliffe = 10-26.05;
McColgan = 10-59.70.

The men have generally around 91/2 minutes difference when classed as 1500m/5000m types. Gebrselassie's differential is much less due to his fantastic endurance capabilities at 10000m and above.

The women have a difference of around a minute more than the men which correlates with the differences in aerobic capacity of men and women (around 10 ml/kg/min). McColgan's slightly inferior time difference is probably the result of her unfulfilled potential at the 5000m event.

Athletes like Gebrselassie and Radcliffe have fantastic ranges in their repertoires. They can compete very well at 1500m and are among the best in the world at 3000m, 5000m, 10000m, half-marathon and marathon.

Some of the best 5000m athletes have also been 1500m specialists e.g. Aouita, Moorcroft, Quax and Kiemo. However, in modern day athletics there is only one athlete who has held the world record at 1500m and 5000m simultaneously and that is Said Aouita. The only other two to have the same distinction are Gunder Hagg (1942) and Paavo Nurmi (1924). Thus far, no female athlete has had the distinction of being world record holder at both events.

Huge endurance capabilities along with high levels of strength and speed endurance and mental resolves that make them almost invincible when at their best are some of the essential qualities required therefore to be the best over 5000m.

10,000 metres

Although the 5000m is an increase in distance of over three times for those moving up from the 1500m, which is perhaps a reason why many struggle with the endurance aspects of the event. The 10000m is 'only' an increase of double the distance, but the fact that it is 25 laps makes it that much more demanding not only in endurance needs, but more so in terms of mental concentration.

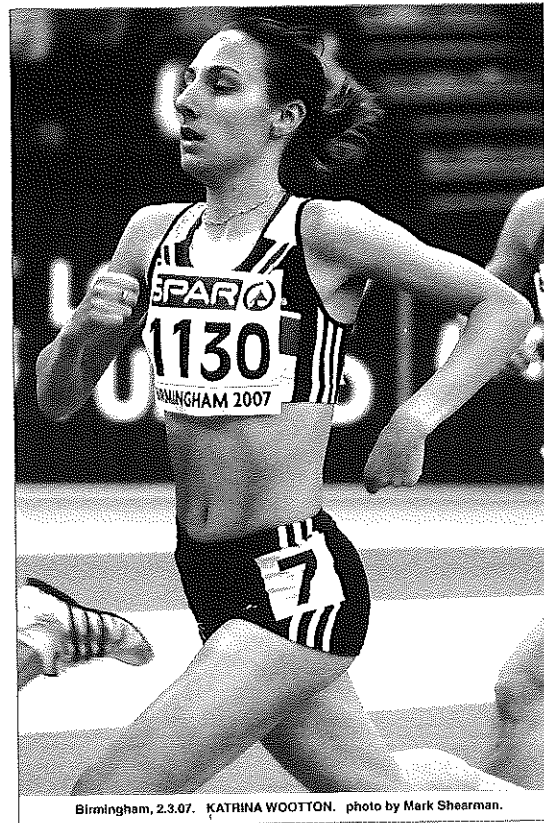
This is a major reason why many can run good 10k road races, but fail when they transfer their attentions to the track. Intense concentration is a must and losing contact in a race is very difficult to regain with any 'bad patch' being accentuated and once dropped from the leaders, control is lost and rhythm interrupted and this can make for some very uncomfortable remaining laps.

The current world record of 26-22.77 by Gebrselassie in 1998 is over 21/2 minutes faster than the legendary Emil Zatopek ran in 1954 and 68 seconds faster than our own David Bedford recorded for a world record in 1973.

Men

26-22.77	Haile Gebrselassie (ETH)	01/06/98
26-27.85	Paul Tergat (KEN)	22/08/97
26-31.32	Haile Gebrselassie (ETH)	04/07/97
26-38.08	Salah Hissou (MAR)	23/08/96
26-43.53	Haile Gebrselassie (ETH)	05/06/95
26-52.23	William Sigei (KEN)	22/07/94
26-58.38	Yobes Ondieki (KEN)	11/07/93
27-07.91	Richard Chelimo (KEN)	05/07/93
27-08.23	Arturo Barrios (MEX)	18/08/89
27-13.81	Fernando Mamede (POR)	02/07/84
27-22.50	Henry Rono (KEN)	11/06/78
27-30.50	Samson Kimombwa (KEN)	30/06/77
27-30.80	David Bedford (GBR)	13/07/73
27-38.40	Lasse Viren (FIN)	03/09/72
27-39.40	Ron Clarke (AUS)	14/07/65

28-15-60	Ron Clarke (AUS)	18/12/63
28-18.20	Pjotr Bolotnikov (SOV)	11/08/62
28-18-80	Pjotr Bolotnikov (SOV)	15/10/60
28-30.40	Vladimir Kuts (SOV)	11/09/56
28-42.80	Sandor Iharos (HUN)	15/07/56
28-54.20	Emil Zatopek (TCH)	01/06/54
29-01.60	Emil Zatopek (TCH)	01/11/53
29-02.60	Emil Zatopek (TCH)	04/08/50
29-21.20	Emil Zatopek (TCH)	22/10/49
29-27.29	Viljo Heino (FIN)	01/09/49
29-28.20	Emil Zatopek (TCH)	11/06/49
29-35.40	Viljo Heino (FIN)	25/08/44
29-52.60	Taisto Maki (FIN)	17/09/39
30-02.00	Taisto Maki (FIN)	29/09/38
30-05.60	Ilmari Salminen (FIN)	18/07/37
30-06.20	Paavo Nurmi (FIN)	31/08/24
30-23.20	Ville Ritola (FIN)	06/07/24
30-35.40	Ville Ritola (FIN)	25/05/24
30-40.20	Paavo Nurmi (FIN)	22/06/21
30-58.80	Jean Bouin (FRA)	16/11/11



Birmingham, 2.3.07. KATRINA WOOTTON. photo by Mark Shearman.

Great races

At Olympic level some of the great races that I can remember are Billy Mills (USA), Mohammed Gammoudi (Tunisia) and Ron Clarke (Australia) in Tokyo, 1964 with a second separating the trio. Both of Lasse Viren's victories in Munich 1972 and Montreal 1976 were exceptional, one of which necessitated picking himself off the track after being tripped in mid-race. Miruts Yifter's (Ethiopia) lightning quick last lap in Moscow in 1980 was awesome.

The last two Olympics have seen Gebrselassie victorious after epic battles with Paul Tergat (Kenya) with less than one second separating them on both occasions.

However, my all-time favourite 10000m race was the 1971 European Championships where Juha Vaatainen (Finland) was victorious from Jurgen Haase (GDR) with a last lap ran at an unbelievable pace. The pace just got faster and faster once the bell had sounded with the final 400m ran in around 53 seconds.

Haase ran only a half a second slower, but it wasn't good enough!

Record analysis

Like the 5000m, the 10000m at the Olympics Games has produced many close finishes and in the last four finals 1-2 seconds has separated gold from silver.

The first man to break the 27 minute barrier was Yobes Ondieki (Kenya) in 1993 and Gebrselassie has held the world record three times thus far. His current world record was ran at an incredibly even pace which at that level is probably the only way to achieve such a fantastic time.

Analysing his world record shows that the average lap time is 63.31 seconds. Interpretating that into training data produces the following mind-boggling sessions: 50 x 200m in 31.65 seconds; 25 x 400m in 63.31 seconds; 12 x 800m in 2-06.62 + 400m in 63.31 seconds; 6 x 1600m in 4-13.24 + 400m in 63.31 seconds. All of these are fantastic sessions, even with reasonably long recoveries, but with 26-22.77 you don't get any at all!

The world record at present of 29-31.78 by Wang Junxia (China) set in 1993 is over 2 minutes faster than Mary Decker-Slaney (USA) ran 11 years previously.

These examples show how much standards have improved. No one would have thought that when Bedford did his world record Gebrselassie would have lapped him if they had been around at the same time!

Women

29-31.78	Wang Junxia (CHI)	08/09/93
30-13.74	Ingrid Kristiansen (NOR)	05/07/86
30-59.42	Ingrid Kristiansen (NOR)	27/07/85
31-13.78	Olga Bondarenko (SOV)	24/06/84
31-27.57	Raisa Sadretdinova (SOV)	07/09/83
31-35.01	Ludmila Bragina (SOV)	29/05/83
31-35.30	Mary Decker-Slaney (USA)	16/07/82
32-17.19	Jelena Sipatova (SOV)	19/09/81

The women's Olympic finals which have been held since 1988 have produced differences of between 5 seconds and less than a second to claim the gold or only get the silver.

Junxia's world record requires averaging 400m laps in 70.87 seconds. Interpreted into training data the sessions look like this:

50 x 200m in 35.43 seconds; 25 x 400m in 70.87 seconds; 12 x 800m in 2-21.74 + 400m in 70.87 seconds; 6 x 1600m in 4-43.48 + 400m in 70.87 seconds. This relates to running 1500m in 4-25.76 x 6 + 1000m in 2-57.17 - all of these examples are done with no rest whatsoever.

For the 10000m the energy sources are stated as 90% aerobic and 10% anaerobic. Fox and Matthews analysis is 97% aerobic, 3% lactate and around 1% ATP-PC with the VO2 max being in the region of 92%. The training needs are long endurance and speed although not as intense as the 5000m.

Tactics

The 25 laps may be a boring event to some, but it allows for varying tactics due to its longevity. Obvious tactics such as front running have to be employed only by the super confident and extremely fit athlete i.e Paula Radcliffe. Waiting until the final stages (last 3k, 2k or 1k) are for the athletes who haven't got terrific sprint finishes but who can wind the pace up sufficiently to diminish the finishes of the sprinters. Surges are quite common if done sensibly at specific points in the race as lactate accumulation isn't as severe as in the shorter distances.

As in all races there are athletes who will try to sit and wait until they know the race is theirs for the taking. These athletes can frustrate the others by having no involvement in the race strategy for 24 laps. For those who can employ this strategy, it is a very economical and wise way to run by running as close to 10000m as possible by running in the shadow of the other competitors and thus protecting themselves from any wind resistance.

Athletes who run 10000m can have a much better chance of running a very swift last lap due to the slower albeit tiring pace of the preceding 24 laps with much less acidosis being built up. However, these athletes must have great powers of concentration and awareness and must be excellent rhythm runners by being able to churn out laps at a metronomic pace.

At the very highest level these athletes will be world-class at 5000m as well as 3000m and also at the longer half-marathon distance. However with all their endurance backgrounds speed will not be neglected as is evident by the closeness of the medallists at the major championships.

Sessions

Specific sessions for a 27 minute 10000m (64.8 seconds) the athlete must be capable of at least sessions such as:

Speed

4 (6 x 300m) in 40 seconds with 2 mins recovery;
3 (5 x 400m) in 54 seconds with 3mins recovery;
2 (4 x 600m) in 84 seconds with 3 mins recovery;
(all with approximately 8-10 minutes between sets).

Speed Endurance

2 (8 x 400m) in 58 seconds with 2 mins recovery;
2 (6 x 600m) in 87 seconds with 2 mins recovery;
2 (5 x 800m) in 1-58 with 2 mins recovery;
2 (4 x 1000m) in 2-30 with 2 mins recovery;
2 (3 x 1200m) in 3-02 with 2 mins recovery;
3 x 1600m in 4-06 with 2 mins recovery;
2 x 2000m in 5-10 with 2 mins recovery;
(all with approximately 7-8 minutes between sets).

Strength Endurance

28 x 400m in 63 seconds with 30-45 secs recovery;
18 x 600m in 95 seconds with 30-45 secs recovery;
14 x 800m in 2-07 with 30-45 secs recovery;
12 x 1000m in 2-38 with 30-45 secs recovery;
10 x 1200m in 3-10 with 30-45 secs recovery;
8 x 1600m in 4-13 with 30-45 secs recovery;
6 x 2000m in 5-18 with 30-45 secs recovery.

The lactate levels in the 10000m are usually around 4-6 mmol/l and strength and aerobic endurance play a major role in the successful competitor.

In major championships there can be heats to qualify for the final and this can be extremely demanding for certain athletes who haven't got fast finishes and therefore need to qualify by running swiftly. The effort produced to qualify can be detrimental to the athletes performance in the final by leaving their best form in the qualifier.

Looking at the difference in lap times between 5000m and 10000m from the following list shows margins of around 21/2 seconds per athlete.

	5000m	(per lap)	10000m	(per lap)	Diff
Viren	13-16.40	(63.71)	27-38.40	(66.33)	+2.62
Gebrselassie	12-39.36	(60.74)	26-22.77	(63.31)	+2.57
Rono	13-06.20	(62.89)	27-22.50	(65.70)	+2.81
Clarke	13-16.60	(63.72)	27-39.40	(66.37)	+2.65
Kristiansen	14-37.89	(70.18)	30-13.74	(72.54)	+2.36
Radcliffe	14-31.42	(69.71)	30-01.09	(72.04)	+2.33
McColgan	15-01.08	(72.08)	30-57.07	(74.28)	+2.20

This difference is quite small in relation to the time run and suggests two things: (a) some of them have the capability to go much faster over the shorter distance and (b) that their strength endurance and aerobic capacity is extremely high

and that they are proficient at running economically with high levels of concentration.

Analysis of the athletes above in relation to the differences in performances between their 5000m and 10000m events shows some interesting statistics.

Viren = 14-22.00; Gebrselassie = 13-43.41;
Rono = 14-07.30; Clarke = 14-22.8;
Kristiansen = 15-35.85; Radcliffe = 15-30.48;
McColgan = 15-55.99.

The men have differences of around 14-00 to 14-20 apart from Gebrselassie whose 13-43.41 shows how much better his strength/speed endurance is than the others.

The women illustrated are quite close in comparison with around 15 1/2 minutes being the norm and McColgan's 5000m throwing the equation out slightly. However, like the 1500m/5000m comparison the difference between the genders of the 5000m/10000m is still around a minute which shows how good the endurance levels of the elite females are.

Similarities

The best 10000m athletes over the years have also been 5000m specialists e.g. Gebrselassie, Tergat, Hissou (Morocco), Rono, Clarke, Radcliffe and Kristiansen (Norway) etc. and many of these have had the capabilities to be world-class at the marathon as well. There have been many world record holders of both the 5000m and 10000m and these are: Gebrselassie, Rono, Viren, Clarke, Kuts, Iharos, Zatopek, Maki and Nurmi for the men and Kristiansen and Decker-Slaney for the women.

Therefore it is obvious that the 5000m and 10000m have many similarities in physiological make-up although psychologically they can be poles apart. There have been many outstanding 5000m athletes who could not come to terms with 25 laps of a track, but had no problem with 10k on the roads or cross country. The concentration span for a 25 lapper is immense and if this is not in the athletes mind-set, then it will be very hard to succeed.

Looking at the 10000m from a psychological aspect can be likened to a drinking glass with a capacity of 200ml filled with 100ml of water. Is it half full (positive thinking) or is it half empty (negative thinking)? Likewise after 4000m, the positive athlete will be aware there are 15 laps to go, but will be thinking that 10 laps have been completed successfully and that things are going well. The negative athlete will be thinking of each one of the 15 laps to go and may well be thinking of how he/she is going to be feeling after another 5-6 laps.

The 10000m can be soul-destroying for many competitors who tow the field around for 24 laps and get torn-apart over one single 400m. Unfortunately, unless you have the capability and confidence to build up a huge lead before the bell, it is more often than not going to come down to who can sprint the fastest when tired. With the lower lactic acid build-up these finishes are sometimes very fast indeed.

Training

Endurance training will be high priority, but speed must never be neglected and certain sessions will reflect this need by operating at multi-pace i.e. 3k, 1500m and 800m paces. Aerobic running in the form of long runs, OBLA runs and interval running will make up a large percentage of the training plan and this is the main provider for aerobic capacity (VO2 max).

The difficulty with the make-up of an ultra-fast 10000m athlete for many is the huge endurance capacity married with lightning fast speed capabilities. The archetype will have slow twitch fibres in abundance (endurance) and a good selection of Type IIa fast twitch fibres (speed/ endurance) that will 'fire' when called upon at the end of the race.

Both the 5000m and 10000m athletes are generally very much ectomorphs (thin/skinny) with good power/weight ratios. This means that they can devour the ground with minimal energy loss through good compact styles (economy).

Both events can be time-consuming in relation to training sessions with high numbers of reps and longish distances for some of the event specific sessions. For the 10000m, especially a strength endurance session, the athlete needs to be completing at least 10000m worth of work and probably some additional work on top of that to acclimatise the body to the stresses, strains and mental anguish that 25 laps can produce.

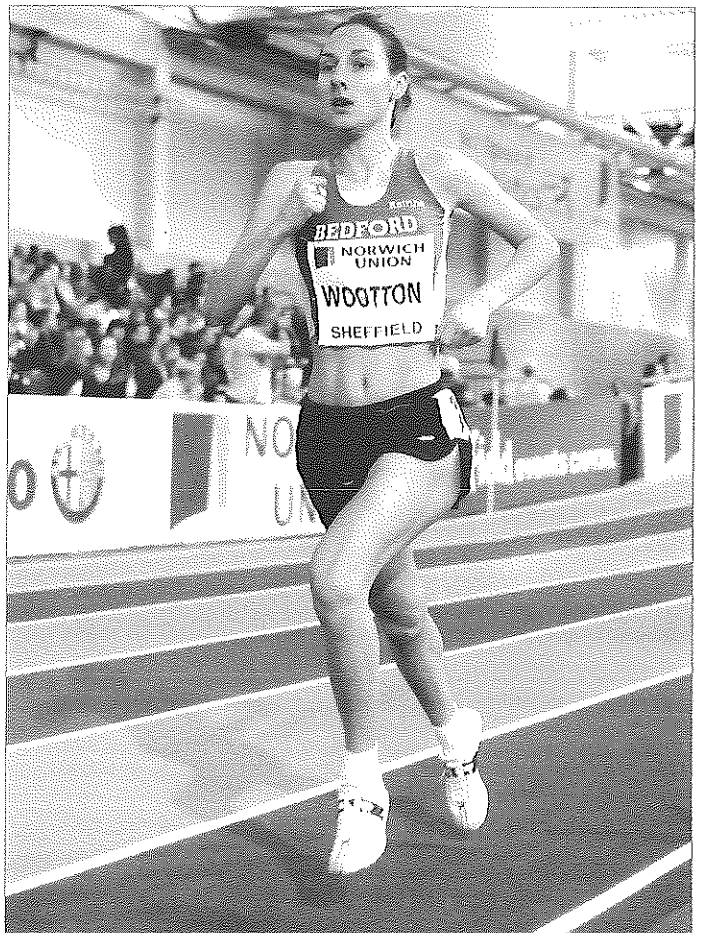
Winter and Summer

For a successful summer in both of these events will usually, but not always, mean having a good winter's training and competition (cross-country and road running). The training differences between the winter and summer months will not be as marked as a 1500m or 800m runner, but specific sessions for specific targets (championships) will mirror the needs of that race or its possible competitors (tactical training).

It is wise not only to practise speed sessions for fast finishes but also to keep speed levels high as this is the longest championship event on the track ... and the next distance after the 10000m is the marathon ... which is over four times further!



Birmingham, 17.2.07. JO PAVEY (Gt. Britain) on her way to winning the 2 miles in a UK record time of 9 mins. 32 secs. with LISA DOBRISKEY (Gt. Britain) finishing second in 9 mins. 33.78 secs. photograph by Mark Shearman.



Sheffield, 11.2.07. KATRINA WOOTTON. photo by Mark Shearman.

"I haven't a clue what my mileage is..."

by Frank Horwill

The above observation was made in an interview with an athletics magazine by Kelly Holmes some ten years before she achieved her double in the 2004 Olympics. At the time she had just broken the U.K. records for 800 and 1500 metres. The journal that conducted the quiz was a monthly one and there were quite a few of these around at the time so that the interview was not widely available to the domestic running fraternity.

When asked how she accrued her endurance her reply must have made some high volume adherents cringe with disbelief. Her road runs were confined to three a week and were duration orientated: 1 hour easy, 45 minutes faster and 30 minutes very fast. At a rough guess this could be around 22 miles a week or 25 miles at most.

Then came what many think is superior to big mileage at conversational pace, two or three repetitions between 3k and 5k pace over a 2,500 metres course mostly on grass but could involve grass, road and track. According to Dudley's research, a mile at 3k speed is worth 8x1 mile of steady running and 5k speed is more efficient than 4 miles of steady running. So, a rough mileage correlation for this particular session is between 36 and 18 miles and probably averages out at 27 miles if repeated three times. Dudley's calculations were based on the percentage increases of mitochondria, the more you accumulate the better you will run. Even though Dudley's work had to pass four scrutinising committees there are those who dismiss the findings and stick to traditional beliefs which unfortunately aren't making much impact on the performances of African runners. Their attitude was described by the late Harry Wilson, Ovet's coach and a host of others, in a lecture. Banging the blackboard with one hand he declared, "There will always be some who will say this board is not black, it's dark blue or volcanic."

But, the sting in the tail of Kelly's endurance background is the fanatical use of hills. She must have searched far and wide to find the hills she required: long and gradual, long and steep, short and gradual, short and steep and multiple hills where one immediately followed another. For each different hill there was a different kind of training be it full out to the top or full effort from halfway or maximum speed up a third from the start. One of the first ever meaningful bits of research to investigate the efficiency of different training sessions was conducted by the Soviet physiologists, Urogenstein, Viru and Pisuke, 35 years ago and involved 94 physical education students being divided into groups of a dozen, with each group being given a particular type of training session to perform daily and included steady running for 45 minutes, very fast 200 metre repetitions with 200m jog recovery, not so fast reps, at 200m with 100m jog, full out sprints to 60 metres and walk back, 600m fast runs with good recovery and running up and down hill with a 1 in 15 incline. All the students were fitness tested before embarking on the 6-week regime and comprehensively blood tested. On conclusion of the routine all athletes were subjected to a running test over 600 metres and lesser distances plus extensive blood tests. All groups improved, however, the group that improved the most was the hill one who simply ran up and down the hill any old how for 30 minutes daily closely followed by the short rest 200 squad and the longer rest 200 runners. The steady runners improved the least, an astonishing result since one lot did only sprinting. But, we now know that if the experiment had continued for 12 weeks instead of 6 weeks the steady runners would have done better.

Kelly's obsession with hill training certainly paid off. Her track training was remarkably short in duration but intensely fast and rarely exceeded 400 metres in distance. Over the latter part of her career under the guidance of Mo Jennings, an admirer of Seb Coe's training regime, it is not fully known how her routine altered, if at all. One thing that never changed was her addiction to all forms of strength training be it loose weights, fixed weights and circuits, no doubt a routine she developed as an army N.C.O. physical training instructor. The definition of her abdominal muscles was extraordinary.

Col. Glen Grant, a BMC Vice President, relates a story about Kelly's distaste of choosing the easy option. It was the national army 1500 metres championship and as the U.K. record holder she would have little difficulty in retaining her title. She asked permission to run in the men's race and defeated two-thirds of the field.

Perhaps Kelly can be persuaded to enlarge her much publicised young female coaching squad to include young male aspirants – it's a long time since our males have got within two seconds of Cram's 1500 metres time and within three seconds of Coe's 800 metres time set more than twenty years ago.

The half marathon and marathon examined

by David Lowes

David Lowes looks at the development of the two races that did so much to make running a mass participation sport and the training that is needed to tackle them seriously.

Whereas in track racing everyone covers the same 400m lap in an anti-clockwise direction on a perfectly flat running surface, the half and full marathons are run on the roads in varying directions of the compass. These surfaces may be concrete, tarmac, including some cobblestones or off-road terrain and for major championships most finish in a stadium on a synthetic running surface.

Courses can be point-to-point (not accepted for record purposes), start and finish at the same place and start and finish in slightly different places in the same town/city.

On the track, in middle and long distance races, if you run faster than anyone else has ever done in history you will be heralded as a world record holder.

On the roads if your time is faster than anyone has ever run you will be the proud owner of a world best time. This is because every course is different and in reality it is only a 'world record' for a particular route. However, from January 2004, the IAAF will recognise them as world-records.



Birmingham, 3.3.07. HELEN CLITHEROE (Gt. Britain, 1111) leads in the women's 1500m. Final from the eventual winner LIDIA CHOJECKA (Poland, 1221) and SONJA ROMAN (Slovenia, 1307) who finished seventh. photograph by Mark Shearman.

Point-to-point courses are dismissed for records due to prevailing winds and some courses are discounted due to dropping too much in elevation from start to finish. Course measurement is vital and the set-up has to be such that the athletes can only run the intended distance with no corner cutting. In most big city and championship races the courses are marked with a line on the road and this is what the athletes have to follow, deviating from it incurs extra distance.

The world's best athletes who are running these distances will invariably be specialists not only at either or both of these events but also at a variety of distances on many varying surfaces. Almost all of the top runner's will be world-class on the track at 10000m and some will also be world-class at 5000m and many will be to the forefront as the world's best at cross country.

The day's are long gone when a marathon runner was good only at marathon running, the world bests now dictate much more than a stereotypical one-paced runner.

Although aerobic capacity (VO2 Max) is the main requirement to run well over these long distances it is

essential to be able to concentrate for much longer than track races. It is undoubtedly imperative to have a strong mental toughness as many doubts can enter the mind in these races and it is important to know exactly what pace you are running at. Speed cannot be neglected as many races are won in the last 400 metres - it can be soul-destroying if you have led for most of the way, only to get pipped with the finish line in sight.

The marathon

The marathon has probably the greatest history of any other event. It is 26 miles 385 yards (42.195 km) and is over four times further than the next major games running event, the 10000m. It is the only event to still retain imperial measurements whilst all other events are calibrated metrically.

The history books tell us that in 490BC, a Greek messenger called Pheidippides ran from Marathon to Athens (around 23 1/2 miles) to tell of the news that the Athenians had defeated the Persians in a great battle. On his arrival in Athens he announced the news to the city elders and collapsed and died!

The legend has survived many differing versions of what actually happened, and the inaugural 1896 Olympic Games in Athens included the Marathon which was won by the Greek, Spiridon Louis over a distance of around 25 miles.

The first time the now standard distance of 26 miles 385 yards was run was in the Olympic Games of 1908 in London when the event was due to start in Windsor and finish at the White City Stadium. The race started on the lawns of Windsor Castle so that the children of the Royal Family could see the runners and it ended opposite the Royal Box in the Stadium so that the Queen could see the runners cross the finish line.

The actual race was etched in history as the diminutive Italian, Dorando Pietri entered the stadium in the lead but was so extremely fatigued that he fell to the track exhausted 200 yards from the finish. He was helped to his feet and struggled to around 50 yards from the finishing line where he collapsed again. At this point another competitor entered the stadium and Pietri summoned one last effort and got through the winning post.

After been carried away on a stretcher he recovered sufficiently well to hear that he had been disqualified for having illegal assistance. The actual winner was the American, Johnny Hayes, but in the eyes of the crowd there was only one winner.

The distance between Windsor and the Royal Box was measured and found to be the now standard marathon distance and although the Olympic Games of 1912 and 1920 were held over slightly differing distances, the 1924 Games were held over the odd distance and it has been so ever since.

Close finish

The present men's world best of 2-04.55 by Paul Tergat of Kenya was set in Berlin in 2003 and he only won by 1 second from compatriot Sammy Korir. It is over 7 minutes faster than the great Abebe Bikila from Ethiopia ran in the Tokyo Olympics in 1964, well over 2k in terms of distance.

The women's world best of 2-15.25 by Britain's prodigious Paula Radcliffe was also set in the London Marathon in 2003 and is over three minutes better than anyone else has ever achieved, apart from her 2-17.18 in Chicago. Related to distance it is over 800m clear of the next fastest Catherine Ndereba from Kenya.

There have been many marathons in Olympic history that have left lasting memories for different reasons. Some of these are: 1952 – Emil Zatopek's first marathon after his

successes at 5000m and 10000m in the same games. He ran stride for stride with Britain's Jim Peters and he commented: 'the pace is it fast enough?' Jim Peters pronounced 'no, it is too slow!' Zatopek then proceeded to disappear into the distance, coming home 21/2 minutes clear with Peters dropping out at around 20 miles.

The Rome Olympics of 1960 heralded the unknown Abebe Bikila, who ran the race barefooted. He repeated his success four years later in 1964 in a then world best time and triumphed by over 4 minutes and proceeded to do calisthenics on the infield to show everyone just how fresh he was!

In 1976 Waldemar Cierpinski from East Germany won in an Olympic record and repeated his success in 1980 in a close finish. Carlos Lopes from Portugal won in 1984 in 2-09.21 which still stands as the Olympic record to date. In 1996 a surprise winner from South Africa, Josiah Thugwane won in the closest finish in Olympic history from Lee Bong-Ju of Korea, just three seconds separating them.

In the women's Olympic marathon, which was included for the first time in 1984, Joan Benoit, USA won in 2-24.52, a time that would not be beaten until the Sydney games of 2000 when Naoko Takahashi of Japan won in 2-23.14. This was also one of the closest finishes with only 8 seconds separating her from Lidia Simon of Romania.

There have been many great marathon races in championships and 'big city' races but the ones that rate high on my list of all-time favourites are Bikila's 1964 Tokyo Olympic gold medal/world best performance; Steve Jones's 1984 Chicago world record run; the 2003 London marathon where five athletes entered the Mall together and at the finish only 14 seconds separated the first seven, with only 1 second between first and third. Who said that you don't need speed for a marathon?

The results of the London race were:

1. G. Abera (ETH) 2:07:56;
2. S. Baldini (ITA) 2:07:56;
3. J. Ngolepus (KEN) 2:07:57;
4. P. Tergat (KEN) 2:07:59;
5. S. Ramadhani (TAN) 2:08:01;
6. A. El Mouaziz (MOR) 2:08:03;
7. L. Bong-Ju (KOR) 2:08:10.

I am sure that with 800m remaining Abera would be thinking confidently that he could win it, while some of the other competitors may have had different thoughts. El Mouaziz for example, may have been thinking 'should I have pushed the pace 5000m earlier' or 'if I go now will I be able

to maintain the pace and destroy the field or myself? Big decisions, which only the athletes know instinctively if they will work or not.

Finally and perhaps top of the list, is every marathon Paula Radcliffe has run thus far, inspirational, extraordinary, phenomenal, there are not enough superlatives to describe how she runs them.

Amazing statistics

At Olympic level the women's race has interestingly been won by athletes from different continents: USA, Europe (twice). Africa and Asia. The men's race has also seen the following countries win the gold medal over the last 10 Olympics: USA, Asia, Africa (four) and Europe (four).

Paul Tergat's world best when broken down into average pace and session data makes mind-blowing reading for athletes of all abilities. It is the equivalent of running a half marathon in 62-27 and then continuing at the same pace for another one.

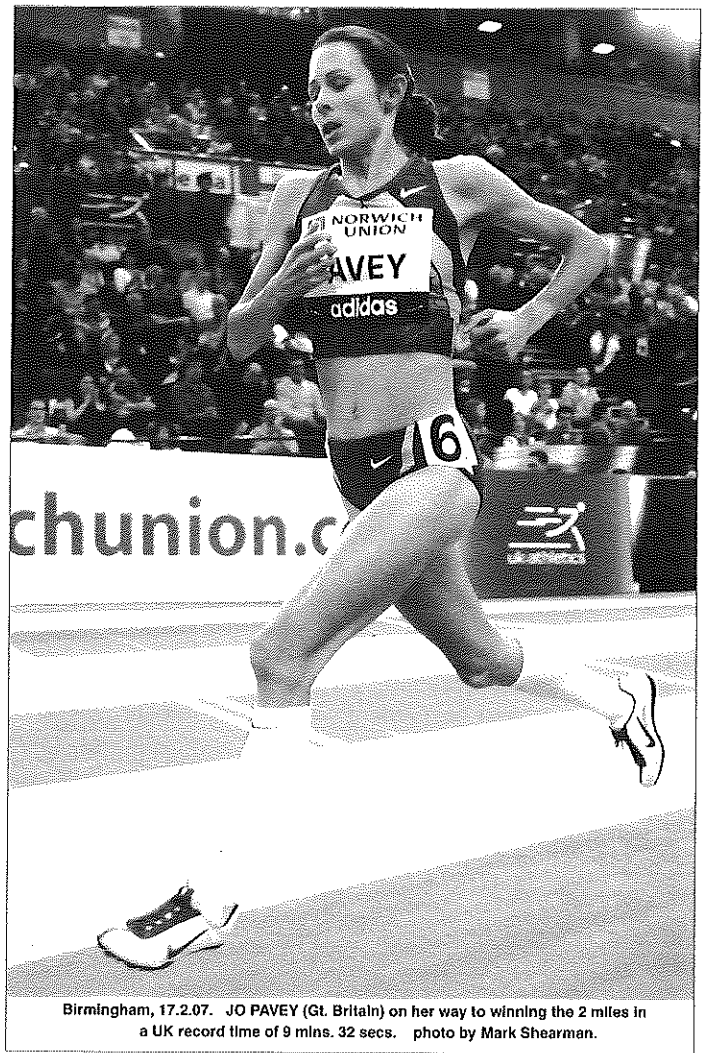
Broken down into kilometre splits it equates to around 2 minutes 57 seconds for 42 consecutive repetitions or around 4-46 per mile. Now we can begin to see the picture as to how good the record is.

The following dissection of the record reveals even more unbelievable statistics: 211 x 200m in 35.5 seconds; 105 x 400m in 71 seconds; 52 x 800m in 2-22; 26 x 1600m in 4-44; 14 x 3000m in 8-51; 6 x 5000m in 14-48; 4 x 10000m in 29-36. Great sessions, and yes, you've guessed it, no recoveries!

These are obviously out of the reach for 99.9% of athletes. You can however quite easily get a taste of how brilliant the record is by attempting as many 100m efforts without rest in 17.75 seconds. Tergat did 422 consecutive efforts in his epic marathon.

Paul Radcliffe's monumental 2-15.25 seconds in London makes just as fantastic reading. It equates at even pace to 67-42 for a half marathon x 2 with kilometre splits of 3 minutes 12 seconds x 42 with mile times of 5 minutes 10 seconds x 26.

The hypothetical training sessions (without recovery) would be: 211 x 200m in 38.5 seconds; 105 x 400m in 77 seconds; 52 x 800m in 2-34; 26 x 1600m in 5-08; 14 x 3000m in 9-36; 8 x 5000m in 16-00; 4 x 10000m in 32-00. If there is any doubt in anyone's mind (male's included) how good her record is then trying running at 19.25 seconds per 100m for as long as you can ... if you get to 422



Birmingham, 17.2.07. JO PAVEY (Gt. Britain) on her way to winning the 2 miles in a UK record time of 9 mins. 32 secs. photo by Mark Shearman.

repetitions then you will not only have equalled the record but also put yourself very high up the UK Men's rankings!

The progression of the men's world best over the last 83 years shows an improvement of around 28 minutes, almost six miles worth of running at Tergat's pace and the following list shows how it has evolved over the years.

Men

2-04.55	Paul Tergat (KEN)	28/09/03
2-05.38	Khalid Khannouchi (MAR)	14/04/02
2-05.42	Khalid Khannouchi (MAR)	24/10/99
2-06.05	Ronaldo de Costa (BRA)	20/09/98
2-06.50	Belayneh Dinsamo (ETH)	17/04/88
2-07.12	Carlos Lopes (POR)	20/04/85
2-08.05	Steve Jones (GBR)	21/10/84
2-08.18	Rob de Castella (AUS)	06/12/81
2-08.34	Derek Clayton (AUS)	30/05/69
2-09.36	Derek Clayton (AUS)	03/12/67
2-11.00	Morio Shigematsu (JPN)	12/06/65
2-12.11	Abebe Bikila (ETH)	21/10/64
2-13.55	Basil Heatley (GBR)	13/06/64
2-14.28	Leonard Edelen (USA)	15/06/63
2-15.15	Toru Terasawa (JPN)	17/02/63
2-15.16	Abebe Bikila (ETH)	10/09/60

2-15.17	Sergey Popov (SOV)	24/08/58	2-42.42	Liane Winter (GER)	21/04/75
2-17.39	Jim Peters (GBR)	26/06/54	2-43.54	Jacqueline Hansen (USA)	01/12/74
2-18.34	Jim Peters (GBR)	04/10/53	2-46.24	Chantal Langlace (FRA)	27/10/74
2-18.40	Jim Peters (GBR)	13/06/53	2-46.30	Adrienne Beame (AUS)	31/08/71
2-20.42	Jim Peters (GBR)	14/06/52	3-01.42	Elizabeth Bonner (USA)	09/05/71
2-25.39	Yun Bok Suh (KOR)	19/04/47	3-02.53	Caroline Walker (USA)	28/06/70
2-26.42	Kitei Son (JPN)	03/11/35	3-07.26	Anni Pede (GER)	16/07/67
2-26.44	Yashuo Ikenaka (JPN)	03/04/35	3-15.22	Maureen Wilton (CAN)	16/05/67
2-27.49	Fushashige Suzuki (JPN)	31/03/35	3-19.33	Mildred Sampson (NZ)	21/07/64
2-29.01	Albert Michelson (USA)	12/10/25	3-27.45	Dale Greig (GBR)	23/05/64
2-32.35	Hannes Kolehmainen (FIN)	22/08/20			

The first man to run under 2-20 in 1953 was Britain's Jim Peters and the first to break 2-10 was Australia's Derek Clayton in 1967. Since Clayton broke his world best again with 2-8.34 two years later it stood for 12 years without improvement until another Australian Rob de Castella shaved 16 seconds from it. The record improved gradually until Belayneh Dinsamo from Ethiopia ran 2-06.50 in 1988 and this stood for 10 years without any revision. In the last five years it has improved gradually and now sub-2-04 must not be too far away.

Female marathon running has improved immensely over the last 39 years since Britain's Dale Greig ran 3-27.45. Paula Radcliffe has ran an amazing 1 hour 12 minutes faster – around the time it takes her to cover almost 14 miles in a marathon!

The women's list shows how quickly it has progressed, due mainly to much harder training and a stronger mental approach, especially since it has been a major games event since 1984. Who would have thought that nine times New York City marathon winner Grete Waitz would be over 10 minutes slower than Radcliffe?

Women

2-15.25	Paula Radcliffe (GBR)	13/04/03
2-17.18	Paula Radcliffe (GBR)	13/10/02
2-18.47	Catherine Ndereba (KEN)	07/10/01
2-19.46	Naoko Takahashi (JPN)	30/09/01
2-20.43	Tegla Loroupe (KEN)	26/09/99
2-20.47	Tegla Loroupe (KEN)	19/04/98
2-21.06	Ingrid Kristiansen (NOR)	21/04/85
2-22.42	Joan Benoit (USA)	18/04/83
2-25.29	Grete Waitz (NOR)	17/04/83
2-25.29	Allison Roe (NZ)	28/10/81
2-25.41	Grete Waitz (NOR)	26/10/80
2-27.32	Grete Waitz (NOR)	21/10/79
2-32.29	Grete Waitz (NOR)	22/10/78
2-34.47	Christina Vahlensieck (GER)	10/09/77
2-35.15	Chantal Langlace (FRA)	01/05/77
2-38.19	Jacqueline Hansen (USA)	12/10/75
2-40.15	Christa Vahlensieck (GER)	03/05/75

The record for women has improved by large amounts almost every 1-3 years since 1964 until 1985 when Ingrid Kristiansen of Norway ran 2-21.06, which was to survive for 13 years until Kenya's Tegla Loroupe ran 2-20.47 in 1998. However, since 2001 it has improved every year with the record being taken to new heights and it is now considered so good that it is a time many would-be male elite athletes cannot achieve!

The energy sources for the marathon are generally stated as being 98% aerobic and 2% anaerobic. Fox and Matthews analysis is 99% aerobic, <1% lactate and <1% ATP-PC with a VO2 max of around 80%. The training required therefore includes much long endurance with speed included as strength doesn't always win marathons – Tergat's world best was only achieved with a 1 second victory – the difference between immortality and anonymity.

In both gender's, the make-up of the elite marathoner has changed over the years and now the athletes who are capable of world-best times are multi-race specialists as opposed to runners of yesteryear who generally only had their major success over their specialist distance.

Similarities

The similarities between Tergat and Radcliffe are uncanny. They are both the world's fastest at marathon and half-marathon, they are among the fastest ever at 5000m and 10000m, both are multi-victorious at the world cross country championship (Tergat 5 times, Radcliffe 2 times) and both have won the World Half Marathon Championship (Tergat once and Radcliffe 3 times). They have differed somewhat in their success rates at the marathon distance. Tergat has taken six attempts to win his first marathon, although all his times have been world class. Radcliffe has been an instant success, winning all three with two world-best times and the fastest debut which places her fourth on the all-time list behind Catherine Ndereba and herself!

This is now becoming the essential criteria needed to achieve or beat the world-best times of today. Huge endurance capabilities with pace and mental resolves that

can be maintained for extremely long periods.

There is a problem for marathoners in relation to racing and training preparation. If we consider the racing programmes of a 1500m athlete, he/she will include 800m races for speed and 3000m for strength improvements. Likewise, a 5000m specialist will incorporate 1500m for speed and 10000m for extra strength gains.

The marathoner however cannot race any longer than their specialist distance unless they considered an ultra-marathon. Racing under-distance in relation to their event is also difficult as the next bona-fide distance is a half-marathon. Some athletes like to run a 20 mile road race around six weeks before their major target – personally I think it is a waste of time. If the athlete were to run well then it proves only what they already know, that they are going well, something they would know from their training performances and the effort produced could be detrimental to their ultimate peak performance.

Therefore, as in any event the impetus for the specialist event is gained through multi-pace training. For the marathon this includes slower than marathon race pace, marathon pace, half marathon pace, 10k pace, 5k pace and some 3k pace sessions.

Build-up

The other big consideration for marathon athletes is the length of their long runs in their specific event build-up period of 12-16 weeks as opposed to the ratios of other event disciplines. 1500m specialists will regularly run 10-15 miles, 5000m and 10000m specialists will think nothing of 15-20 mile runs. However, many marathoners will run below their racing distance with runs around 22-24 miles. Some will do 26-30 mile runs once a week. What is important is running above race prediction time e.g. 2-15 race target; 2-45 training time. This acclimatizes the body to utilize its carbohydrate (glycogen) supplies better to get you through the marathon distance.

When carbohydrate stores begin to run low the body has to look for other sources of energy. Fats are readily available, but less efficient. When the pace drops dramatically it is sometimes called 'hitting the wall'. It can feel much worse than that with loss of control of the legs and dizziness some of the factors. The fitter you are and the better prepared through long runs the transition to the alternative fuel (fat metabolism) should be fairly smooth.

It is therefore imperative to be well hydrated before a marathon and have carbohydrate stores high in the form of glycogen. It is wise to have some carbohydrate mixed in your

drinks as water only quenches thirst and does not replenish diminishing energy levels. Considering that you can lose between 2-4 litres of fluid through sweat in races of over 2 hours duration, it is absolutely vital to be well hydrated if you want to be running fast and not 'crawling' in the final two miles.

Some specific sessions for a marathoner who is aiming for a time around 2 hours 8 minutes are as follows:

Strength Endurance

20 x 800m in 2-20 with 30 seconds recovery
16 x 1000m in 3-00 with 30 seconds recovery
10 x 1600m in 4-50 with 30-40 seconds recovery
8 x 2000m in 6-00 with 40-50 seconds recovery
5 x 3000m in 9-00 with 40-50 seconds recovery

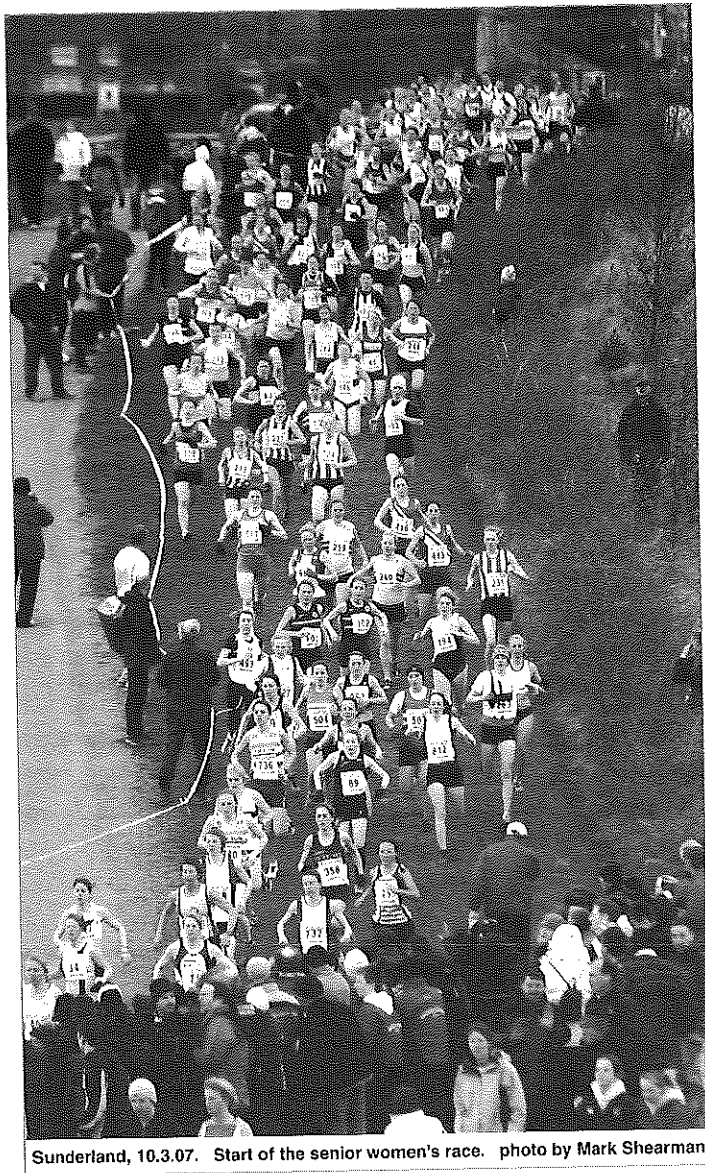
The athlete who harbours success in the marathon will have generous amounts of ST fibres, excellent efficiency and a low lactate production even when working with high loading.

Fatigue is common when training for the marathon with high rep/low recovery sessions interspersed by long and medium length runs and too much fatigue can lead to injury and exhaustion. There are many who leave their training gains in the training plan and when it comes to race day they under-perform because of this.

A week in an elite marathoner's mid-specific preparation could look like the following:

Sunday	2 hour 45 minute steady run (<marathon pace)
Monday	(am) 30-40 minute run (marathon pace) (pm) 20 x 800m (half marathon pace)
Tuesday	(am) 30-40 minute run (marathon pace) (pm) 1 hour 15 minute run (<marathon pace)
Wednesday	(am) 30-40 minute run (marathon pace) (pm) 1 hour 15 minute run (>marathon pace)
Thursday	(am) 30-40 minute run (marathon pace) (pm) 1 hour 15 minute run (30 minutes @ half marathon pace)
Friday	(am) 30-40 minute run (marathon pace) (pm) 30-40 minute run (marathon pace)
Saturday	5 x 3000m (half marathon pace)

The reason why athletes run well in their race is not necessarily because how much they have put into a 12-week block (event specific fine tuning) but because of the accumulated training effect of 1, 2, 3 or more years, although the months before the race will have a huge impact



Sunderland, 10.3.07. Start of the senior women's race. photo by Mark Shearman.

both physically and mentally.

There are many other considerations to take account of such as: practising drinking on the run (an art in itself), comfortable clothing and shoes (don't wear brand new kit on the day), pace judgement (even paced running). All of these can slow and ruin your hard, time-consuming training and you can't run a marathon every week unlike an 800m or 1500m. Around a maximum of two marathons a year is considered the limit for elite athletes to allow for the training before and the recovery after each one.

Hydration before a marathon and during is vital with some carbohydrate added to your water to keep the diminishing glycogen stores as high as possible. Once carbohydrate stores start to drop with fatigue the fatty acids will increase their role as energy providers. This is why women long distance runners (marathon and above) can potentially get much closer to the men's times in comparison to the shorter distances due to their increased fat content.

Weather conditions can affect a marathon more than any

other event and if it is hot in particular, some acclimatisation and adjustment to pace will have to be made. Big city marathons tend to be held at sensible times of the year, but major games marathons can be held in stifling heat and humidity and it is not always the best athlete who wins but the one who can tolerate the conditions better.

By examining the differences between half-marathon and marathon times of some of the world's best ever athletes shows some interesting criteria which may be hypothetical, but nonetheless indicates the capabilities of the athletes.

	42.2 km	21.1 km	Diff
Tergat	2-04.55	59-06	65-49
Gebrselassie	2-06.35	60-03	66-32
Radcliffe	2-15.25	65-40	69-45
Kristiansen	2-21.06	66-40	74-26

Tergat who has the world best times for both events has a differential of 65-49 whilst Hailie Gebrselassie has a difference of 66-32 which is down to his only debut run at the marathon and his inactivity at the half marathon distance. He is surely the type of athlete who could take the record below the 2-04 barrier?

Radcliffe's half marathon time suggests she can go much faster over the full marathon distance given the right conditions and course (Berlin?). Kristiansen's much bigger differential suggests she had much more in store to run a sub 2-20 marathon.

The one thing that they all have in common is that they are/were excellent track and cross country runners as well, thus having the pace, strength and mental toughness required for the marathon.

Negative splits

Most of the top athletes run negative splits these days and this is considered to be the best way to conserve energy for the later stages. Paul Tergat ran around 63-01 to the halfway point and then speeded up to a 61-54 second half in Berlin.

Tergat is the only man in history to have held the 10000m world record, the half marathon and marathon world bests albeit at different periods. Ingrid Kristiansen has gone one better with the 5000m and 10000m world records and half marathon and marathon world bests.

Like all records, the times have moved on considerably and in 1981 when the male world best was 2-08.18, Britain's Ron Hill stated: "People have talked about the possibility of a 2 hour marathon, but I think 2-05 would be a more realistic limit ... it will be achieved by a 10000m runner who is

motivated towards the marathon". How accurate that prediction has turned out to be ... so far ...

Tom Osler's predictions for world records in 'The Serious Runner's Handbook' (1978) stated that the male record would be 2-05.46 in 2000 and 2-04.27 in 2010, very erudite prophecies. He also stated that the 2 hour barrier will be broken in the year 2030, so watch this space!

The half-marathon

The half marathon is 13 miles 1921/2 yards (21.1 km) and is not a major games event, although it has its own world championship event which has been held since 1992.

Elite marathoners are generally world-class at the half marathon, but half marathoners are not always world-class at the marathon. This is due to the fact that they are probably more suited to the shorter distance and are more than likely to excel at 10000m with the half marathon being used as a preparatory base for their specialist distance.

There is much confusion as to who actually holds the world best records due to inaccuracies of courses, invalid point-to-point routes and courses that assist the athletes by dropping too much in elevation (downhill). Tergat holds the official world best of 59-17, his 59-06 was set on a course that dropped 40 metres from start to finish.

The following times are among the fastest ever run on any course, though not necessarily world-best times, and illustrate the unbelievable paces set by those athletes and what speed requirements are needed for a largely aerobic event.

Men

59-06	Paul Tergat (KEN)	26/03/00
59-20	Hendrick Ramaala (RSA)	26/03/00
59-31	Patrick Ivuti (KEN)	26/03/00
59-38	Faustin Baha (TAN)	26/03/00
59-40	Haile Gebrselassie (ETH)	24/03/02
59-43	Antonio Pinto (POR)	15/03/98
59-47	Moses Tanui (KEN)	03/04/93
59-51	William Kiplagat (KEN)	26/03/00
59-51	Tesfaye Tola (ETH)	12/06/00
59-52	Fabian Roncero (ESP)	01/04/01

Paul Tergat's 59-06 when dissected into average pace segments makes you realise what type of athlete it is that can run a time such as that.

It is the equivalent of running 10000m in 28 minutes, a time only one British athlete bettered on the track in 2003 and repeating it again plus another kilometre for good

measure. Broken down into kilometre splits it equates to around 2 minutes 48 seconds for 21 consecutive repetitions or around 4-30 per mile.

If you thought the marathon statistics were thought provoking then these are truly out of this world: 105 x 200m in 33.6 seconds; 52 x 400m in 67.2 seconds; 26 x 800m in 2-14.4; 13 x 1600m in 4-28.9; 7 x 3000m in 8-24; 4 x 5000m in 14-00 - good sessions with medium to long recoveries and 3000m and 5000m times that most good county standard athletes would like to achieve, but with no recoveries they are almost not believable!

Like the marathon illustration try running as many 100m efforts without recovery in 16.8 seconds (world best pace) to get an idea of what pace is required - 210 repetitions is your target!

Paula Radcliffe's 65-40 run in the 2003 Great North Run on a point-to-point course also makes you appreciate what a fantastic athlete she is. Elana Meyer's 66-44 from South Africa is recognised as the fastest legal time so far.

Paula's time equates at even pace to around 31-07 for a 10000m x 2 with kilometre splits of 3 minutes 06 seconds repeated 21 times and average mile times of 5 minutes x 13.

The training session statistics (without recovery) are: 105 x 200m in 37.3 seconds; 52 x 400m in

74.7 seconds; 26 x 800m in 2-29.4; 13 x 1600m in 4-58.7; 7 x 3000m in 9-20; 4 x 5000m in 15-33.

If you want to get a 'feel' of her half marathon pace try as many 100m efforts at 18.7 seconds without recovery and see how far you can get.

Women

1-05.40	Paula Radcliffe (GBR)	21/09/03
1-05.44	Susan Chepkemei (KEN)	01/04/01
1-06.34	Lornah Kiplagat (KEN)	01/04/01
1-06.40	Ingrid Kristiansen (NOR)	06/04/87
1-06.43	Masako Chiba (JPN)	19/01/97
1-06.44	Elana Meyer (RSA)	15/01/99
1-06.47	Paula Radcliffe (GBR)	07/10/01
1-06.49	Esther Wanjiru (KEN)	15/01/99
1-07.03	Deratu Tulu (ETH)	01/04/01
1-07.11	Liz McColgan (GBR)	26/01/92
1-07.12	Tegla Loroupe (KEN)	10/03/96
1-07.19	Sonia O'Sullivan (IRL)	28/11/69

A phenomena for a lot of half marathon races is that many athletes tend to run pb 10 mile times en-route, which shows

how many approach this distance with fast paces set from the outset.

The half marathon is a true test of aerobic strength and running at pace for a long period and even pace is vitally important so that you don't run out of gas at around the 10 mile point. Although it is possible to run an excellent half marathon without specific sessions by using 5000m and 10000m specific work as the base, here is some of the work that could be incorporated as a specific training unit for a 60 minute aspirant:

Strength Endurance

30 x 400m in 64 seconds with 30 seconds recovery
 15 x 800m in 2-12 with 40-50 seconds recovery
 12 x 1000m in 2-40 with 40-50 seconds recovery
 8 x 1500m in 4-10 with 50-60 seconds recovery
 6 x 2000m in 5-35 with 60-70 seconds recovery
 4 x 3000m in 8-25 with 60-70 seconds recovery

A sample week of an elite performer training for a half marathon could look something similar to this:

Sunday	1 hour 45 minute steady run (< marathon pace)
Monday	(am) 30 minute run (> marathon pace) (pm) 30 x 400m (5k pace)
Tuesday	(am) 30 minute run (> marathon pace) (pm) 1 hour run (marathon pace)
Wednesday	(am) 30 minute run (> marathon pace) (pm) 1 hour 10 minute run (30 minutes @ 21.1k pace)
Thursday	(am) 30 minute run (marathon pace) (pm) 6 x 2000m (10k pace)
Friday	(am) 30 minute run (marathon pace) (pm) 40 minute run (marathon pace)
Saturday	15 x 800m (10k pace)

Both marathoner's and half marathoner's will incur week's of extremely high mileages with much quality specific work included and someone like Paula Radcliffe is reputed to have totted up week's as high as 145 miles. This is for someone who is, or is capable of being the best in the world at every distance from 3000m up to the marathon and also for someone who is easily capable of running under 4 minutes for 1500 metres if she decided to concentrate on that distance!

Due to the half marathon being only a world championship event and not on the Olympic list of events, it is fair to say that half marathoners are usually specialists in other events, namely 5000m and 10000m. Marathoners however, may have their event as the major focus and everything else

could be part of the jigsaw leading to success over 42.2km, although as mentioned earlier, the elite marathoners are elite at many different events on many surfaces.

A look at the past winners of the world half marathon championship looks like a who's who of distance running:

Men

1992	Benson Masya (KEN)	60-24
1993	Vincent Rousseau (BEL)	61-06
1994	Khalid Skah (MAR)	60-27
1995	Moses Tanui (KEN)	61-45
1996	Stefano Baldini (ITA)	61-17
1997	Shem Kororia (KEN)	59-56
1998	Paul Koech (KEN)	60-01
1999	Paul Tergat (KEN)	61-50
2000	Paul Tergat (KEN)	63-47
2001	Haile Gebrselassie (ETH)	60-03
2002	Paul Kosgei (KEN)	60-39
2003	Martin Lel (KEN)	60-49

In the team race (three to count, accumulated time), Kenya hold the record with 2-59.54 set in 1997, which equates to an average of 59-58.

Women

1992	Liz McColgan (GBR)	68-53
1993	Conceicao Ferreira (POR)	70-07
1994	Elana Meyer (RSA)	68-36
1995	Valentina Egorova (RUS)	69-58
1996	Ren Xiujuan (CHN)	70-39
1997	Tegla Loroupe (KEN)	68-14
1998	Tegla Loroupe (KEN)	68-29
1999	Tegla Loroupe (KEN)	68-48
2000	Paula Radcliffe (GBR)	69-07
2001	Paula Radcliffe (GBR)	66-47
2002	Berhane Adere (ETH)	69-47
2003	Paula Radcliffe (GBR)	67-35

The team race record is 3-27.40 set in 1997 by Romania and equalled in 1999 by Kenya, which equates to an average of 69-13.

In theory, half marathoners should have a large proportion of slow twitch fibres as it is predominantly an aerobic event. But to run the times of the world's best athletes requires much 'long' speed and the fast twitch Type IIa endurance related fibres will be much in use. The top athletes will usually include heavy mileage in their schedules but not without quality speed specific sessions.

Differences

As in all events economy is the essence to running well and although marathoners may need a 'flatter' style with a lower

centre of gravity to propel them through two hours of running, the half marathoner can run effectively with more of a 'track' cadence due to the much shorter time ran.

There are major differences between the two events and track racing in that there are usually no space restrictions when running due to a wide road whilst on the track everyone is vying for the inside two lanes. Also there may be uphill and downhill to negotiate, many corners to turn and it is possible, though unlucky for the athlete, that the whole run could be into a headwind (point-to-point course).

Many big city type races can have large crowds along most of the course and although this can be exhilarating, it can also make the athlete run too fast too early in the race by getting engrossed in the atmosphere.

Both events are extremely popular with the masses and they are events where the novice can line-up with the superstars, unlike track races, where they will generally be seeded. They

capture the imagination of the public and get the nation up and running if only for 'fun' and 'health'.

The future of both events is down to multi-event specialists with world-class track times at 5000m and 10000m an absolute necessity. Both male and female world-best aspirants will be the fastest or among the fastest ever over those distances. The training required will get more complex with multi-pace training and extremely high mileages. Perhaps the career of the marathoner in particular will get shorter due to the excesses of the training load taking its toll in the form of injury and burnout.

No-one can forecast the times of the future accurately for these two events, however to run sub 59 minutes and sub 2 hours 4 minutes for the men and sub 65 minutes and sub 2 hours 14 minutes for the women will require athletes with very special talents. Whether these times will be achieved soon is anyone's guess, but there are athletes who have the capabilities at the moment to get very close.



Sheffield, 18.2.07. HANNAH ENGLAND wins the 1500m. at the UKA City Challenge final.
photograph by Mark Shearman.

BMC Nike Grand Prix 2007

The dates for the BMC / Nike Grand Prix series for 2007 are:-.

Saturday June 9th	Sports City - Manchester
Saturday June 30th	Watford
Saturday July 21st	Solihull
Saturday August 11th	Trafford
Saturday August 25th	Grand Prix Final - Crystal Palace

You will notice that we are not staging a meeting in May this year. This is because the World Championship is very late in the season and we have geared the fixtures round this. We believe we have five strong venues and good dates that do not clash with other major fixtures.

Through the whole series we will be aiming to have top quality pacemakers from the PACE sports agency. UKA have agreed to fund this for the first two meeting as they see them as key fixtures for the achievement of World Championship and European Junior qualification.

To further encourage a strong entry and encourage fast times we will be offering prizes of up to £1000.

Prize Money 2007			Standards			
1st	2nd	3rd	M800m	M1500m	W800m	W1500m
150	100	60	01:48.5	03:42.0	02:04.5	04:17.0
250	150	100	01:47.5	03:40.0	02:03.0	04:14.0
400	250	150	01:47.0	03:38.0	02:02.0	04:11.0
600	400	200	01:46.0	03:36.0	02:01.0	04:08.0
1000	600	400	01:45.5	03:35.0	02:00.0	04:05.0

The Manchester Sports City meeting will be the last major domestic opportunity for athletes to impress the selectors before the Norwich Union Great Britain and Northern Ireland teams are named for the European Cup. Manchester will also include the women's 5000m trial race for the European Juniors

The traditionally strong Watford and Solihull meeting will hope to exceed the high quality of last year which saw four European qualification times. Watford will host the World Championship 10000m trial. Solihull will include the Peter Coe and Frank Horwill miles for U17 men and women.

Trafford which for many years has staged highly successful BMC Gold Standard meetings will for the first time host a Grand Prix meeting. This will be a special meeting featuring a celebration of the 50th anniversary of Derek Ibotson's World Mile record. This meeting will also include a match between the Irish Milers Club and BMC teams from England, Scotland and Wales. The IMC hosted this fixture last year and came out the victors.

The fifth fixture will be the BMC Final at Crystal Palace incorporating the UK Challenge Final. 800m winners and the first two in the 1500m at the first four fixtures will qualify for automatic places in the Final A race. In this meeting we will have the Nike men's mile and the Bowerman Women's mile. Prizes of £1000 are on offer to the first Britain under 4 minutes and 4:30 respectively.

Track stats

The National Union of Track Statisticians have updated their list of sub-four minute milers and miles in the latest edition of "Track Stats". As at December 2006 there have been 1529 races, including 410 indoors, of course it is unlikely that the list is better than 99.9% correct but every effort has been made to keep the list in order. The club now includes 1031 men from 61 countries, they have registered 4938 performances of which 944 were made indoors. The majority of men are from the USA, a total of

279 (this includes imports), UK next with 166, followed by Kenya 101 and south Africa with 51. Given the gradual demise of the one mile with its 1500m replacement the opportunity to join the club has become less available but noting that given its rough equivalent is 3:42 we are not missing a deluge of new names, sadly.

BMC Awards 2006

Coach of the year

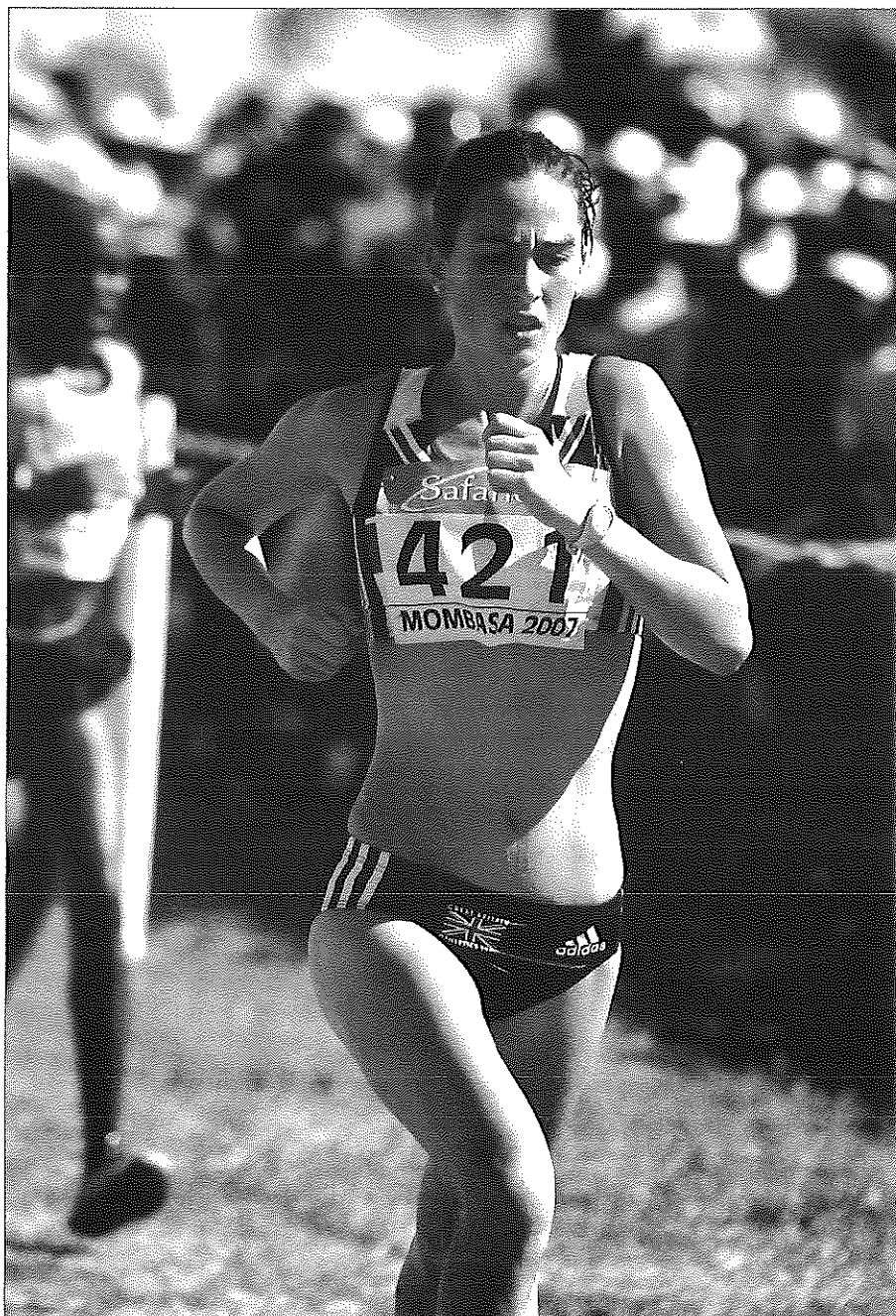
David Farrow

Athlete of the year

Becky Lyne

Young athlete

Steph Twell



Mombasa, 24.3.07. EMILY PIDGEON. photo by Mark Shearman.



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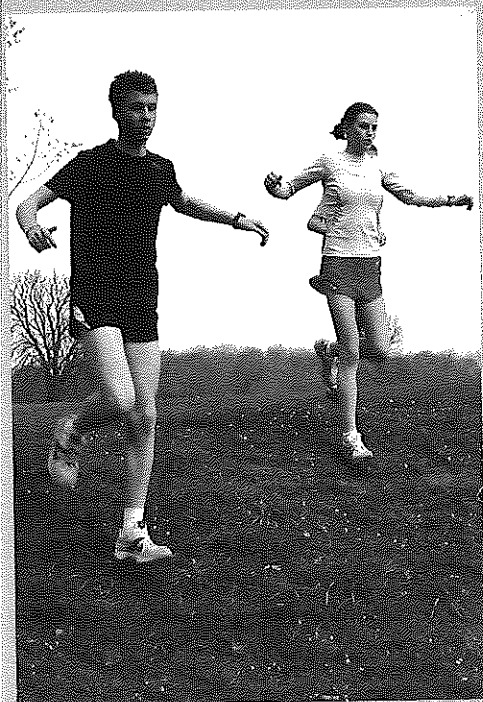
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- Provide information on further opportunities available.
- Provide top-class coaching and advice where required.
- Ensure that all BMC activities are open to all communities (equal opportunities).

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 Gender: _____
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 E-Mail: _____
 Academy Member: Yes No
 Membership Number: _____

Does your child suffer from any of the following?
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 Fainting Heart Problems Migraines Allergies
 Other: _____

Is your child currently on medication or have any injuries?
 Yes No If yes, please specify:

Do you consider your child to have a disability?
 Yes No If yes, please specify:

What is your child's Ethnic origin?
 White Mixed Race Asian Black Chinese
 Other

Do you object to photographs of your child being taken for publicity purposes? (NSPCC guidelines)
 Yes No

Club: _____

Special Dietary requirements (please state):

 Please state pb's (for squad allocation): 800m _____
 1500m _____ 3000m _____

For Coaches Only:
 What is your current UKA coaching level? _____
 Please enclose photocopy of licence.

Do you have a UKA CRB certificate? Yes No
 Please enclose photocopy of certificate. (If no, please contact Rod Lock on 0238 078 9041 immediately)

For Parents: BMC courses involve vigorous, but beneficial athletic training, to a high standard. Please confirm that your child is physically fit and capable of participation in this training over the duration of the course. A qualified masseur/sports therapist will be in attendance to deal with minor niggles, muscle soreness or athletic related problems. Please note that we will only treat a person under the age of 18 if a chaperone is present (friend or fellow athlete/personal coach). Do you give permission for your child to be treated?
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 Emergency Contact No: _____
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Signed _____ Date _____

*Information used in this form will be used to monitor and evaluate BMC activities. All information will remain confidential and no reference to individuals will be made in written or verbal reports. Your child's participation is voluntary and you may decline to participate. I have read and understood the above information and agree for my child or myself to participate further in this study, if so requested.

UK indoor rankings 2007

Compiled by Athletics Data
www.athleticsdata.com

Any comments to
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Overall Men

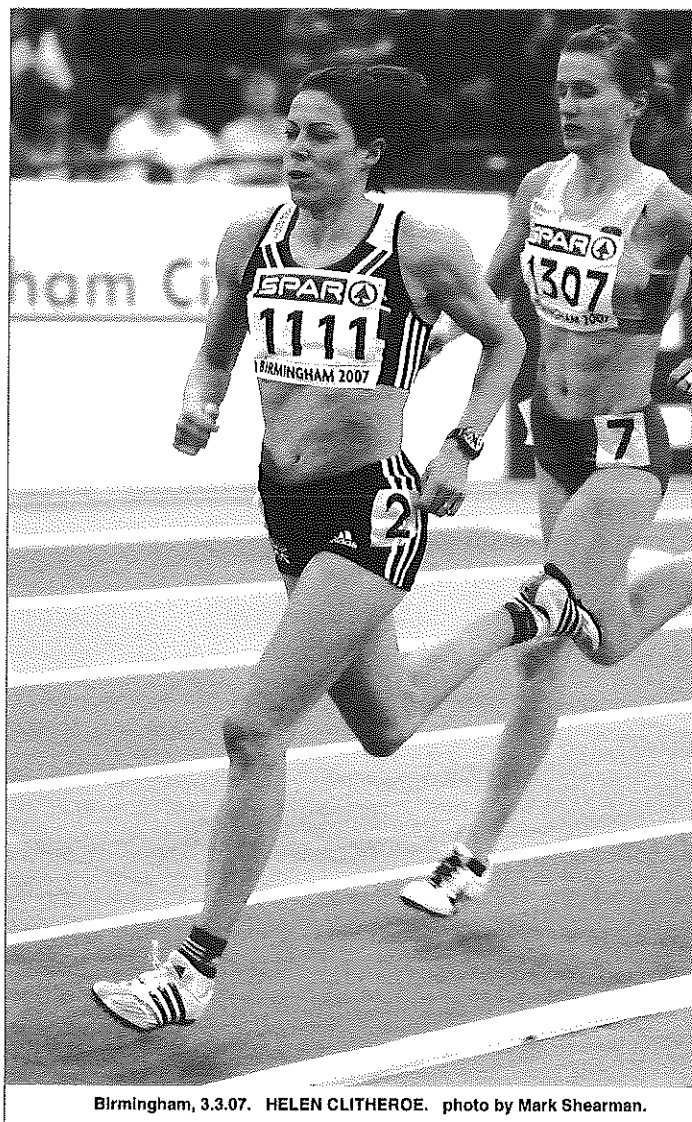
800

1:48.52 Richard Hill Notts
1:48.75 James Brewer Chelt
1:48.84 James McIlroy WSEH
1:48.92 James Nasrat Newp
1:49.27 Chris Reynolds WG&EL
1:49.58 David Proctor Roch
1:49.91 Chris Gowell Swan
1:50.09 Ben Green Warr
1:50.23 Darren St. Clair E&H
1:50.3 Graeme Oudney Belg
1:51.01 Neil Dougal TVH
1:51.12 Andrew Osagie Harl
1:51.20 Andrew Brown WG&EL
1:51.23 Daniel Stepney Phoe
1:51.94 Joe Thomas Card
1:52.01 James Mills Wrex
1:52.05 Kevin Kane C'nauld
1:52.55 Chris Saville Herts P
1:52.76 Drew Graham Gosf
1:52.88 Ed Aston C&C
1:52.97 Nicky Moore Kilb
1:53.02 Joseph Maynard Card
1:53.28 Chris Bryant Wig D
1:53.3 Matthew Turner Shett
1:53.33 David Harmer M&M
1:53.4 Ben Harding Ports
1:53.59 Tom Carter Vale R
1:53.66 Michael Dyer N Down
1:53.80 Tom Druce Cl
1:53.81 Ieuan Thomas Cwmb
1:54.17 Matt Warley Chelt
1:54.22 Kevin McCloy Mid U
1:54.27 Paul Bradshaw B'burn
1:54.40 Andrew Gibson Kilb
1:54.44 Rick Beardsell Traff
1:54.51 Chris Warburton Notts

1:54.71 Michael Cole N Dev
1:54.8 Rick Ward Norw
1:55.04 Craig Houston CoE
1:55.08 Martin Flook B&W
1:55.20 Daniel Beier Norw
1:55.28 Anthony Gray Birm R
1:55.31 Andrew Clements WSEH

1:56.19 Matt Wood B'burn
1:56.24 Simon Wray P&B
1:56.25 Chris Brown Mans
1:56.43 Steven Sinclair Cov
1:57.1 Mark Woodley Chelm
1:57.19 Tom Penfold Bir
1:57.19 James Miller Chelt

1:58.55 Anthony Bird SSH
1:58.57 Martin Reid Sheff
1:58.59 Fabian Downs Chilt
1:58.66 Dan Bartlett Bath
1:58.69 Liam McCully Liv H
1:58.7 Richard Buck York
1:58.7 Nick Beer Sheff U
1:58.73 Davey Platt N Dev
1:58.77 Rory Campbell High
1:58.85 Stuart King Mans
1:58.88 Robbie Schofield Ribb
1:58.9 Lee Reynolds Herts P
1:59.03 Tom Grimley Cov
1:59.07 Tom Love Ips
1:59.14 Chris Discombe Les C
1:59.20 Daniel Poulton SNH
1:59.20 Mark Oldham Stend
1:59.23 Paul Harmer Charn
1:59.30 Robert Ridley Newb
1:59.44 Steve Evison Sheff
1:59.44 Mark Gardner L&M
1:59.52 Steven Morrow B&A
1:59.57 Ryan Grant W'moss
1:59.58 Lee Taylor E&H
1:59.60 David Guest B'end
1:59.62 Dan Lester Cwmb
1:59.73 Daniel Eckersley Burnley
1:59.88 Russell Best New M



Birmingham, 3.3.07. HELEN CLITHEROE. photo by Mark Shearman.

1:55.41 Andrew Owen Chelm
1:55.56 Andrew de-Camps FoD
1:55.56 Chris Johnson Craw
1:55.68 Sam Evans C&S
1:55.70 Kurt Heron Morp
1:55.86 Anthony Wilson S Dev
1:55.96 Gareth Wiltshire Bath
1:55.96 Aidan Reid Mans
1:55.96 Andy Teate M'bro
1:56.11 Martyn Gibbons Notts

1:57.29 Carl Shubotham Stoke
1:57.3 Gary Smith Falk
1:57.41 David Boyce B&H
1:57.53 Robert Holbrow B&W
1:57.6 Martin Airey B&B
1:57.85 Charlie Eastaugh Learn
1:57.88 Rich Airey B&H
1:58.1 Carl Goose Norw
1:58.43 Chris Smith Wirr
1:58.53 Shaun Devenney CoE

1500

3:43.72 Chris Warburton Notts
3:44.15 James Thie Card
3:46.95 Andy Baddeley Harrow
3:49.8 James Williams Card
3:49.9 Sean Dirrane Leeds C
3:50.44 Gavin Keight Hallam
3:50.6 Lee Emanuel Sheff
3:51.45 Michael Coltherd Traff
3:52.2 Kevin Kane C'nauld
3:52.26 Colin McCourt B'mth
3:52.76 Shaun Moralee Dur
3:53.1 Drew Graham Gosf
3:53.35 Richard Weir Der
3:53.70 Jamie Atkinson B&B

3:54.10 Ben Tickner Wells
 3:54.22 Chris Mulvaney Bolt
 3:55.09 Tom Penfold Bir
 3:55.31 Gareth Hill B&A
 3:55.72 Mark Sanford Bas
 3:55.73 Bruce Raeside Notts
 3:56.09 Tom Carter Vale R
 3:56.28 Owain Matthews Bed C
 3:57.03 Chris Watson Belg
 3:57.37 Sam Walsh Swan
 3:57.86 Ben Green Warr
 3:58.00 Michael Johnson Card

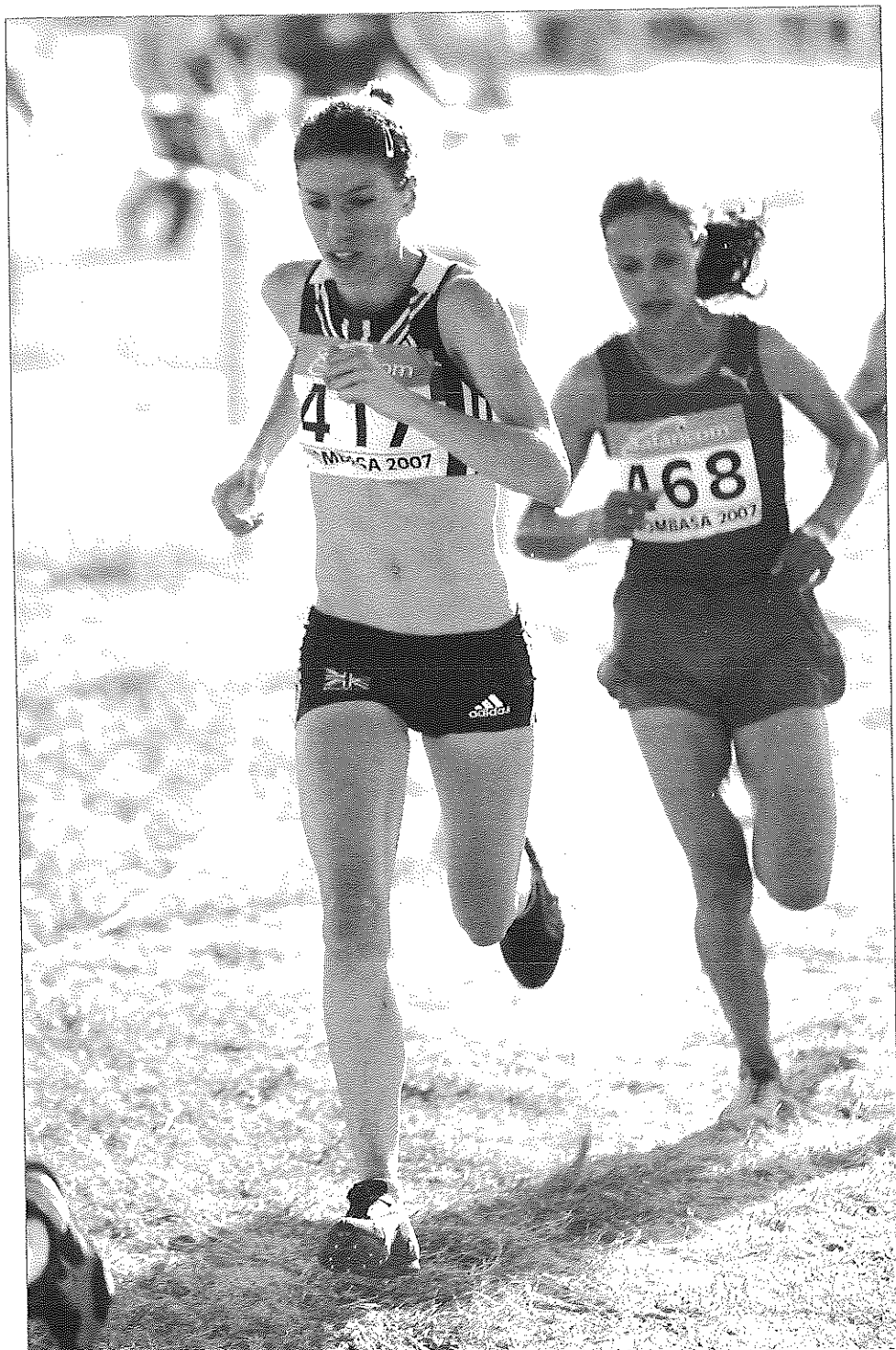
3:58.2 Tom Marley B&W
 3:58.32 Anthony Wilson S Dev
 3:58.54 Matt Warley Chelt
 3:58.66 Matt Wood B'burn
 3:58.78 Martin Reid Sheff
 3:59.8 Harry Jones Col B
 3:59.85 Daniel Beier Norw
 4:00.77 Craig Houston CoE
 4:00.77 Karl McCulloch AFD
 4:01.09 Paul Hutton Gosf
 4:01.1 Nathan Bibby Prest
 4:02.09 Colin Miles Send

4:02.11 Douglas Selman Cors
 4:02.25 Ben Harding Ports
 4:02.49 Henry Hammond Cov
 4:02.55 Andy Whetstone Mil K
 4:02.72 Mike Tallis IIF
 4:03.05 Nick Samuels Sale
 4:03.06 Matthew Addison B&R
 4:03.28 Ian Rawlinson Bord
 4:03.29 James Mills Wrex
 4:03.29 Daniel Gurmin Swan
 4:03.56 Andrew Welch Ashf
 4:03.59 Rob Banjac Roch

4:03.81 Richard Ward Belg
 4:03.84 Paul McCloskey Pit
 4:04.12 Andrew de-Camps FoD
 4:04.22 Alexander Smith Hallam
 4:04.33 Simon Rusbridge Exe
 4:04.65 Jonathon Cook Camb U
 4:04.70 Simon Lawson Card
 4:04.7 Mark Ryall VP&TH
 4:04.83 Ben Scarlett Swin
 4:04.88 Michael Dyer N Down
 4:05.19 Chris Mulroy Corn
 4:05.40 Scott Fraser Loth
 4:05.64 Chris O'Hare CoE
 4:05.78 Nathan Riding Ribb
 4:05.94 Matthew Turner Shett
 4:06.1 Johnathan Morgan Newp
 4:06.42 Stephen Matthews Cambus
 4:06.7 Dewi Griffiths Carm
 4:06.75 Steve Neill Tel
 4:07.07 Scott Harris E'rne
 4:07.28 Stewart Campbell Arb
 4:07.64 Ben Styles Stock H
 4:07.77 Ashley Sabin Charn
 4:07.78 Allan Ramsay Kirk O
 4:07.85 Peter Barker St Ed

3000

7:50.86 Mohamed Farah NEB
 7:56.01 Tom Lancashire Bolt
 7:57.76 Luke Gunn Der
 8:00.09 Andrew Lemoncello Fife
 8:01.35 Nick McCormick Morp
 8:04.84 Lee Merrien Cl
 8:05.50 Adam Bowden Harrow
 8:06.88 Scott Overall B&B
 8:08.43 Phil Nicholls Tip
 8:09.69 Daniel Watts P'boro
 8:12.29 Mark Draper WSEH
 8:13.24 Steve Sharp Belg
 8:15.14 Ross Toole Kilb
 8:15.99 Mark Buckingham Holm
 8:16.10 Glen Comish Sale
 8:16.83 Sean Dirrane Leeds C
 8:17.48 Chris Parr Gate
 8:18.79 Jonathan Blackledge Belg
 8:19.31 Ryan McLeod Els
 8:22.13 Rob Mullett Lewes
 8:22.82 Andrew Toward Morp



Mombasa, 24.3.07. HATTIE DEAN (417). photo by Mark Shearman.

8:25.76 Iain Whitfield Chelt
 8:28.12 Darren Gauson CoE
 8:28.25 James Williams Card
 8:28.43 Michael Johnson Card
 8:29.77 James Thie Card
 8:33.03 Alex Felce Chelt
 8:33.29 James Kelly Camb U
 8:34.57 Matt Barnes-Smith Ips
 8:34.95 Ben Warren Hail
 8:35.24 Simon Lawson Card
 8:35.25 Tom Marley B&W
 8:35.93 Matthew Addison B&R
 8:37.0 Richard Ward Belg
 8:38.62 Scott Sterling NEB
 8:38.78 Anthony Wilson S Dev
 8:41.30 Simon Taylor Abbey
 8:41.70 David Notman Swan
 8:42.63 Scott Fraser Loth
 8:43.12 James Shane Bas
 8:43.3 Andrew Pickett Dartf
 8:44.3 Guy Amos Norw
 8:45.88 Paul Green Hallam
 8:46.60 Ian Grime NEB
 8:46.6 Ben Paviour Herne H
 8:46.91 Andy Whetstone Mil K
 8:47.49 Andrew Young B&W
 8:47.9 Mark Ryall VP&TH
 8:48.25 Afan Humphries Cwmb
 8:49.65 Steve Worthington L&M
 8:50.19 Stephen Lisgo Mans
 8:50.9 Paul Rockliffe Traff
 8:51.75 Rob Berry S'port W
 8:52.0 Matthew Bond Sale
 8:52.47 Peter Barker St Ed
 8:52.7 Matthew Carey Harrow
 8:55.78 Paul McCloskey Pit
 8:55.96 Mick Jagger Linc W
 8:56.25 Max Colligan B'burn
 8:56.30 Peter Grist Poole R
 8:56.36 Murray Strain Edin U
 8:56.97 Robert Malseed Col H
 8:59.54 Stewart Campbell Arb

U20 Men

800

1:48.75 James Brewer Chelt
 1:51.12 Andrew Osagie Harl
 1:51.23 Daniel Stepney Phoe

1:51.94 Joe Thomas Card
 1:52.88 Ed Aston C&C
 1:52.97 Nicky Moore Kilb
 1:53.3 Matthew Turner Shett
 1:53.81 Ieuan Thomas Cwmb
 1:54.27 Paul Bradshaw B'burn
 1:54.40 Andrew Gibson Kilb
 1:54.71 Michael Cole N Dev
 1:54.8 Rick Ward Norw
 1:55.28 Anthony Gray Birm R
 1:55.56 Chris Johnson Craw
 1:55.68 Sam Evans C&S
 1:55.96 Aidan Reid Mans
 1:57.1 Mark Woodley Chelm
 1:58.43 Chris Smith Wirr
 1:58.55 Anthony Bird SSH
 1:58.66 Dan Bartlett Bath
 1:58.69 Liam McCully Liv H
 1:58.85 Stuart King Mans
 1:59.03 Tom Grimley Cov
 1:59.07 Tom Love Ips
 1:59.30 Robert Ridley Newb
 1:59.62 Dan Lester Cwmb
 2:00.1 Jamie Fenaroli Swan
 2:00.4 Atak Diing High

2:00.6 Josh Fairclough Ashf
 2:00.72 Ben Sharman Kett
 2:00.77 Alistair Smith Cov
 2:00.92 Nathan Riding Ribb
 2:00.93 Jason Black Vic P
 2:01.41 Rhys Smith Hal
 2:01.48 Dan Potts C&C
 2:01.5 Graeme Gibson Dunf
 2:01.83 Steven Fox Seat
 2:01.88 James Griffiths Vale R

1500

3:59.8 Harry Jones Col B
 4:01.1 Nathan Bibby Prest
 4:02.11 Douglas Selman Cors
 4:02.72 Mike Tallis IIF
 4:04.70 Simon Lawson Card
 4:05.78 Nathan Riding Ribb
 4:05.94 Matthew Turner Shett
 4:07.78 Allan Ramsay Kirk O
 4:08.97 Kenny Boyd Glas Sc Sp
 4:09.04 Jacob Harman Holm
 4:10.2 Andrew Gibson Niths
 4:10.38 Peter Matthews B'burn
 4:11.11 Christopher Price Wake

4:11.80 Calum McKenzie Cors
 4:12.01 Jamie Fenaroli Swan

3000

8:35.24 Simon Lawson Card
 8:43.12 James Shane Bas
 9:02.35 Ricky Challinor Dees
 9:05.37 Nathan Hardee Newp
 9:08.93 Christopher Price Wake
 9:10.67 Kris Lecher Hull A
 9:13.7 Paul Whittaker S'end

U17 Men

800

1:57.85 Charlie Eastaugh Leam
 1:58.53 Shaun Devenney CoE
 1:58.73 Davey Platt N Dev
 1:58.88 Robbie Schofield Ribb
 1:59.57 Ryan Grant W'moss
 1:59.60 David Guest B'end
 1:59.88 Russell Best New M
 2:00.50 Nicholas Johnson Newp
 2:00.54 Thomas Atkinson Wake
 2:01.31 Joe Basquill Ribb
 2:01.6 Chris O'Hare CoE



Sheffield, 11.2.07. MARILYN OKORO wins the 800m. from JENNIFER MEADOWS. photo by Mark Shearman.

2:01.68 Charles Gunning SB
 2:02.01 Gawain Rogers Wrex
 2:02.05 Toby Griffiths Osw
 2:02.45 Joshua Moody Mat
 2:02.65 Johnathan Morgan Newp
 2:02.71 Gregor Innes Vic P
 2:02.73 Niall Flannery Gate
 2:02.82 Matthew Lloyd Prest
 2:03.1 Omar Mansour WG&EL
 2:03.5 Jamie Smith CoE
 2:03.55 Oliver Cartwright Bord
 2:04.13 James Benjamin VoA
 2:04.2 Jamie Crawford Strab
 2:04.47 Ian Yates Ribb
 2:04.48 Louis Walshe Herts P

4:08.9 Rhys Glastonbury Rad
 4:09.52 Noel Collins Omagh
 4:11.2 Matthew Graham Kirk O
 4:11.6 Nicholas Johnson Newp
 4:12.4 Jamie Smith CoE
 4:12.86 Tom Bowerman AFD
 4:13.28 Andrew Ridley W Suff
 4:13.68 Joshua Moody Mat
 4:14.14 Robbie Schofield Ribb
 4:14.64 Chris Carter Tel
 4:14.8 Jamie Bussell Cwmb
 4:15.14 Daryl Connolly Liv H
 4:19.6 Geraint Mansfield Carm
 4:19.92 Matthew Jackson Warr

2:07.51 Paul Scanlan WG&EL
 2:07.69 Darren Weir Falk
 2:08.31 Craig Prior Dumb
 2:08.56 Peter Devaney Bed C
 2:10.2 Adam Ingram Lag V
 2:11.17 Craig Robinson Pit
 2:12.90 Ryan Gilhooly Lass

2:24.70 Thomas Earley Col B
 2:25.1 Neil Gourley Giff N
 2:26.36 Rory Muir Dunf

1500

4:50.8 Thomas Earley Col B
 4:56.4 Daniel Lewis Neath
 5:01.21 Neil Gourley Giff N

1500

4:25.9 Elliot Hardee Newp
 4:26.2 Daniel Chesworth Newp

3000

9:44.07 Chris Carpanini Newp
 9:59.15 Stuart Tucker Erme

Overall Women

800

1:59.87 Marilyn Okoro SB
 1:59.88 Jennifer Meadows Wig D
 2:03.53 Karen Harewood Corby
 2:04.15 Celia Brown R&N
 2:04.43 Joanna Ross Vic P
 2:04.74 Liz Brathwaite Herts P
 2:04.85 Katrina Wootton Bed C
 2:05.32 Charlotte Best Craw
 2:05.7 Catherine Riley Traff
 2:06.89 Victoria Griffiths Liv H
 2:07.10 Rachael Thompson Alt
 2:07.15 Claire Gibson Kilb
 2:07.46 Claire Nichols Woking
 2:08.07 Michaela Hutchison Hill
 2:08.89 Suzanne Hasler
 2:09.30 Kathryn Evans Elgin
 2:09.65 Barbara Parker Norw
 2:10.02 Jenny Mockler Sale
 2:10.74 Anouska McConnell Bir
 2:10.89 Rachel Stringer Norw
 2:11.14 Ellie Darby Bir
 2:11.4 Claire Robinson BMH
 2:11.96 Nisha Desai Morp
 2:12.09 Roseline Agboke (was Addo) Newb
 2:12.30 Charlotte Browning AFD
 2:12.54 Kelly Sotherton Bir
 2:12.74 Laura Siddall Sale
 2:13.18 Frederica Foster S Lon
 2:13.29 Kelly Johnson Wake
 2:13.57 Kerry Harty Newc
 2:13.71 Beth Duff E Kilb
 2:13.89 Natalie Shaw Staffs U
 2:14.03 Lynsey Sharp ESH
 2:14.03 Hollie Young Glas
 2:14.11 Sigourney Bell Gate
 2:14.36 Emily Goodall Craw



Birmingham, 3.3.07. JAMES BREWER leads the 800m. semi-final. photo by Mark Shearman.

2:04.83 Grant Tilley Mil K
 2:05.00 Craig McDowall Living

1500
 4:05.64 Chris O'Hare CoE
 4:06.1 Johnathan Morgan Newp
 4:06.7 Dewi Griffiths Carm

3000
 9:02.36 Abdirisak Ahmed Sheff
 9:18.88 Jamie Bussell Cwmb
 9:22.99 Iain Lynn York

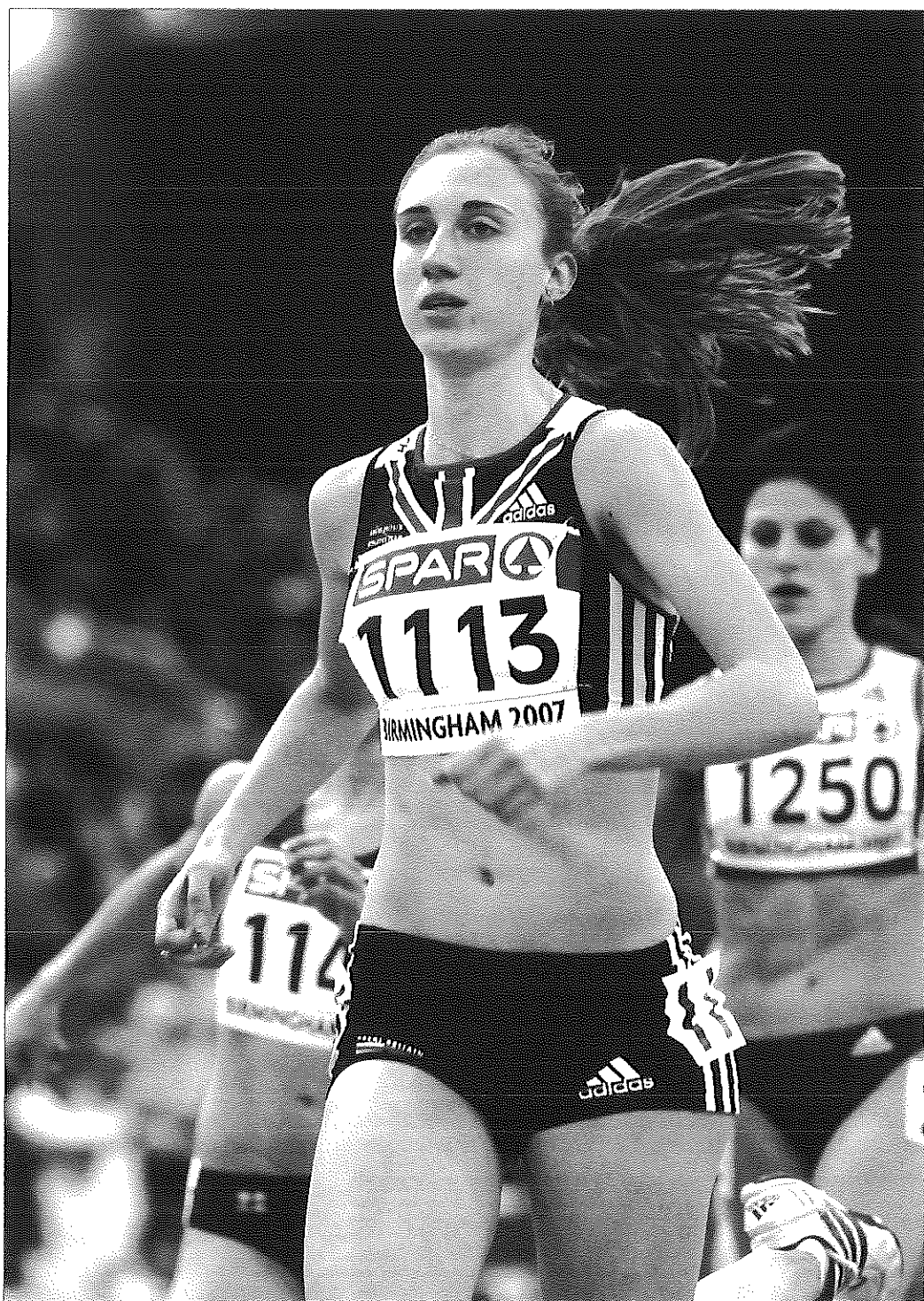
U15 Men
800

U13 Men

800

2:22.04 Scott Edwards Der
 2:22.88 Ross Hill Law
 2:23.46 Morgan Thomas B'end
 2:24.19 Max Aitchison, Vic P

2:14.5 Katie Parkes Carm	2:18.72 Ashleigh Williams Ribb	2:19.74 Gemma Weetman Osw	2:20.75 Siobhan Harrison Mans
2:14.74 Helen Singleton Wake	2:18.76 Katia Lannon Sale	2:19.88 Emma McIntyre Sale	2:20.9 India Lee Win
2:14.96 Rosy Cooper AFD	2:18.79 Laura Brown Dund H	2:20.1 Katherine Deal SB	2:20.95 Sarah Heath SB
2:15.13 Leigh Lennon Ribb	2:18.86 Rebecca Finch Glas	2:20.18 Tracey Hinton Card	2:21.08 Samantha Sajkovic KuH
2:15.14 Ejiro Okoro Bir	2:18.86 Sarah Shuttleworth Sale	2:20.25 Jenny Tan Fife	2:21.1 Lauren Peffers Dunb
2:15.30 Sarah Hood ESH	2:18.95 Victoria Connor Kirk O	2:20.26 Nicki Gooderham Norw	2:21.1 Kimberley Goodall Cl
2:15.3 Alex Turner Amber	2:19.1 Gemma Marrs S Lon	2:20.34 Tyra Watson Sale	2:21.39 Rebecca Nuttall Dees
2:15.38 Sarah Bell Harrow	2:19.27 Amanda Campbell Living	2:20.37 Jo Harper C&S	2:21.7 Beth Potter Glas
2:15.42 Victoria Barcello Card	2:19.4 Kathrine Foy WG&EL	2:20.5 Mhairi Inglis Loth	2:21.89 Emily Brown Card
2:15.72 Sally Read-Cayton Woking	2:19.47 Jemma Scott Pit	2:20.57 Rochelle Harrison Louth	2:21.92 Niki Wastenev Norw
2:15.80 Kate Wiltshire Card	2:19.67 Ellie Buchan A'deen	2:20.62 Caryl Granville Carm	2:21.95 Billie Attard Card
2:15.8 Chrissie Foster TVH	2:19.74 Eilish McColgan Dund H	2:20.65 Christie Childs Mans	2:22.00 Leanne Fitzgerald Card
2:15.85 Sara Dobler Swan			
2:15.88 Rowena Cole Cov			
2:15.96 Liz Wild Macc			
2:16.04 Calli Thackery Hallam			
2:16.13 Claire Duck York			
2:16.21 Niki Tribe WSEH			
2:16.42 Georgia Milton Mans			
2:16.58 Lyndsey Freel Drom			
2:16.59 Bella Clayton B&B			
2:16.99 Denise Morley Col H			
2:17.03 Jessica Ennis Sheff			
2:17.21 Jessica Dickson Cwmb			
2:17.43 Sarah Simmons Holm			
2:17.49 Rhiannon Linnington-Payne Brnth			
2:17.49 Laura Kirk Sky			
2:17.6 Sophie Wilkins Mil K			
2:17.6 Bernadine Pritchett WG&EL			
2:17.67 Ashleigh Kennedy Lass			
2:17.70 Gemma Jones Llis			
2:17.7 Elaine Murty Dartf			
2:17.7 Emma McShane E Down			
2:17.74 Kitty Walsh F'bank			
2:17.75 Abbie Vernon Roth			
2:17.90 Jade Williams Rad			
2:18.08 Benytta Dornan Cwmb			
2:18.09 Abbey McGhee Vic P			
2:18.10 Erin Mcilveen C'nauld			
2:18.1 Eimear Black B&A			
2:18.16 Lyndsey Fitzgerald Newp			
2:18.20 Tara Bird WG&EL			
2:18.35 Sarah Inglis Loth			
2:18.38 Ruth Mitchell B&W			
2:18.48 Meghan Beesley Tam			
2:18.50 Megan McLeish Falk			
2:18.5 Sasha Hooks NBH			
2:18.69 Lyndsey Monteith Lisb			



Birmingham, 4.3.07. LISA DOBRISKEY. photo by Mark Shearman.

2:22.09 Caitlin Hendry Cambus	4:32.73 Carol Glover B'burn	4:54.99 Nicki Gooderham Norw	10:13.99 Bernadine Pritchett WG&EL
2:22.40 Catriona Lockie Giff N	4:33.28 Emma Reed B&W	4:55.1 Natasha Cockram Cwmb	10:20.00 Katherine Humphreys Exe
2:22.65 Danielle McCann Prest	4:33.33 Kate Buchan M&M	4:55.46 Eilish McColgan Dund H	10:20.2 Rosanna Iannone VoA
2:22.77 Adele Tracey G&G	4:34.1 Beth Potter Glas	4:55.57 Abbie Vernon Roth	10:23.40 Susan Finch Glas
2:22.78 Rhian Dawes Glas	4:35.09 Wendy Davis Lag V	4:55.88 April Stevenson Horw	10:24.80 Emma Clayton Scun
2:22.94 Anna Newton Win	4:35.46 Michaela Hutchison Hill	4:55.9 Nicola Lindsay Law	10:25.61 Emily Ferenczi SB
2:23.10 Kathryn Davies Newp	4:35.6 Deborah Niccol B&W	4:56.0 Aysha Doman Cwmb	10:26.54 Vicky Graves York
2:23.14 Georgia Bell ESM	4:35.67 Claire Tarplee SSH	4:56.27 Polly Keen Havant	10:32.6 Julia Leventon Traff
2:23.16 Lucy Yates SB	4:36.9 Emma Whittaker B&W	4:56.40 Charlie Gaspar Mil K	10:33.4 Susan Ridley ESH
2:23.26 Leanne Buxton Bed C	4:36.92 Ruth Senior Norw	4:56.5 Sarah Heath SB	10:36.79 Sarah Beevers Wake
2:23.26 Katie Sandford WxB	4:36.94 Nicola Squires Hallam	4:57.2 Benytta Doman Cwmb	10:36.90 Christine Bertram Belg
2:23.37 Eleanor Duncan Forres	4:37.6 Josephine Moultrie Glas	4:57.30 Mhairi Inglis Loth	10:37.00 Rebecca Harrison Stoke
2:23.40 Nicola Youden Gate	4:39.4 Katherine Humphreys Exe	4:58.37 Holly Robinson B'burn	10:40.50 Polly Keen Havant
2:23.4 Lizzie Adams Hallam	4:39.77 Rosy Cooper AFD	4:59.88 Rhian Dawes Glas	10:43.31 Jacqui Thomson Glas
2:23.54 Cerys Morgan Swan	4:39.94 Bernadine Pritchett WG&EL	4:59.9 Cerys Morgan Swan	10:44.14 Bethan Davies B&W
2:23.55 Carly Brown Norw	4:40.28 Sarah Inglis Loth		10:46.06 Siobhan Coleman Pit
2:23.60 Catriona Sinclair ESH	4:40.99 Helen Singleton Wake	3000	10:46.91 Lois Rosindale Leeds & Br
2:23.6 Hannah Goodwin Bed C	4:41.28 Kaye Kirkham Sale	8:31.50 Jo Pavey Exe	10:59.26 Alaw Beynon-Thomas Carm
2:23.78 Amy Hill Sheff	4:41.8 Bethan Strange Card	8:47.25 Lisa Dobriskey Ashf	10:59.67 Susie Tawney Leam
2:23.86 Nadine Terry Dartf	4:43.56 India Lee Win	8:58.27 Helen Clitheroe Prest	
2:23.9 Emma Willits York	4:43.85 Kerry Harly Newc	9:14.1 Jo Ankier SB	U20 women
2:24.16 Beth Daniel Swin	4:44.09 Emily Stewart Dund H	9:23.17 Emily Pidgeon Glouc	800
2:24.3 Katie Silva Cl	4:44.29 Phillippa Aukett Worth	9:24.49 Aine Hoban Wake	2:10.89 Rachel Stringer Norw
2:24.31 Sinead Kelly Unatt	4:45.17 Elinor Kirk Swan	9:28.05 Faye Fullerton Hav M	2:14.03 Lynsey Sharp ESH
2:24.4 Nicola Lindsay Law	4:45.71 Natalie Grant Roth	9:28.40 Jessica Sparke WG&EL	2:14.36 Emily Goodall Craw
2:24.4 Claire McAuley Giff N	4:45.8 Jade Williams Rad	9:32.46 Susie Hignett B'mth	2:14.5 Katie Parkes Carm
2:24.5 Rachel Gibson Lisb	4:45.97 Emily Goodall Craw	9:33.20 Catherine Dugdale Swan	2:14.96 Rosy Cooper AFD
2:24.69 Hannah Francis-Smithson Leeds C	4:46.33 Katie Parkes Carm	9:34.65 Charlotte Purdue AFD	2:15.14 Ejiro Okoro Bir
2:24.9 Isabella King Lewes	4:47.27 Emily Brown Card	9:35.43 Olivia Kenney RSC	2:15.80 Kate Wiltshire Card
2:24.94 Rheannon Rainford Warr	4:47.85 Claire McAuley Giff N	9:38.45 Sarah Bouchard Stock H	2:15.85 Sara Dobler Swan
2:24.99 Lora Roberts B'end	4:48.10 Elaine Murty Dartf	9:38.75 Sarah Hopkinson Glouc	2:17.21 Jessica Dickson Cwmb
	4:48.2 Leanne Fitzgerald Card	9:42.47 Abigail Wilshire B&W	2:17.67 Ashleigh Kennedy Lass
1500	4:48.27 Suzi Boast Bed C	9:43.73 Susie Bush Newb	2:18.09 Abbey McGhee Vic P
4:05.81 Helen Clitheroe Prest	4:48.38 Leigh Lennon Ribb	9:43.84 Sarah Maude Charn	2:18.38 Ruth Mitchell B&W
4:17.01 Lisa Dobriskey Ashf	4:48.8 Emma Clayton Scun	9:48.99 Rachel Gibbs Bed C	2:18.48 Meghan Beesley Tam
4:17.70 Hannah England Oxf C	4:49.2 Ruth Mitchell B&W	9:52.47 Harriet Scott Hav M	2:18.72 Ashleigh Williams Ribb
4:17.90 Katrina Wootton Bed C	4:49.45 Charlotte Arter Bord	9:57.15 Genni Gardner G&G	2:18.86 Rebecca Finch Glas
4:20.37 Joanna Ross Vic P	4:50.76 Rebecca Finch Glas	9:58.18 Claire Robson Tees	2:20.62 Caryl Granville Carm
4:21.00 Ellie Stevens Der	4:50.83 Nisha Desai Morp	9:58.35 Stacey Ward Bas	2:20.9 India Lee Win
4:21.55 Emma Pallant AFD	4:50.99 Laura Nurse N Dev	10:00.24 Emma Waterhouse Centr	2:21.1 Lauren Peffers Dunb
4:21.87 Charlotte Best Craw	4:51.45 Katie Clark Hull A	10:00.33 Maria Barrett Liv PS	2:21.39 Rebecca Nuttall Dees
4:22.03 Celia Brown R&N	4:51.5 Leah Dixon Neath	10:00.49 Amanda Crook S'port W	2:22.94 Anna Newton Win
4:22.08 Tina Brown Cov	4:51.94 Pippa Cullingham Brun U	10:01.51 Emma Whittaker B&W	2:23.10 Kathryn Davies Newp
4:23.28 Jessica Sparke WG&EL	4:52.18 Lauren Peffers Dunb	10:02.55 Ruth Senior Norw	2:23.16 Lucy Yates SB
4:27.90 Sarah Hopkinson Glouc	4:52.33 Ella Fisher B&B	10:05.20 Emily Brown Card	2:23.4 Lizzie Adams Hallam
4:28.21 Hayley Beard SNH	4:52.81 Lucy Yates SB	10:05.81 Nicola Squires Hallam	2:23.60 Catriona Sinclair ESH
4:30.37 Linzi Snow WG&EL	4:52.85 Amanda Crook S'port W	10:09.5 Jane Clarke Norf G	2:23.78 Amy Hill Sheff
4:31.46 Rachael Thompson Alt	4:53.19 Ellen Butler Notts	10:10.9 Catherine Bryson Belg	2:23.9 Emma Willits York

2:24.31 Sinead Kelly Unatt
2:24.69 Hannah Francis-Smithson Leeds C
2:24.94 Rheannon Rainford Warr

1500

4:21.55 Emma Pallant AFD
4:33.28 Emma Reed B&W
4:35.67 Claire Tarplee SSH
4:39.77 Rosy Cooper AFD
4:43.56 India Lee Win
4:45.17 Elinor Kirk Swan
4:45.71 Natalie Grant Roth
4:45.97 Emily Goodall Craw
4:46.33 Katie Parkes Carm
4:48.27 Suzi Boast Bed C
4:48.8 Emma Clayton Scun
4:49.2 Ruth Mitchell B&W
4:50.76 Rebecca Finch Glas
4:52.18 Lauren Peffers Dunb
4:52.81 Lucy Yates SB
4:56.0 Aysha Doman Cwmb
4:56.27 Polly Keen Havant

3000

9:23.17 Emily Pidgeon Glouc
9:35.43 Olivia Kenney RSC
10:24.80 Emma Clayton Scun
10:26.54 Vicky Graves York
10:40.50 Polly Keen Havant
10:44.14 Bethan Davies B&W
10:46.06 Siobhan Coleman Pit
10:46.91 Lois Rosindale Leeds & Br
10:59.26 Alaw Beynon-Thomas Carm

U17 Women

800

2:13.71 Beth Duff E Kilb
2:15.13 Leigh Lennon Ribb
2:15.3 Alex Turner Amber
2:15.88 Rowena Cole Cov
2:16.42 Georgia Milton Mans
2:17.43 Sarah Simmons Holm
2:17.49 Rhiannon Linnington-Payne B'nth
2:17.6 Sophie Wilkins Mil K
2:17.7 Emma McShane E Down
2:17.74 Kitty Walsh F'bank
2:17.75 Abbie Vernon Roth
2:18.08 Benytta Doman Cwmb

2:18.1 Eimear Black B&A
2:18.35 Sarah Inglis Loth
2:18.50 Megan McLeish Falk
2:18.5 Sasha Hooks NBH
2:19.27 Amanda Campbell Living
2:19.4 Kathrine Foy WG&EL
2:19.74 Eilish McColgan Dund H
2:20.1 Katherine Deal SB
2:20.25 Jenny Tan Fife
2:20.5 Mhairi Inglis Loth
2:20.57 Rochelle Harrison Louth
2:21.7 Beth Potter Glas
2:21.95 Billie Attard Card
2:22.00 Leanne Fitzgerald Card
2:22.09 Caitlin Hendry Cambus
2:22.40 Catriona Lockie Giff N
2:22.78 Rhian Dawes Glas
2:23.26 Katie Sandford WxB
2:23.37 Eleanor Duncan Forres
2:23.55 Carly Brown Norw
2:23.6 Hannah Goodwin Bed C
2:23.86 Nadine Terry Dartf
2:24.4 Claire McAuley Giff N
2:24.5 Rachel Gibson Lisb

1500

4:27.90 Sarah Hopkinson Glouc
4:34.1 Beth Potter Glas
4:37.6 Josephine Moultrie Glas
4:40.28 Sarah Inglis Loth
4:44.09 Emily Stewart Dund H
4:47.85 Claire McAuley Giff N
4:48.2 Leanne Fitzgerald Card
4:48.38 Leigh Lennon Ribb
4:49.45 Charlotte Arter Bord
4:51.45 Katie Clark Huli A
4:51.5 Leah Dixon Neath
4:55.46 Eilish McColgan Dund H
4:55.57 Abbie Vernon Roth
4:55.88 April Stevenson Horw
4:57.2 Benytta Doman Cwmb
4:57.30 Mhairi Inglis Loth
4:58.37 Holly Robinson B'burn
4:59.88 Rhian Dawes Glas
5:02.2 Jenny MacDougall CoE
5:03.59 Katie Trehwella WSEH
5:03.64 Nicole McLeod Giff N
5:03.9 Becky Dunphy C'stie

3000

9:34.65 Charlotte Purdue AFD
9:38.75 Sarah Hopkinson Glouc

U15 Women

800

2:13.18 Frederica Foster S Lon
2:14.03 Hollie Young Glas
2:14.11 Sigourney Bell Gate
2:16.04 Calli Thackery Hallam
2:17.90 Jade Williams Rad
2:18.95 Victoria Connor Kirk O
2:19.67 Ellie Buchan A'deen
2:20.34 Tyra Watson Sale
2:20.65 Christie Childs Mans
2:20.75 Siobhan Harrison Mans
2:21.08 Samantha Sajkovic KuH
2:22.77 Adele Tracey G&G
2:23.14 Georgia Bell ESM
2:23.54 Cerys Morgan Swan
2:24.4 Nicola Lindsay Law
2:24.9 Isabella King Lewes
2:25.01 Natasha Cockram Cwmb
2:25.07 Kathryn Pannel Pit
2:25.21 Chloe Bradley Ret
2:25.46 Deborah Hannah Kirk O
2:25.5 Juliette Knights Norw
2:26.41 Samantha Blair CoE
2:26.50 Chelsea McKenzie Bigg
2:26.86 Laura Burke WSEH
2:27.12 Cleo Lewis Lut
2:27.5 Jade Barclay W Dunb
2:27.58 Emily Owens ESH

1500

4:45.8 Jade Williams Rad
4:55.1 Natasha Cockram Cwmb
4:55.9 Nicola Lindsay Law
4:59.9 Cerys Morgan Swan
5:03.8 Deborah Hannah Kirk O
5:06.23 Kathryn Pannel Pit

U13 Women

800

2:24.99 Lora Roberts B'end
2:26.23 Hywelis Thomas-Howells Neath
2:29.60 Lauren Bell P'broke

2:30.66 Kate Murdoch A'deen
2:31.60 Petrena Marshall Giff N
2:37.3 Nikki Manson Giff N
2:37.35 Katie Reid Pit
2:38.44 Blair Wood Living
2:39.83 Olivia O'Hare CoE

1500

5:01.0 Hywelis Thomas-Howells Neath
5:08.9 Lora Roberts B'end

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