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MARK SHEARMAN

Alex Bell –
800m semi-finalist
in Doha 2019.

Cover: Jake Wightman in action over 1500m at the IAAF World Champs - he finished 5th in the final with a new Scottish Record of 3:31.87. © Mark Shearman

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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 are 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.

WELCOME TO THE AUTUMN EDITION OF BMC NEWS 2019.

"A race is a work of art that people can look at in as many ways as their capable of understanding." Steve Prefontaine.

Welcome to the 2019 edition of BMC News. It has been my pleasure to have edited the last three editions and this year has been one to remember.

As an aspiring young runner I marvelled at the achievements of the quartet of Coe, Cram, Ovett and Elliot. Coe's three world records during the summer of 1979 in 41 days came at a time when athletes rivalled footballers in the national psyche.

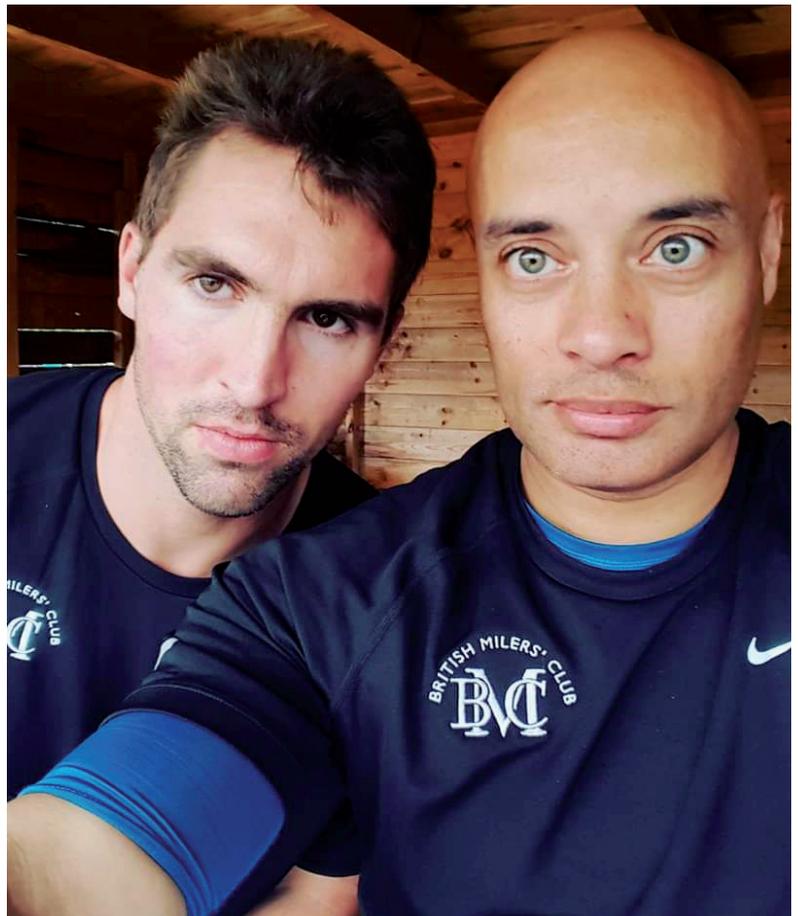
Max Burgin opened up the season in style with 1:46.80 at Loughborough, a week later he set a new European Under 20 mark of 1:45.36 for 800m. It was my pleasure to have Max with Father and Coach Ian reflect on 2019.

Burgin couldn't grace the European Under 20 champs in Borras, due to injury but the mantle was taken by Oliver Dustin who led a British clean sweep (along with Ben Pattison and Finley McClear). Not to be outshone Isabelle Boffey (also interviewed by Matt Long) led a British 1-3 with Keeley Hodgkinson.

For the past few years these young Brits have been inspired by Laura Muir, fifth in the Doha 1500m final (3:55.76). However, after '20 years of hurt' the sight of three Brits in the 1500m final with Wightman, Kerr and Gourley, stirred echoes of the Golden era of the 1980's.

Are we on the cusp of a Golden era in the sport with the likes of Burgin, Boffey and Wightman challenging for the same type of media attention enjoyed by other heroes of our sport such as Diane Asher-Smith?

It is an honour to be involved with and work for a club which is unique to British athletes where we warmly welcome overseas competitors. In a world dominated by social media and other distractions, it is heartening that Generation Z have started to blaze a trail in the sport. Thank you to all of our contributors, and to our superb designer Britta Sendlhofer.



In the Autumn 2018 edition an article entitled '800m Training' was incorrectly attributed to John Skeffington – this was written by Charles McConnell – apologies from the editor.

Chairman's Notes

AUTUMN 2019

Welcome to the Autumn 2019 edition of the BMC News.

Back in July, we were very happy to be able to announce a new sponsorship deal with Saucony. Our thanks go to Gareth Lloyd and the team at Saucony for agreeing the deal and for their appreciation of what the club is doing to further our mission to improve the standard of British Middle-Distance running. It is already proving to be a constructive partnership and it is great to be working with people who really understand and enjoy our sport. We look forward to working together in the coming years.

It has been a good year for our race program Six world championship qualifications and twenty-six U20 qualifications is an excellent return. I believe it is hugely important that there are realistic qualification opportunities for the international championship qualifications in domestic competition. The BMC is

certainly providing this across the middle-distance events. An excellent addition to the race program venues has been Birmingham University. The relays meeting in August produced a BMC Women's steeplechase-record and a World U20 4x800m best for the BMC team. Thanks go to Luke Gunn for putting this meeting on. It is great when people who have competed recently or are still competing come forward to work with the BMC and bring fresh ideas. Fundamentally we want the BMC to be the middle-distance community and our future depends on coaches and ex-runners coming forward to help the club. Many thanks to all the BMC race organisers and volunteers. You can read more about the season elsewhere in the magazine.

We have expectations of athletes who enter our competitions. Top of the list is politeness and courtesy to our volunteers and meeting officials. It is a big challenge to find enough suitably qualified officials to

make sure our meetings are permitted at a high enough level, so that the times are recognised for championship qualification. Anything that makes officials less willing to volunteer for our meetings is bad for the club. We also expect that when you enter a race you have a serious intention of running it! This might seem obvious but one international runner has been a late drop out from 80% of the races he enters, and he is not alone. This denies fellow athletes an opportunity and means race organisers have extra work re-seeding races.

We are always keen to find the best ways to communicate with members. The BMC News is a vital part of that, as ever this edition is packed with useful articles for both coaches and athletes. We have been very active across social media this year on Facebook, Instagram and Twitter as well as having all our Grand Prix meetings streamed online by Vinco. Of course, communication must be two ways and we are always keen to hear your views and ideas. An athlete survey will be coming out soon and it would be great to get as many responses as possible.

All the best

Tim Brennan
BMC Chairman



Tim Brennan and Neville Taylor with Gareth Lloyd of Saucony at the Eltham GP.

DAVID LOWES

Review of BMC season 2019



Emily Hosker-Thornhill wins the 5k at Watford.

The words of Geoff Wightman, respected coach, familiar stadium voice at major international meetings and proud dad of British international 1500m runner Jake, are as good a place as any to start with a reflection on the 2019 BMC season.

"60 meetings – most ever; 637 races; 6,351

participants; 2,691 Pbs (42 per cent); the envy of other nations and event disciplines. Thanks to all officials and BMC committee for your hard work."

With another season over I think the BMC and all the volunteers who make it work are entitled to a self-indulgent pat on

the back because rest assured Wightman's generous appraisal is shared by many within the middle distance family, from runners to coaches and officials.

Club runners, young and old, constitute the majority of those who throng to the meeting that take place from Glasgow to

Exeter, Chester-le-Street to Eltham and many, many tracks in-between.

But established internationals and rising stars were also regulars, in particular in the Grand Prix Series that comprised meetings at SportCity, Loughborough, Watford, Eltham and Trafford.

Indeed, of the 23 distance track runners on duty for Great Britain at the World Championships in Doha 13 used BMC races as part of their preparations with the likes of Aimee Pratt, Jess Judd, Shelayan Oskan-Clarke and Elliot Giles in particular prominent.

Of the rest of the GB team Kyle Langford, Alexandra Bell, Lynsey Sharp, Jake Wightman, Sarah McDonald, Andrew Butchart, Ben Connor, Elizabeth Bird and Rosie Clark all used the BMC circuit before securing their place at the top table on the international circuit.

Interestingly of those, six achieved World Championships qualifying times at a BMC meeting, underlining the quality of the meetings- namely, Sarah McDonald (1:59.91, Tipton); Sarah McDonald (2:00.15, Watford); Jake Wightman (1:45.55, Watford); Charlie Da'Vall Grice (1:45.72, Watford); Elliot Giles (1:45.80, Watford) and Laura Muir (14:52.02, Glasgow).

That McDonald performance was one of the highlights of the summer as it broke the record as the fastest ever BMC Women only 800m - and it came in a regional race at Tipton as she won the D race!

As BMC chairman Tim Brennan commented, it was the third successive year for a sub 2-minutes 800m.

"Until 2017 we had never had a single one!" said Brennan.

In addition, the move to give more prominence to the steeplechase was

rewarded with 13 men running inside nine minutes and six women dipping inside 10 minutes.

"We feel that was a major step forward," added Brennan.

Other records broken this summer also included the amazing 1:46.80 set by the prodigiously talented Max Burgin at the Loughborough GP to break the BMC Member 800m U20 mark and Australian Georgia Winkcup as she clocked 8:37.42 for an All-Comers record in the 3000m steeplechase.

The other significant landmark included a World record at Birmingham University as the BMC Junior 4x800m quartet of Callum Dodds, Yusuf Bizimana, Finley McClear and Josh Lay clipped five seconds off the previous mark dating back to 1995 with a time of 7mins 20.82secs.

Other stats that shine a light on an excellent season include 26 European Championships U20 qualifications – and goodness knows how many English Schools' marks were achieved – while 637 meetings was the most ever staged by the BMC.

But stats alone never reveal the whole picture. While hundreds of runners were able to celebrate PBs those fast times were for many steppingstones onto success when it mattered most in championships.

Take the men's under 20 800m runners, for example. Since the organisation was launched 13 men have run sub 1:48 in BMC races when still under twenty and four of them did it this year. Topping the list was Max Burgin with 1:46.80 with Oliver Dustin only just behind on 1:46.84. Max's time was a member's record only bettered in a BMC race by Ismael Ahmed who went on to win a Silver medal at the Beijing Olympics.

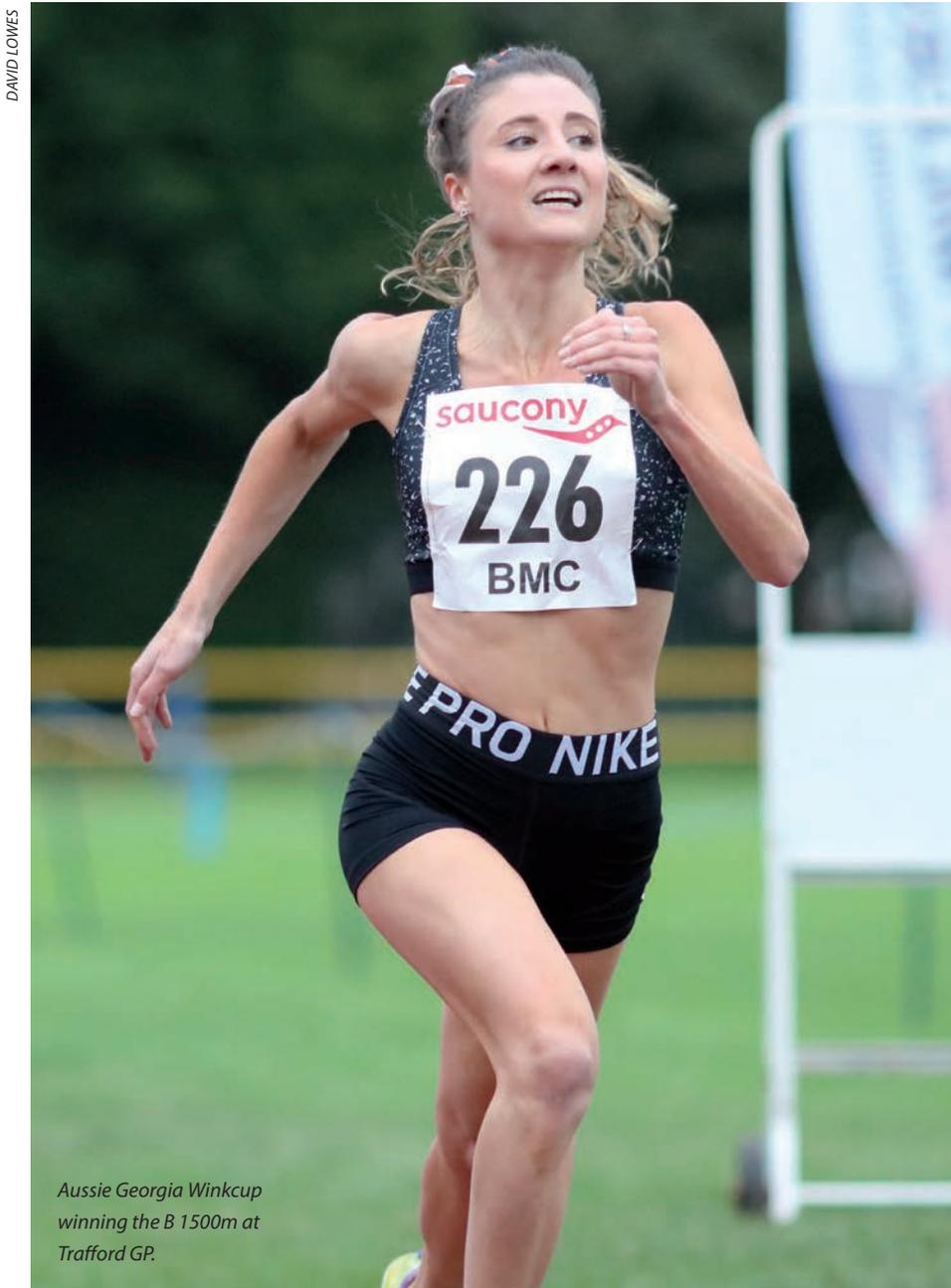
Also under 1:48, which would top the rankings many years, were Alex Botterill and European 1500m medallist Josh Lay.

"What was particularly impressive was that fast times in BMC races were followed up by great championship performances both at the England U20 championships (Max Burgin 1:45.36) and at the European U20 Championships where Oliver Dustin, Ben Pattison and Finley McLearn finished 1, 2 and 3," said Brennan.

"Ben and Finley both went sub 1:49 in BMC races with a total of 10 breaking 1:50."

Elsewhere in this newsletter Dustin explains how the BMC races formed a crucial part of his build-up to that magnificent victory at the European Juniors in Sweden as the Brits swept the board.

So fast times, big performances. The BMC is instrumental in facilitating them all. As I am sure Geoff Wightman would agree, that is a message worth shouting loud and clear.



Aussie Georgia Winkcup winning the B 1500m at Trafford GP.

Kieran Clements en-route to a 5k win at the Trafford GP.





IN PICTURES

DAVID LOWES



Verity Ockenden powers to a metric mile victory at the Trafford GP.



DAVID LOWES

Regular pacer Laure Kiduaka breaks the tape first in the 800m at Trafford. Ben Lee dives for the line to win the Watford GP 800m. Neville Taylor awards the Trafford GP Best of British Prize to Ellie Baker.



DAVID LOWES

DAVID LOWES



Chase competitors clearing the water barrier at the Sport City GP.







Andy Butchart in action over 5000m in Doha, also winner of the 1500m at BMC Watford

MARK SHEARMAN

INDOOR FIXTURE LIST



Date	Time	Location	Event(s)	Meeting Organiser	Online/Entry Fee	Meeting Licence Level
11/12/2019	6-9pm	EIS - Sheffield	800/Mile/3000m (M/W)	Tom Grantham		1
3/1/2020	5-9pm	Emirates Arena - Glasgow	600/3000 (M/W)	Norrie Hay	£10.00	SAL
5/1/2020	1pm	Sheffield	800/1500 (M/W) 3000 (Men Only)	Steve Green	£5.00 (Members) £10.00 (Non Members)	2
22/1/2020	6-9pm	Sheffield	800/1500/3000 (M/W)	Tom Grantham		1
29/1/2020		Lee Valley	800 (M/W)	Matthew Fraser-Moat		2
5/2/2020	6-9pm	Sheffield	800/1500/3000 (M/W)	Tom Grantham		1
19/2/2020		Lee Valley	800 (M/W)	Matthew Fraser-Moat		2

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HARRY SHAKESHAF

Ossama Meslek pulls clear of the metric mile field at the Trafford GP.

Eilish McColgan

Stephen Green enjoys an end of season audience with the new Scottish 5000m Record Holder



MARK SHEARMAN

Eilish makes her 10,000m debut at Highgate in 2019.

SG: You acquitted yourself superbly in the 5000m final in Doha, finishing tenth and running 14.46.17 – what are your reflections on the performance?

EMC: I was satisfied with it overall though myself and Mum did have a target of 14:40 so in that respect we missed the target. The race was basically in two acts and when the Ethiopian runner started slowing to 70/71's we basically missed the break. It was great to get the record but I know from the sessions we have done that I was in sub 14.40 shape, and I had an eye on Jo Pavey's mark of 14:39.96, so although we didn't achieve our targets I have to be happy with the result.

SG: How would you view the 2019 season as a whole?

EMC: I've gone from being 14.55 athlete to 14.46 so that to us is good progress. However, the rest of the word has gone quicker so in relative terms I have to improve. Over the other distances I've run new bests of 4:00.97, 8:31.00 over 3k (eclipsing the PB's of coach Liz Nuttall) and 31:16 for 10k, as well as winning the British trials over 5000m, so it's been a great season.

SG: How did you cope with the much talked about Doha heat and humidity?

EMC: To be honest it wasn't that much of an issue as the stadium was so well conditioned so there was no real need to do a heat training camp or change my training too much. My mum is based out there so I was pretty familiar with the climate and culture. I trained in St. Moritz, leading up to Doha, which is a temperate climate. For the Olympics next July in Tokyo I understand the stadium will not be air conditioned, so a lot more specific preparation is required.

SG: Can you give me an insight into your training leading up to the World Champs.

EMC: I've changed a fair amount in terms



L-R: Eilish en - route to her Scottish record, alongside Laura Weightman (14:44.57).

of my approach to training and major sessions. What we've observed from being around top runners such as Laura Muir at championships is that their key sessions are so intense there is a need to balance recovery. I only train once a day but I'm not so strict on having a routine that means doing 2-3 key sessions a week. If we need more recovery, we will take the extra days, so the quality is maintained.

In terms of mileage I mix my runs and key sessions with a lot of cross-training such as cycling and spinning. My mileage is around

30-40 per week so it's not particularly high for a distance runner. We are looking at a serious move up to 10,000m for the Olympics next year so I'm going to have to increase my mileage to around 50-60 miles.

Much of my training is done on my own in Manchester. Sometimes we work with Norman Poole and his group which is a great help to us. I spend a fair amount of time at training camps and really find that altitude is something that works for me. I can get away from the distractions of the 'real-world' and focus on training. St Moritz and Flagstaff are my regular destinations and take time to go to Doha where my mum and family are based.

SG: Will this be a permanent move up to 10,000m?

EMC: It's certainly in my plans to try and qualify for the 10k at Tokyo. However, if I'm good enough to qualify for both I will double in Tokyo over 5k and 10k. However, I realise we have a great quality of runner over both distances in GB so it will be a challenge.

As part of my move up distances I'm not taking an end of season break and running the Great South Run 10 – miler, before departing on a three week end of season holiday. (Eilish won the race with a new Scottish record of 51.36, previously held by Liz at 52.00).

SG: Tell me about your thoughts and



Mum and Coach Liz Nuttall (Tokyo 1991) World 10000m champion.

experiences of competing in BMC races?

EMC: As a young athlete I did BMC races all the time we would travel from Dundee to Manchester or even Watford, often on a school night. The BMC races were always on time and we knew they would be at a good pace, so they were invaluable in my development as an athlete. I'm sure most athletes in the UK really appreciate the opportunities the BMC provides for fast, competitive racing.

SG: As you're a full-time athlete tell me more about how you your time and interests outside of training?

EMC: Myself and my boyfriend (1.43 800m man Mike Rimmer) have an online coaching business runningmadeeasy.com. This works for us as we are away from home on training camps a lot of the time so we couldn't really do face to face coaching. It's been rewarding for us to see the progression of athletes who just want to improve their marathon or 5k PB. Coaching is something I may look at in the future, I can't see me utilising my degree in maths and accountancy anytime soon!

SG: Any Advice for Younger athletes, who are aspiring to become Internationals?

EMC: My mum used to say to me it doesn't matter where you are as an U17 or U20 it's what you do as a senior that matters. To be honest I didn't really see it like that, but looking back it makes so much sense, we can get so wound up in the moment we don't see the long-term picture. I made my first GB team at the age of 21, and although I was making finals of trials in my early 20's I wasn't winning until recent years.



European Indoors.

Sarah McDonald

INTERVIEW

Simon Taylor reflects on a breakthrough season for the Doha 1500m semi-finalist who broke 2 minutes for 800m at BMC Tipton.

MARK SHEARMAN



Sarah takes the British 1500m title in 2019.

All things being equal, it's fair to say when Sarah McDonald lines up for her first round 1500m heat in the Tokyo Olympic Stadium on August 3rd 2020, she will do so as one of the more experienced athletes in the British middle-distance squad.

"Yes, it's my birthday the day before, I'll turn 27, but I'm really excited." Says the Birmingham-based north-easterner who is gunning for her fifth major championship outdoors and sixth in total.

Not that she's taking being picked for the team for granted, of course. "Obviously there's an awful lot of work to be done before then, and the 1500m in the UK is so strong with the likes of Laura Muir, Laura

Weightman and Jemma Reekie so selection is no easy task," she says, "but getting to the Olympic Games has always been a dream of mine. I missed out on Rio by just 0.18 seconds so this time round I want to be absolutely at the top of my game in order to secure my spot and head to Tokyo in the best possible shape."

We chat on the day Sarah is due to embark on her Olympic odyssey with a winter training programme she hopes will take her all the way to Japan, following a well-deserved break after a successful 2019 season that saw her run PB's over 800m and 1500m and make her second World Championships team over the longer

distance.

"2019 was a bit of an odd year because it was so late," she says. David Harmer, Sarah's Loughborough-based coach since 2017, planned the 2019 campaign meticulously and clearly the hard work paid off.

"I just put faith in David in how we were going to plan it out because I just had no idea." Sarah explains. "Getting ready for a Championships in October was so unusual. David said 'This isn't going to feel like a normal year, you'll have points where you won't race for maybe three weeks' so I just had to put my trust in him really, and it went really well, I enjoyed it."

"Doha was very tough, in fact, it was

bloody awful! It was so hot and humid. I'd been in South Africa for two weeks, before the holding camp in Dubai, which was quite similar to Doha. I've never been so sweaty in my entire life. Ever! It got to a point where all your sweat patches just merged into one big sweat patch! We quickly realised I couldn't train outside when I got to Doha so all my running was on a treadmill in the hotel. I only left the hotel twice before the semi-final, to get some yoghurt and bananas!"

The springboard to selection for The World Championships came in a BMC Regional Race in Tipton when, in her last race before the British Trials in Birmingham, Sarah smashed through the 2-minute barrier for the first time, having been paced through 600m by friend and now training partner Lynsey Sharp.

"Ironically, I had been a bit unwell in the lead up to the race," she recalls, "and we just went there to have a hard effort before I went to the trials. David said not to expect anything, and even my dad decided not to come down for the race, so he missed me breaking two for the first time!"

Sharp proved a top-quality pacemaker and led through the bell in around 59 seconds, towing the Birchfield Harrier through 600m before giving way and leaving McDonald to negotiate the final half-lap on her own to become the 25th British woman to dip below two minutes with a final time of 1:59.91.

The race was a huge confidence booster, as Sarah confirms, "Having Lynsey to pace me was amazing, it was just great to go there and do it, as it proved to me that I could do it anywhere."

She is hugely supportive of the BMC and the regional races often form a key part of her annual race plan.

"I love racing BMC's," she says, "I'll always go to Watford, always go to Tipton and it's so much fun to race domestically. It's so reliable, you know to the minute what time you're going to race, everyone who goes to a BMC meet is there to support each other running quickly and the staff have always tried to help me set up races so I can run as fast as possible. Dave and I have always used BMC races to prepare for major races like the trials, because I always like to do an 800 in the lead up, and it's so much easier to go somewhere in the UK like Tipton or Watford, rather than having to fly to the likes of Timbuktu or Finland, for example. I think some athletes miss out by not doing them, but then I look at the line-up we had in Watford, with the likes of Shelayna (Oskan-Clarke), Alex (Bell) and Adele (Tracey) and it was crazy, probably better than you would

get domestically anywhere else, and the men's race was stacked as well!"

Kicking on from what the athletes affectionately nicknamed 'The Tipton Diamond League', Sarah's ticket to Doha was confirmed with a dominant win at the Trials, kicking clear of Jemma Reekie in the home straight having raced on instinct, rather than to any specific race plan.

"Previously, I had been good at racing instinctively," she explains "but sometimes in 2018 it was almost like David would tell me how to race, but this year, rather than saying 'go at this point' he just told me 'you'll know when to go, so just do it then' and I think that was clear when I made the decisive move at the Trials."

Instinct also played a part when it came to the semi-finals in Doha. Having qualified from the opening round with ease, Sarah found herself leading through a pedestrian opening 800m in 2:28.25. "It wasn't planned!" she is quick to point out. "I just wanted to get on the rail and then I presumed someone would go ahead as there were quite a few in the field who would normally lead." Sarah's growing maturity showed as the race unfolded and instead of panicking, she got her head down and dug in. "I wasn't overly comfortable," she says, "but when I realised what was happening, I just had to deal with the cards I'd been dealt."

In one of the events of the Championships, even a 58-second lap wasn't enough to secure one of the 12 final berths, but Sarah is adamant the effort was not totally in vain and will stand her in good stead in the run up to Tokyo.

"It was an experience," she says, "if you look back at me in 2017 when I went to Worlds I never would have led like that, but I'm a lot more confident now, you can see that in the way I race and the way I train, and how I conduct myself around the circuit."

Sarah sat open-mouthed in astonishment as Sifan Hassan destroyed the field and the Championship Record with a dominant victory in 3:51.95.

"I couldn't speak," she recalls, shaking her head with incredulity. "I was in a state of shock for about ten minutes. I was in the stands with Jemma Reekie and the Australian middle-distance runner Linden Hall and we just couldn't believe it. I remember with two laps to go Jemma asking me if it was quick and I said 'Jemma, if they 64's for the last two laps it'll be about 3:58 and they're not going to slow that much!' It was crazy, Laura ran incredibly well but it's mind-blowing that 3:55 didn't even get a medal. But I did watch and think 'I want that too!'"

Watching the 1500 final in Doha has left Sarah in no doubt how much work needs to be done if she is to make the final in Japan next August, and the process of getting there starts now, albeit with her least favourite training block of the year.

"There's a quicker turnaround this year with the World Champs having been so late," she says, adding, with a grimace "I just want to get strong and work on my aerobic capacity; all the stuff I don't really like doing."

Having Sharp as a new training partner in Loughborough eases the burden somewhat, however. "It's great having Lynsey here for winter," she says, "because she doesn't like the long stuff either, so we'll kind of get through it together. Before, I was the shortest distance runner in the cross-country sessions and I hated it but now I've got Lynsey so it's OK!"

Sarah makes the 90-miles round trek across the M42 to Loughborough three times a week for key training sessions and to meet up with her coach. "It's good for me to see David," she explains, "I like to do my workouts there with him as it makes me push that bit harder and I've got the support. I do some of my Strength and Conditioning in Birmingham as the Uni still supports me with an alumnus scholarship but most of the main work is done in Loughborough."

A typical training week in winter comprises a long Sunday run of 10 to a maximum of 13 miles on the canals or trails of Birmingham, for so long the staple training habitat of the city's distance



World Champs semi-finalist.



British Indoor Champs
runner-up 2019



Among the pack before pulling clear
in the British Champs 1500m.

running community, as she doesn't like to run on pavements.

Monday is another steady run plus some drills and strides, followed by possible another run in the evening.

"Tuesday is my big session day!" she tells me. "I'll do a tough session, normally at this time of year it will be timed efforts like 3:00 with short recovery on grass, followed by gym and another run."

Wednesday is a recovery day, "I'll do a 7 or 8 mile run, which doesn't sound much like a recovery day right now!"

Thursday is more quality work, such as tempo or a progression run and some hurdle drills, whilst Friday is another single recovery run before another big session day on Saturday, "hills or grass...or something equally miserable!" she says, adding "I'm on a

10-day training cycle so the way it normally works is every other week I'll have a Monday or a Wednesday off."

Summer training follows a similar pattern to winter, but features a lot more track work. "In the summer I find it hard going from doing next to nothing to doing a track session the next day, so often I'll do tempo or progression strides the day before or else I tend to feel a bit sluggish warming up."

With the Countdown to Tokyo now well and truly under way it's crucial that coach and athlete collaborate more closely than ever if Sarah is to achieve her goal of lining up in an Olympic Final in what is now merely a matter of months, not years.

"David has been great for me," she is quick to attest, having moved from Bud Baldaro's guidance a couple of years ago, "Bud was

amazing, and had helped me for so many years, but I felt I needed to make a change to move to the next level. It was the right decision, but it was really hard – it was like a break-up!"

"But Dave and I work well together and get on well so it's effortless to work with him. He is just so meticulous in his planning. He's also very annoying because every time I think he might be remotely wrong he's always right, it annoys me!"

"Reaching the final next year is definitely the goal," she says in conclusion, "when you reach the final at that level anything can happen in the 1500. It depends on the race and where you're positioned so I've got to work on tactics and getting through the semi-final. I really want to make my family and all my support team proud".



McDonald takes the Watford GP 800m win.

BMC Academy Camp

DAVID LOWES



DAVID LOWES

This year's Residential Camp at Spinkhill, which ran from October 25-27 was one of the toughest ever writes Academy Chair, **David Lowes**.

With another 80 attendees including coaches, the training continued its theme of hard work. However, this year's camp had the added obstacle of diabolical weather. With this being my 15th year at this venue and my 30th in all, we have had the odd rain shower, but this time it rained monsoon-like from Friday lunch until Saturday evening.

The water accumulated so badly that it left our normal training routes inaccessible and some quick decisions had to be made. Of course, we are athletes and a drop (many drops) of rain does not mean we don't train!

Avoiding the lakes of water wasn't a problem and the athletes got stuck in, literally in some cases in the ankle deep mud. No-one shirked the task of 8x3min with 1min recovery or the 6x3min for the younger group. Everyone was very wet and muddy, but I suspect there was a sense of



DAVID LOWES

DAVID LOWES



DAVID LOWES



satisfaction in conquering the far from ideal conditions.

All the usual ingredients of a 20-25min early morning run were done with educational sessions and drills and exercise-based workouts along with many fun elements. With Saucony being our new sponsors, they kindly designed t-shirts for the athletes and coaches and I'm sure these will be worn with pride at future training sessions.

Dan Studley, from Loughborough, a Saucony sponsored athlete came as the guest this year and his story was based around "Nowhere to Somewhere ... and Beyond". As a youngster, his times were fairly poor and the interview was designed to give the youngsters in the audience encouragement that success can take a long time and that enjoyment should always be first and foremost, along with a lot of patience.

At the end of the camp, a lot of tired, but happy athletes went home, hopefully taking confidence from the continual encouragement that was on offer throughout the course. Everyone was a winner in the eyes of the coaching staff.



2020 BMC Horwill Research Scholarship

Outline

The BMC Horwill Scholarship was established in 2008 and the aim of it is to help the British Milers' Club progress middle distance running.

The BMC aims to support coaches who train athletes, and one way in which we do this is to present the latest research to them. In order to be proactive in this area, we have established this scholarship.

We wish to encourage original and innovative pieces of research into middle distance and endurance running and we are offering a scholarship to help at least one individual pursue a selected topic or area.

In order to apply for the scholarship you will need to complete the application form and return it to us by 31st Dec, 2019. The applications are then assessed by the BMC and shortlisted candidates will be invited to a short interview to discuss their research proposal.

Successful candidates will then be offered a scholarship up to a maximum value of **£2000**. Once the funds are awarded you will be expected to conduct your research and present your findings to us. You will also be expected to write articles for our magazine and website.

Frank Horwill MBE

The late Frank Horwill MBE was the founding member of the BMC in 1963. As well as working tirelessly for the Club, Frank became extremely well known for his work on research and collating research from around the world on middle-distance and endurance running. In order to safeguard his tradition, this scholarship has been established

The Research Scholarship

The Scholarship Award for 2020 will be up to £2000. The award will be paid in stages – some at the beginning, middle and end. Once the award has been made you will be expected to sign a contract to conduct the research and present the findings to the BMC. The BMC will then part-own the research with the researcher and it will be made available to all BMC members.

Once the research is complete, the researcher will be expected to present their findings to a BMC seminar/conference. On completion you will be awarded a commemorative medallion.

If you have any questions please do not hesitate to contact Paul Hayes on 024 76 464010.

Send all completed applications to hayespaul43@yahoo.co.uk

2019 BMC Horwill Research Scholarship

BMC HORWILL RESEARCH SCHOLARSHIP WINNER DR JESS COULSON INVESTIGATING CHANGES IN MUSCLE AND NERVE FUNCTION OF FEMALE ENDURANCE ATHLETES ACROSS THE MENSTRUAL CYCLE

The question

The menstrual cycle is a regular and normal event for females, and although we know a number of hormonal changes occur throughout the cycle there is little evidence to demonstrate how it may affect neuromuscular performance. For coaches and practitioners working with female athletes this can lead to conflicting training strategies and uncertainty when dealing with menstrual cycle symptoms and oral contraceptive pill use.

Background

Occurring monthly as part of a natural process for most females, the menstrual cycle is essential to maintain bone health and fertility. It generally starts any time from the age of 12 years and continues until the onset of menopause around the age of 50-55 years. The cycle typically occurs over a period of 28 days, with the first 14 days known as the follicular phase. During this phase, around day 10, the hormones oestrogen, LH (luteinizing hormone) and



Dr Jess Coulson in action at the BUCS champs 2012

MARK SHEARMAN

FSH (follicular stimulating hormone) rise, reaching their peak around day 14 [1-3]. LH reaches a level around double that of both oestrogen and FSH, and rapidly drops off after day 14, while oestrogen and FSH fall off more slowly over a 5 day period. The latter 14 day period is known as the luteal phase and there is a gradual increase in another hormone, progesterone, which reaches a peak around day 22 and returns to base levels at day 28 [3]. Oestrogen is a key regulator of bone resorption, and insufficient amounts of it result in an excess of bone being broken down with little new bone being formed, making the menstrual cycle an essential tool in maintaining bone structure [4, 5].

Current Understanding; Mixed messages

Certain stages of the cycle are often perceived to have the potential to cause a decline or change in certain aspects of sports performance and training. In a recent study 51% of athletes suggested that their symptoms associated with the menstrual cycle adversely affected their performance [6], with 36.7% of elite athletes reporting heavy menstrual bleeding to be negatively influencing their performance [7]. A further large-scale study of 194,054 females showed that 16.5% of them within the UK population, both active and non-active, were using the combined oral contraceptive pill (OCP) [8], and importantly, 74% of which confirming they used the pill to manipulate their cycles according to training, performance and life events. There appears to be no difference in the prevalence of oral contraceptive use between elite and non-elite women [9] and it is probable that

the use is for the same reasons. There is, therefore, a clear need to better understand the more detailed aspects of neuromuscular function across the cycle, and if or how it may be manipulated with the pill.

Studies to date have reported a variety of alterations during the menstrual cycle, including changes in muscular performance [10], an increased injury risk [11], increased laxity of tendons and ligaments at the luteal phase [12] a reduced neuromuscular performance in both regular [13] and abnormal cycles [14]. A further study used MRI scanning to quantify oedema and its relationship to athletic agility across the menstrual cycle [15], and suggested that increases in fluid retention within the muscle compartments may be the cause of fluctuations in neuromuscular performance. However, many of these studies are inconsistent with the definition of the menstrual "phase" and have often used unreliable methods to define it. There is a distinct shortage of useful data exploring these potential changes at the intramuscular level, more often than not making assumptions based on basic measures of muscle strength. These gaps in scientific knowledge must be addressed in order for coaches of sports to knowingly train their female athletes with the most appropriate exercise for any given point in the cycle.

Updated Methods

Intramuscular EMG (iEMG) is a well-established method [16] and by closely measuring the electrical activity of muscle fibres, it is able to identify changes in neuromuscular control and changes in the

communication between nerve and muscle. Studies have been performed in young and old, athletic and non-athletic populations [17-19]. There are no studies to date with this level of detail in young females, nor are there any associated with the menstrual cycle, menstrual cycle irregularities or oral contraceptive pill use. It is for this reason that we wish to carry out this investigation to provide firm, reliable evidence on the neuromuscular changes across the menstrual cycle (regular cycles: eumenorrheic (EM)) and with those taking OCP's.

Aims and Objectives

Aims: The aim of this project is to map neuromuscular performance across the menstrual cycle (or withdrawal bleed for OCP users) in female endurance athletes.

Current data

A sample of our data currently shows no major differences in neuromuscular control between the three phases of the menstrual cycle, the stages of oral contraceptive pill use or between eumenorrheic (EM) and oral contraceptive pill (OCP) users. Preliminary data has been assessed from a force tracking task (demonstrated in Figure 2). Measurements have been taken at three different levels of contraction; these are 10, 25 and 40 % of each participant's maximum voluntary contraction (MVC) of the quadriceps muscles. Force tracking shows the percentage of variation for each participant in being able to sustain a contraction for a set period of time *i.e.* a variation of 0% would mean that the participant was able to sustain that contraction perfectly without any deviation from the target line, demonstrating perfect neuromuscular control. Of the participants we have measured, we have seen an extensive amount of individual variability but no consistent pattern, within OCP users and EM.

However, it is still very early days and we have not yet analysed enough data to make any firm conclusions. The research is continuing and we expect it to be complete early next year.

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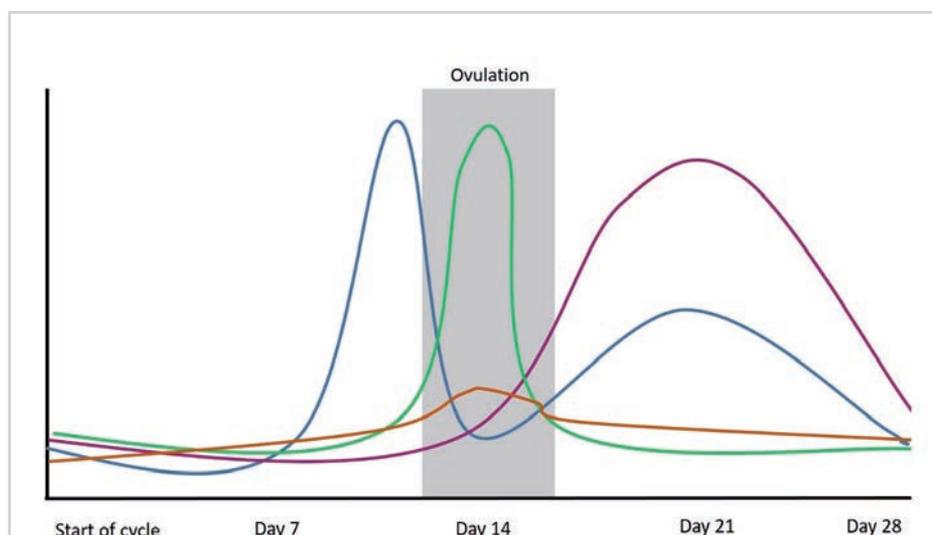
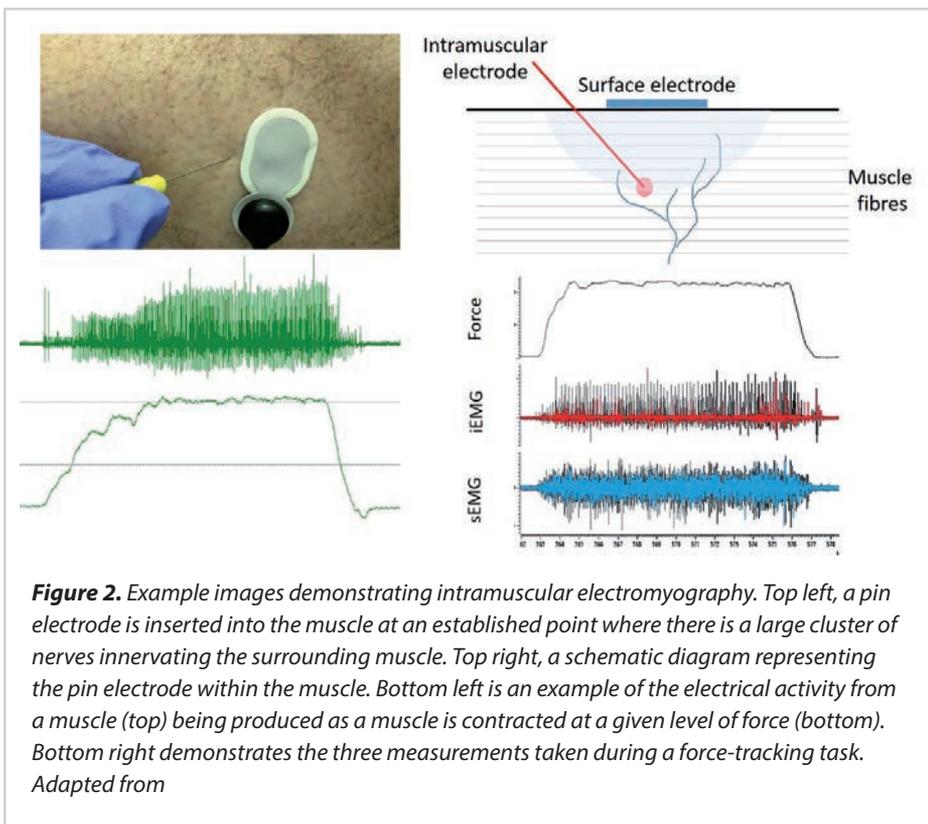
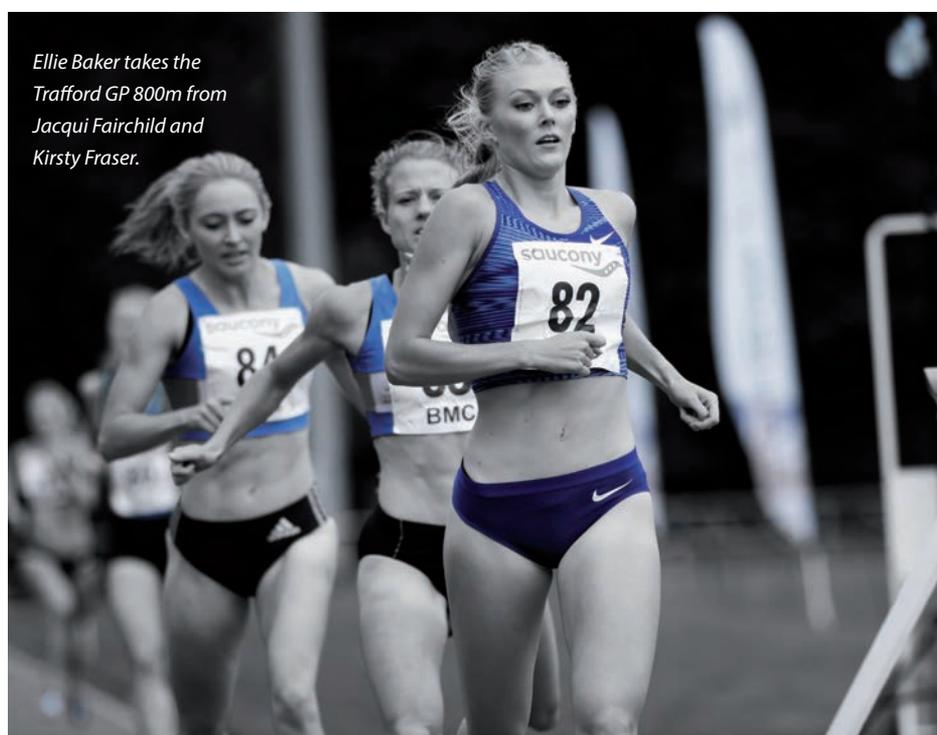


Figure 1. Average duration of cycles and fluctuation of hormones. Blue: Oestrogen, Purple: Progesterone, Green: Luteinizing hormone (LH), Orange: Follicle Stimulating Hormone (FSH).



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DAVID LOWES



Dustin in action in the Manchester International this year.

MARK SHEARMAN

Oliver Dustin

Kevin Fahey interviews the European U20 800m champion, who ran 1:46.84 to win the B race at the Watford GP.

When it comes to unravelling the alchemy of how to become a successful athlete then Oliver Dustin appears to be well placed to succeed.

The 18-year-old 800m runner has already proven this summer that he is one of the brightest young talents in the country, not just from smashing his personal best to move into the top ten of the UK All-Time List for under 20 men but also because he showed he knows how to win on the big stage, claiming gold at the European Junior Championships in Sweden.

Dustin also has a sharp mind to go with those quick feet as last month as he began a four-year degree in chemistry, which will lead to a Masters qualification, at Birmingham University.

The Cumbrian from Workington spurned offers to lure him to the American collegiate system, preferring to stay in this country and continue to work with long-term coach Graeme Mason as he seeks to make that jump for outstanding junior to a successful senior.

"I am very excited about starting at Birmingham University," said Dustin.

"I had options to go to the US but as I have improved so much this year more support has become available to me in this country so I don't have to go to America.

"I have a scholarship to help me at Birmingham Uni and the athletics set-up there is fantastic. I know Thomas Keen (GB junior 1500m runner) is also coming while Isabelle Boffey is a year above – so that means both European Junior 800m

800m victory at Watford in 1:46.84.



DAVID LOWES

champions are now at Birmingham!

"I am so looking forward to being there and starting something new."

Dustin is clearly ready for a new environment, new training partners and a new way of life but his move to Birmingham isn't a complete overhaul in what got him to this point in his athletics career. Dustin is astute enough to acknowledge that his close relationship with Mason is one of the key ingredients in the subtle alchemy of sporting success.

"While I may join in with group training sessions at Birmingham Graeme is going to remain my coach," added Dustin.

"We get on so well and have a fantastic relationship. We are on the same page on how my career is going to develop and he has been a massive part of my success and I couldn't have done it without him.

"He knows what works for me and makes me tick. I have been with Graeme since 2011/12 and I know he is always reading new stuff about training methods and the sport so he is learning all the time and I get that benefit.

"While I am ready for a change in environment, we have talked a lot about our long-term approach to the sport and the development of my training.

"Winning the European Under 20s 800m title was an amazing experience but in the future I want to be there at Olympic Games and winning British senior titles.

"I want to enjoy a long senior career and not just be good for four or five years. We are looking ahead and coming to Birmingham University is a stepping stone in that process."

While Dustin has his sights firmly on the future there is always time to reflect on his amazing summer and that magnificent race in Sweden when he led a stunning British clean sweep of the medals with Ben Pattison and Finley McLear second and third respectively.

"That was the craziest race ever!" said Dustin.

"I will never forget that noise down the home straight, I couldn't hear myself think. Because it was one of the final events the whole GB team were watching and as we were all straining towards the finish line people were screaming at us.

"It was such a special moment to lead home a British 1-2-3, which I gather has only happened once before with the men's 200m.

"It was surreal, though we knew it was a possibility as we have the top six fastest men in Europe. Standards are so high in the 800m at the moment."

The fastest of the lot, Max Burgin, sadly had to pull out of the Europeans with injury but Dustin was keen to praise his rival after

his stunning time of 1:45.36 to win the trials race and England U20 title took him to the top of the UK All-Time Lists.

"Max has dragged everyone else in this country up to another level because when we saw him run 1mins 46secs and then 1:45 then we all start thinking 'why can't we run those sort of times as well?'" explained Dustin.

"If you see someone of your own age run 1:46 then it motivates you to training harder and race faster. It is a great environment for junior 800m runners at the moment.

"I know not everyone will make it into the senior ranks but out of the six or seven of us (GB has eight runners in the top 11 of the European U20 Rankings this summer) then you would hope that one or two of us would make it as top seniors."

Dustin hopes to be one of those and certainly for the foreseeable future he will

include BMC meeting in his racing schedule having been a regular in recent years, including his first Grand Prix A race win at SportCity this summer and then that PB of 1:46.84 to win the B race at Watford.

"I didn't run the smartest race at Watford so I feel there is more in the tank but I am still learning how to run the 800m," said Dustin.

"But I love the BMC races as they are so competitive and you don't have to travel all around Europe to get a fast time – just two hours across to Manchester will do!

"The structure is excellent and they have to be one of the reasons why the under 20s are doing so well. We have a lot of opportunities for racing fast times."

And in the meantime the hard work continues because as an aspiring chemist Dustin will know that there is no magic short-cut to finding a winning formula.





Sir John Walker takes Olympic
1500m Gold in Montreal

Sir John Walker

ALASTAIR AITKEN SHARES A REMARKABLE INSIGHT INTO CAREER AND THOUGHTS OF THE 1976 OLYMPIC 1500M CHAMPION AS HE RETIRES FROM PUBLIC LIFE.

The most prolific miler in history, to my mind, would be Sir John Walker, from New Zealand. He ran 3:58.8 in Victoria in 1973 and 3:54.57, when winning in Auckland, New Zealand in 1985. That was his 104th sub four minute mile that he did.

At the end of his career, when in his late 30's and, as he approached 40, he was still running 1500's, as fast as ever, and his prolific streak ended after 135 sub 4's!

He was the first to ever break 3:50 for the mile with 3:49.4 in Gothenburg on the 12th of July 1975.

In 1976. He took Michel Jazy's 2000 record off the books, slicing no less than 4.8 seconds from the old mark.

John Walker's best competitive years were in 1974 to 77. He was unbeaten over 1500m/mile all year and won the 1500m Olympic Final in Montreal.

It appeared after that, problems with leg injuries and stomach cramps started to play a part and he had to drop out in one important race, which was in the very first World Cup

1500m, in Düsseldorf in 1977, when Steve Ovett won very convincingly in 3:34.05.

John always, a fighter, never gave up and got a silver medal behind Steve Cram in the 1500m at the Commonwealth games in Brisbane in 1982 (1 Steve Cram 3:42.37; 2 John Walker 3:43.11 3 Mike Boit from Kenya 3:43:33) (Dave Moorcroft won in 1978 in 3:35.8).

Also one must say John Walker came 3rd over 800 in 1:44.9 in the Christchurch, Commonwealth Games, back in 1974 and another fact, not to be forgotten was, that he broke the 1500 World Indoor record back in 1979 with a time of 3:37.4.

Steve Scott, the American runner, did run a lot of sub 4 minute miles and was World class but not an Olympic Champion like John; and, John battled with two very good Irish runners indoors Eamonn Coghlan & Ray Flynn besides Scott also.

I had so much pleasure in watching John accelerate, with his withering last 300m, as he built up the momentum to the finish, in a mile race, at Crystal Palace, beating a World-



Walker in action
in the 1990's.

class field. The 'All Black' kit, flowing hair and powerful stride from the 6ft New Zealander, was something one could never forget.

Then there were the other two talented New Zealanders around at the time, Dick Quax and John's friend Rod Dixon. The latter finished third in the Munich Olympic 1500m of 1972 and eleven years later won the New York City Marathon. An extraordinary double act.

Sir John George Walker KNZM, CBE.

Not all of John's life was a bed of roses by

any means... He got Parkinson's disease in the 1990's and, in September 2019, he had to retire from his work as a Councillor for Auckland, New Zealand. The reason was it really became far too difficult for him to carry on.

He had done a marvellous job. It was due to him Auckland's children got free swimming pool entry and free lessons, so, they could learn to swim and, there were other things he achieved as councillor of course. When we met several times in England, John struck me as someone who did not suffer fools gladly and, he was always a direct, courteous and a clear thinker with a sharp wit.

He was so popular in New Zealand; they built a statute of him in bronze. Obviously it must have been modelled from an action shot when he won the 1976 Olympic 1500, wearing his Olympic race number on '694' that statue can be seen at a Manurewa town centre, NZ. That was the place he was born, on 12th of January 1952.

His wife Helen has been such a support for him and his daughter Caitlin assisted him to the lectern for his short but final speech before he bowed out:

"To the Councillors who have helped me out of my chair and, brought me tea and coffee. Thank you, thank you. You know who you are."

"I was raised in Manurewa and it seemed the perfect way for me to repay my home town for the love and support that I had received as a child and then during my long running career."

He made some interesting observations about other great athletes in 1976' he respected. One is Peter Snell, of course a fellow New Zealander. Kuts, Ryun. And Zatopek. He said something to me about another athlete in 1985: "I think Sebastian Coe is the most majestic runner I have ever seen, anywhere in the World. If you can compare an athlete to a thoroughbred he has certainly been it. He is not running badly right now."

Arch Jelly, John Walker's coach commented that John was good at all sports...he was good at tennis and badminton. John came to Arch at 19 really when he started training seriously. He got stuck into it with obvious results.

John Walker recalls, "My first race was when I was 10 years old running in primary school I won it and everything started from there But I never really got interested or concentrated on running till I was about 17 or 18."

When we first met in 1976. I asked him what it is about athletics he liked most.

"First of all I love racing that is prime. Secondly being able to travel as much

as I do and, thirdly, meeting so many interesting people."

"Naturally I think athletes are very good sort of people because they are clean living, they all enjoy the same sort of thing and it is a very healthy sort of a life. It is good to feel really fit. It is a sport that depends purely on the individual, he'll get as much success as he put in, naturally you have to be born with some sort of talent and I think a lot of people are, whether it is playing a piano, running or whatever."

"I think you have got to have the ingredients there to start with. I think I was very lucky to have this as my father was a runner and I have virtually inherited it from him. But I still had to work upon it and it has not been easy, though maybe I have had it a little easier than some other people," he added.

I pointed out to John that he ran 3:38.0 for the 1500m in 1973 before the Commonwealth Games of 1974. Would he consider that his breakthrough race?

"I suppose as I had beaten Benjamin Jipcho, Rod Dixon, Dave Wottle and a few other top guys, that was the starting point but unfortunately I had not had sufficient experience before the Commonwealth Games."

That 1500m race at Christchurch was a very fast race and both Filbert Bayii and John Walker in second place, beat the previous World best by Jim Ryun (3:33.1) with 3:32.16 & 3:32.52 but John did go on and beat Filbert Bayii the next time they met.

Looking back to what John thought, in 1976 and which races did he consider were his greatest races at that stage of his career?

"I think breaking the World record last year for the mile and running under 3:50 would have to be the greatest that ever happened. The world record was virtually a time trial and probably another great satisfaction was running 3:32.4 for 1500m and missing the World record by two tenths – but that was also a great disappointment of course."

"Those were time trials virtually running against the clock if I was to think back to my greatest race, the Olympic would be one of them, because to beat the whole lot of them would have to be stand out experience."

He then made an interesting comment about his stay at the Olympic village, "I think when sitting in the Olympic Village for 2½ weeks, facing four walls and criticism from reporters and finally you go out there, you run, then you win, naturally it is going to be a hell of a relief. It is all over; four years of really hard work. It is everything that a Person has dreamed about, winning the Olympic gold medal; that's it, it's all finished."

1976 Olympic 1500m Final

1 John Walker (NZ) 3:39.17; 2 Ivo Van Damme (BEL) 3:39.27; 3 Paul-Heinz Wellmann (FRG) 3:39.33; 4 Eamonn Coghlan (IRL) 3:39.51; 5 Frank Cement (GBR) 3:39.65; 6 Rick Wohlhuter (USA) 3:40.64; 7 David Moorcroft (GB) 3:40.94; 8 Graham Crouch (Australia) 3:41.80.



Sir John alongside Seb Coe in the late 70's.

MARK SHEARMAN

The Max Factor

INTERVIEW

Steve Green talks to Max Burgin and father and coach Ian Burgin about what has been a mixed year for the European Junior 800m record holder



MARK SHEARMAN

Bedford 2019 - Burgin en- route to his 1:45.36 new European Junior Record

June 23rd 2019, eight young athletes line up for the final of the England Athletics Champs 800m. Max Burgin goes to the front and the only athlete brave enough to follow him is Oliver Dustin. The Bell sounds a fraction over 52 secs.

The Halifax athlete is clear and running strongly, we turn our attention to clock as Burgin powers down the straight. It stops at 1:45.36, a new British and European Junior Record, eclipsing David Sharpe's mark from 1986 (1:45.64). The crowd gasps and then cheers as much in awe and admiration as Ben Pattison and Finley McClear follow with breakthrough performances of 1:46.77 and 1:47.33.

I congratulate Max and Father Ian (a 1:48.67 800m man) on their season. I receive the characteristic Yorkshire response of. "It was good but wouldn't say great as it was just five races so who knows how fast Max could have gone", said the elder Burgin. They are referring to the injury which kept Max out of the European Under 20 champs, where Dustin led a clean sweep and the World trials.

"It was a shame he couldn't run at the key champs, but the record was a great achievement. It was a learning year, we would say, even his last race at the Birmingham Diamond League (where he ran 1:47.99) was useful as we were able to go through the process of what happens at those kinds of events, and Max was able to toe the line with some of the top guys around", Ian reflected.

Max answers questions very much in unison with his father and shows a maturity one would not expect of a 17-year-old in analysing his season and performances. He recalls the European Under 18 championships of 2018 in Győr, Hungary, where he had calculated that most people were speed based fast finishers, so he decided to employ front running tactics for the first time. He duly ran away with the title in 1:47.36 another U18 GB record, eclipsing the mark he set in the BMC GP at Sportcity in May 2018 when winning the 800m A race in 1:47.50.

Burgin's progression in the sport has been pretty much the stuff of schoolboy dreams. In five years, he has gone from 2:14 as an U13 to his present British record mark aged 17.

Along the way there have been several standout performances, including a British Under 15 record (1:54.36) at the 2016 Mark Sesay memorial 800m race; where the incentive was a new computer from his father.

In 2017 he was setting new standards again with 1:49.42 at BMC Trafford to take the age 15 best. A win at the 2017 Schools international was another highlight of the year, following defeat by Dustin a week earlier in the English schools. He reflected, "I was disappointed to lose at the Schools, but at the end of the day he's a great athlete and I knew I had the chance to win again a week later, which I did."

The performance that got everyone talking came at Loughborough BMC this year, the week before the England Champs, when placed against a top domestic field he followed the pacemaker Reece Ingley through 800m in 52.4 seconds and cruised away to light up the meeting in 1:46.80, a British Under 18 record, before it was eclipsed at Bedford.

We discuss the training that has got him to this elevated position. Training is very much a family effort with Grandad Brian and Ian guiding their young protégé. Brian has always been active in a multitude of sports and much of his work in Rugby League, disability sports, and athletics influence Max's programme.

"We do around 30 miles a week, with the usual mix of longer runs (maximum 8 miles) track and hill work, Halifax is a hilly area so there is no shortage of opportunity in that area," they add.

Key sessions during winter on the Spring Hall track include the staple short recovery 400m sessions and longer runs. In summer typical training involves 200m reps with long recoveries. A key indicator of race readiness is a 600m session which pre Bedford was

run at around 77 seconds. Max's training partners are a mixed ability group including some sprinters to push the faster reps.

The Burgins are advocates of XC racing in the winter and Max is a regular in the West Yorkshire League and Northern XC champs. The weekend of the interview the young Harrier ran in the Northern road relays for his club.

"Max is never going to be the best at XC, but it's a good chance to do sustained runs and it's an escape from the track work, and also builds strength", says Ian.

The Burgins recognise the role the BMC has played in the Max's development and Ian is quick to pay tribute.

"With the BMC we know we are going to get a fast race, without having to go abroad with good pacers, for Max also and others it's a chance to race and learn against senior athletes. Last year at Loughborough he was up against some of the top boys and got pushed and barged a bit, so we took that forward into future races", Ian enthuses.

"The Watford race, where Jake Wightman took three Brits under 1.46 and most of the top guys turned up, was a race we fancied, but the timing wasn't right for Max, but it was an example of what is possible in the UK with the BMC, so we are really grateful to the club", he adds.

We talk of the future and what is next for Max following this heady, but frustrating year.

"Max still has a couple of years in the U20 age group, so World Juniors next year are a priority. If he continues his progress then the Olympics may come into the equation but that's not our priority, and there are a lot of quality athletes around", both are quick to point out.

I end this illuminating interview with Father and Son with the question of what Ian believes the qualities that have made Max the standout young athlete in generation.

"It helps to have a bunch of British athletes such as Oliver Dustin, Alex Botterill and also runners closer to Max's age such as 1:46 runner Ben Pattison and 1:48 runner Oliver Carvell, who are running such quick times, so push each other on. As an individual Max is focused and can channel his nervous energy into the race, for us the focus is being able to run fast times in races and not just in training," Ian replies.

It is clear a plan is in place to channel the potential of this precocious and level-headed young athlete. We look forward to seeing Max and the other UK talent of the millennial generation blaze a trail in next decade.



MARK SHEARMAN

Boffey edges Sclabas to take the Euro U20 800m title with Keely Hodgkinson in third

GETTY IMAGES



Isabelle Boffey

Isabelle Boffey's progress is clocked by Matt Long who is joined by a coach gunning for success.

It's a wet autumnal day at the University of Birmingham and the teenager I am chatting with could be any fresh faced student of Biomedicine, who is just about to head off to the lecture theatre. Time is of the essence for this young woman. Like many of you, she has to juggle training around her intense studies. The appearance of the University's Head of Athletics beside her, reveals however that this is no ordinary student athlete. Isabelle Boffey is already a European under 20 - 800m champion and four times national steeplechase champion Luke Gunn, is the coach who has been there, done it and got the proverbial tee shirt that she is after.

So what of that fantastic two lap triumph in Boris in July? After navigating her way through heat and semi-final, Issy recalls that, "In the final I knew it was going to be a quick race. After watching the race back

I didn't realise how far ahead the Swiss girl, Delia Sclabas, had got. But during the race I just tried to follow the plan that Luke and I had come up with. My kick is the strongest part of my race currently and down the back straight I could see myself gaining ground and after overtaking Delia with 100m to go I just went for it. I think I was actually more excited about the time (2:02.92) over the win!"

I remind her that she's also a British Universities two lap champion (both indoors and out) and am keen to know how she is finding the student competition circuit. With gusto she reveals, "BUCS was such a fun competition for me this year, as a first year I didn't really know what to expect but it was such an amazing weekend. I'm also going to be Co-Track Captain this coming year meaning I'll be a lot more involved in the whole competition". Does she struggle with balancing her running with her studies I wonder?

She is clearly a fan of the set up at

Birmingham University, pointing out that, "As a scholar I have an amazing team around me who help me train and manage my studies, with the track and gym being so on campus it's easy to get to and from training. I have also introduced S&C and physio as part of my weekly training programme. Coming to train with BUAC was an overwhelming experience. There are so many of us training at the same which means that I always have someone doing sessions with me and I love being able to train with other 800 runners such as Mari Smith and Emily Thompson who push me in sessions".

She is keen to credit the coaching from Douglas Stone at Enfield and Haringey before I move on to ask what it is about Luke Gunn's mode of coaching that makes them click. With a smile she points out that, "Luke always seems to know what's best when it comes to my training, my favourite sessions throughout the year are definitely my race prep sessions which usually consist of shorter reps with long recovery but flat

out. These always seem to get me in the right frame of mind before a big race as well as helping me feel physically ready by going at race pace”.

At this point I turn my attention to three times Commonwealth Games chaser, Gunn. I remind Luke that I’m aware that Issy has competed this last season both over 400m and 1500m with the Loughborough international. I want to know if this was deliberate strategy in terms of progression from being an event group to an event specialist athlete.

Candidly he discloses that, “We planned in a 400m in the indoor season off very little speed work to make sure that we hadn’t negated one of her strengths during this aerobic phase before the upcoming 800m races - and both of us were stunned that she ran a 54.30, from a standing start, without any specific work for the event! Her 53s 4x400m split at the European U20 Championships, which came after three 800m races in preceding days, shows just how fast and powerful Issy is. The 1500m was actually planned in to give us a benchmark, to judge her aerobic development in the coming years - her 4.20

on her debut at the event was an incredibly pleasant surprise”.

As a distinguished Team GB and Team England runner for the last decade and more, I ask what Luke’s own international career can bring to the table in terms of the development of Issy’s race craft. With typical modesty he assesses that, “I can honestly say, coaching at the international level is completely different to competing and each athlete needs different input on race day. Most of my input has actually come from watching national and international 800m’s in the past few years - which are just like huge physical games of chess played at an intense speed!”

He is understandably keen to credit the wisdom imparted to him by his own former coach and colleague at BUAC, Bud Baldaro, who was of course a popular recipient of the BMC’s Lifetime Services to Coaching Award several years ago. With conversation focussing on our club, I am keen to know how the BMC has aided Issy’s development and emphatically she responds that, “I view BMC as a vital part of any UK distance runners season. I think

I did my first BMC race in 2016 which actually happened to be the year where I got my first GB vest, I also got my first senior England vest through an indoor Sheffield BMC meet”.

I ask both how winter progress will be benchmarked with Luke explaining that lab testing is available to his athlete as part of the British Athletics Futures Scheme before playfully adding that cross country could even be on the agenda! He says shrewdly, “The main thing will be keeping patient with her progression from junior to senior ranks”. Issy has a lecture to dash off to and has one eye on the clock.

I sneak in one last question about her long term ambitions in the sport. Her face full of animation, she maintains that, “every athlete wants to make it to the Olympics and that will always be the ultimate goal. I would definitely like to go sub 2.02 and even quicker if everything goes to plan this season”. As she disappears amongst the throng of fellow undergraduates I am left feeling that Isabelle Boffey is a young woman whose hectic life is led with one eye on both clock and stopwatch. With Luke Gunn’s guidance, her time will surely come.



Boffey powers to Manchester
International victory over two laps.

MARK SHEARMAN

41 Days

THAT SHOOK THE WORLD

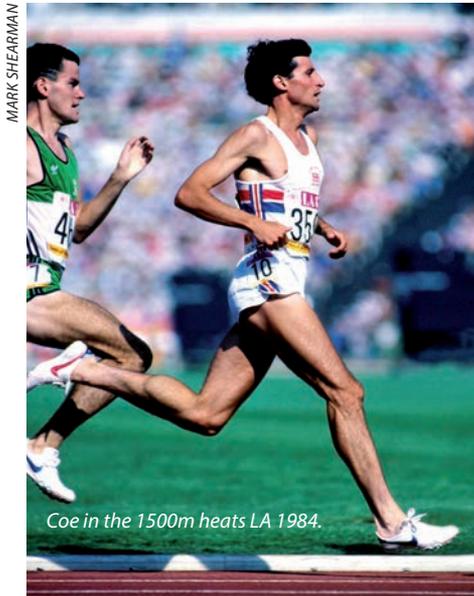
INTERVIEW

The man voted as *The Greatest Miler Of All Time*, Sebastian Coe, rereashes Matt Long's memory about 41 days that changed middle distance history.

MARK SHEARMAN



Exhultation and vindication Moscow Olympic 1500m Gold ahead of Jürgen Straub in 1980 following his silver medal in the 800m behind Steve Ovett.



Coe in the 1500m heats LA 1984.



Stuttgart 1986: Famously quoted as 'Three Spitfires coming out of the Sun!'
Coe powers to Euro 800m gold ahead of McKean and Cram.

July 17th 1979. Bislett Stadium. Oslo. Norway.

Lining up for the start of The Golden Mile are 13 men whose collective presence constitutes the best field ever assembled for a race over four laps of any athletics track in history. There's Kiwi, John Walker who brings to the table not only his world record of 3:49.4s but his status as reigning Olympic 1500m champion, which he achieved in Montreal three years previously. Then there's the two-time American champion Steve Scott, who sports an impressive 3m53s clocking over the imperial distance. At 24 years of age compatriot Craig Masback sports a PB just a second or so slower than the aforementioned Scott.

Europe has considerable presence in the shape of continental record holder (3m52.4s) Thomas Wessinhage of Germany and the so-called 'Chairman of the Boards' - Irishman Eamon Coghlan, whose world leading 3m52.9s means he is a definitive threat. Heading the challenge for Team GB is reigning Commonwealth 1500m champion David Moorcroft (3m55.1s) and 22 year old Jon Robson (3m54.3) who took bronze behind Moorcroft in those Edmonton Games. They are joined by an 18 year old Scott, Graham Williamson, who as European junior record holder will go on to challenge for a place in the Olympic team for Moscow 12 months later.

The slowest man in the field (3m57.6s), will sport number 9 on his white Team GB vest and admits in a pre-race interview that as an 800m man the race, "possibly calls for a bit more specialist work than I have been doing". The young man from Sheffield is at best what John Walker refers to in his pre-race comments as, "the question mark of all the athletes". Indeed this young man made an inauspicious start to his BMC racing career when, in his early teens, he was

effectively pulled off the track for 'running too slowly' in the opinion of our founder, Frank Horwill, in an 800m race on a foul night in Barnet Copthall way back in 1971. That's was eight years ago...

Setting the early pace in the Golden Mile is the blond haired and red vested Steve Lacy, who takes the field through the opening 440 yards in 57.8s. After 600m, it's the American record holder Steve Scott, who is placed 2nd. The faithful Lacy reaches the halfway point in 1:55.3 before stepping off onto the infield and allowing the eager Scott to take over. At this stage, the 22 year old Brit wearing number 9 follows him. With 700m remaining, TV commentary notes that a gap between the front two and chasing pack is growing as, "Wessinhage (is) not able to move with them".

From this point onwards Irishman Coghlan will give chase but to no avail. With 500m to go, it's already down to a two horse race between the favoured American and the unfancied Brit who has moved alongside him. The bell is reached in 2m53s as the inexperienced BMC athlete moves past Scott. 300m to go and the young man from Hallamshire Harriers now has 9 yards on the American. As he enters the home straight, a nervous glance over his left shoulder belies the face that the lead has now increased to 15 yards. The commentary team note that there's "a slight grimace but he's so relaxed." As the crowd rises to its feet and heads turn towards the clock in anticipation of something very special, the Loughborough University student takes one more glance over his shoulder and seems to ease down as he crosses the line and raises his right arm in celebration.

He appears unaware that time is frozen at 3:48.95s - a new world record by half a second or so. Even as he is engulfed by a throng of camera clicking reporters he

remains unaware of his feat, as Scott places second and the rest of the field including the now former world record holder Walker trail home in his wake. Half way down the back straight he picks up on the collective roar of the crowd and claps his hands together in excitement as a tidal wave of realisation washes over him.

Exactly 40 years later, Sebastian Newbold Coe still seems in somewhat of a state of shock when reflecting on that warm July evening at the Bislett stadium. With typical candour he stresses that, "I guess the thing that sticks out in my mind about the whole summer of 1979, when I look back 40 years later, was the sheer unexpected nature of it. I had a sketchy training season because I'd got other things going on in my life. I managed to slither my way through my degree at Loughborough University that year".

At this point I remind him that although he may well have been the slowest man on paper for that Golden Mile, that perhaps his billing as a rank outsider was somewhat unjustified given the fact that he had decimated Alberto Juantorena's world 800m record in that very Oslo stadium just 12 days previously. With a grin Seb calls that, "My coach (and father Peter) told me, "Just run as hard as you can for as long as you can. You may not win bit at least you will know what the Delta is and be able to compare yourself with others".

This was a strategy which yielded a mind blowing 1m42.33s as he sliced more than a second off the giant Cuban's ('El Caballo') previous world record. If Coe is understated about this 40 years later its perhaps because a conversation from Norway back home to Sheffield left him feeling firmly grounded on the evening of July 5th. Struggling to contain his laughter, he remembers that, "My abiding memory was having to ring him back in Sheffield because my coach was at



Training in the Sheffield Peak District (1979).

work on the day. I had to get a secretary to pass a message to him. I remember asking her to pass on the message that his son had just broken the World 800m record and she made a note of it and said matter of fact 'Alright then' and abruptly put the phone down without uttering another word!"

Despite his pre-race interview assertions about not being adequately prepared for a Golden Mile, I press him as to whether this 800m gave him the kind of confidence he needed despite his choosing to play his cards close to his proverbial chest. One senses that his sentiments back on 5th July were indeed sincere as he tells that, "After the 800m world record, I got asked by the meeting promoters if I'd come back and run the Golden Mile which of course was again at Oslo. I have to say that this world record was even more surprising than the 800m record. I remember thinking to myself 'Will I have enough petrol in the tank?' Brendan Foster had thrown me in deep back in 1976 I think it was, when I ran a mile at Gateshead. I think I managed to break 4 minutes but in 1979 I didn't consider myself a miler. When I lined up against some of the world's top milers in Eamon Coughlan, Thomas Wessinhage, Steve Scott and Dave Moorcroft, I knew I'd be fine for two laps but after that was unknown territory. After a lap and a half I thought to myself, 'Do I go for home?' I just felt so comfortable. At the same time I had this nagging doubt and voice inside my head saying, 'Now don't get too cocky. I delayed my run for home for longer than I thought. When I went I remember nervously looking over my shoulder at

one point and thinking "Blimey I've got 40 metres on them".

So what of his third and final world record in that amazing 41 days in the summer of 1979? On August 15, organisers of the Weltklasse meeting in the Swiss capital of Zurich unashamedly marketed the event as an overt bash on Tanzanian Filbert Bayi's longstanding record. It was however, forces closer to home that initially appeared to have put the pressure on him to add to his record tally.

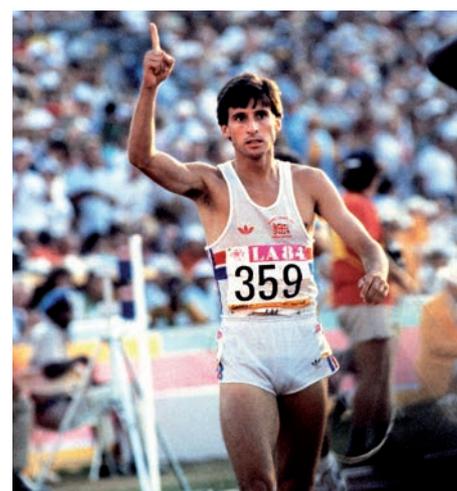
He stresses that, "It was Stan Greenberg and Mel Watman- being the great historians and statisticians of the sport that they were and are. They reminded me that no one in the modern era had ever held 800, 1500m and mile records at the same time- so I had to go for the 1500m record". Was there more pressure on him third time out because it was expected of him, I wonder? With a nod of affirmation he continues that, "Ironically that was the only record I actually prepared for and it was by far the toughest because I had to go out from the gun to get it.

I remember training in the hills up at the Swiss national training centre and being looked after by people like Stefanie Hightower. I didn't do much by way of cooking or cleaning for myself while I was up there! There was definitely more pressure with this last record because the weight of expectation was on me to do it and I think BBC TV cut live into it at one point". Ever the perfectionist he adds ruefully that, "I think if I'd have had pace making I could have run 3m31s or so on that night (rather than

3m32.03s)".

As we say our farewells I remind Seb about our Founder Frank Horwill, accusing him and his competitors of "Crap running" over a loud hailer on that rainy night in Barnet Cophthall in 1971, when he was pulled off the track before the race was restarted at a faster pace!

He laughs once more seeming not to want to take himself too seriously. I shake my head in disbelief that the teenager struggling to break two minutes for 800m has gone on to rewrite the record books and change the course of middle distance history in just 8 years since that teenage humiliation. It's a long journey from Barnet Cophthall to Bislett and perhaps an even longer one to the hallowed offices of the IAAF in Monaco- but if Lord Coe can do it, why can't you try?



LA 1984: The famous signal to the press following Coe's second 1500m Gold.

Coe retains his 1500m Olympic title in a new Olympic Record of 3:32.53 with Steve Cram taking the Silver medal.

MARK SHEARMAN



Winter is where it all starts

The winter season for endurance athletes is a crucial period in the development of training towards summer goals writes David Lowes

The winter is the start of a phase of training and racing over varying surfaces and distances with the major races commencing in January through to March. Others may treat the winter as the start to the following summer season with the main aim being to work mainly on current strengths and build upon weaknesses both physically and mentally.

Taking a closer look at how the endurance athlete can maximise their winter work to pay the greatest dividends can be categorised as follows:

- Good at cross country, but poor on the track
- Uses cross country as strength work for the track
- Uses cross country as a preparatory phase for the indoor season
- Doesn't compete at all, but does higher volume work with the summer in mind
- Doesn't compete initially, but targets the indoor season with extra mileage as preparation for the outdoor season
- Some are unique, although not rare, in that they are equally good on all surfaces

The winter allows the athlete to readjust their training so that come the spring they are in a position to test their improved fitness levels in competition, but only if they have a plan that is specific with targets in mind.

There are many traditionalists who think that cross country should be run over ankle deep mud with much uphill and downhill terrain and that you cannot be successful without it. Rubbish! It's what you do on the training ground that matters. The winter is a break from track running and encourages endurance gains as opposed to speed development, though those that neglect speed in this period will do so to their detriment.

The winter is certainly not a rest period. It is a long structured phase which will hopefully lead to excellence in the short, but intense summer months. What is needed for success in the track season is a winter that has few interruptions through injury or illness. During this period strength will have been improved along with aerobic capacity. Nevertheless, don't panic if the plan doesn't run smoothly, there are always ways and means of getting things back on track.

Many cross country champions are naturally gifted and can run equally as well over any underfoot conditions. There are some however, who are mediocre on the track but almost unbeatable over their chosen surface. Numerous cross country specialists will do some of their quality sessions on their racing surface and the more astute will do their specific sessions on the type of going that their next major race will be run over.

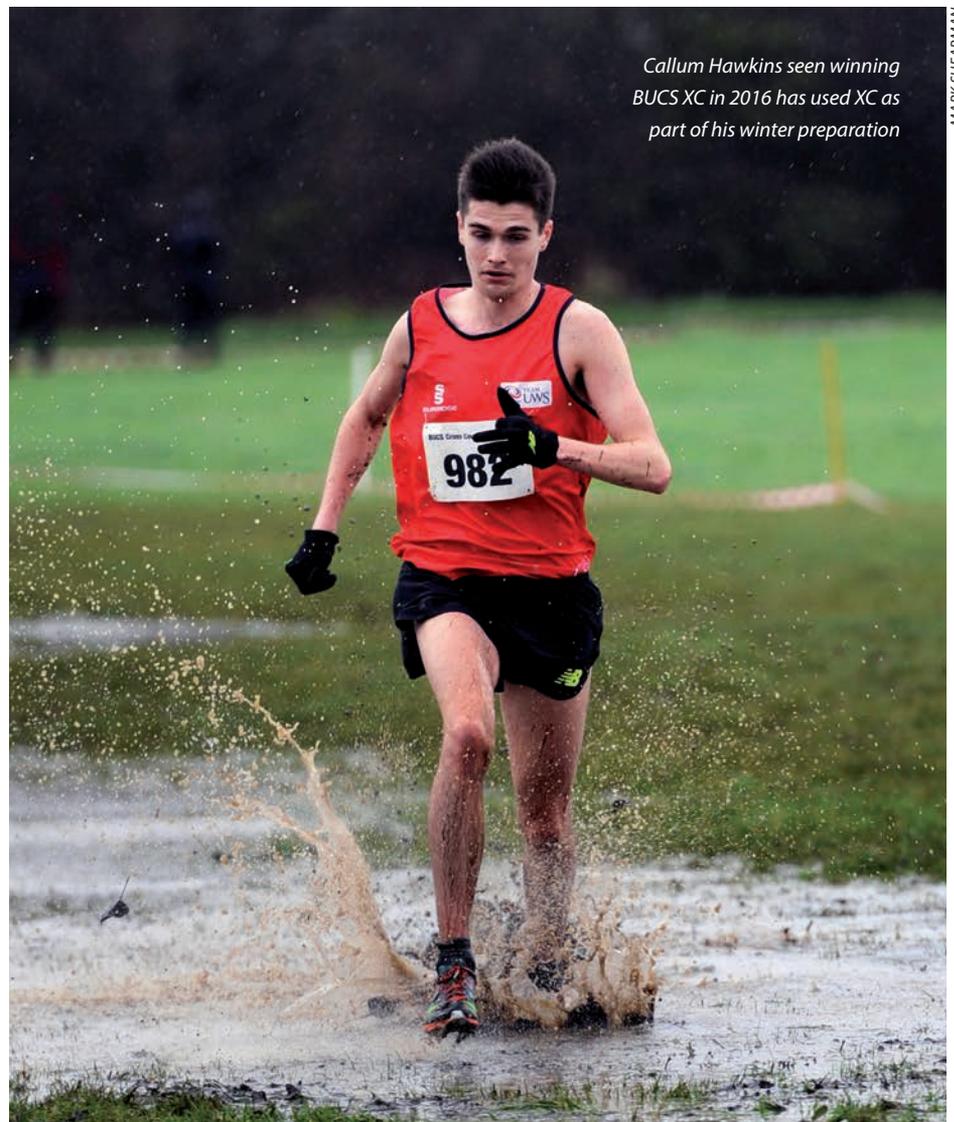
The cross country athlete needs to be very versatile, being able to run equally well on bone-dry flat courses, hilly courses and also stamina sapping mud baths and sometimes a mixture of all of those. Some of these courses will be short laps with many tight turns and most will have an open inviting start which will mean starting at break-neck speed. Cross country is certainly not even-paced running with uphills, mud, tight turns and down hills meaning a vast difference in pace.

WINTER BASE PERIOD

If the winter is the start of the preparation for the summer, then many imponderables have to be addressed before embarking on 7-8 months of endeavour. Some of these are what targets have been met, exceeded or not met at all and the reasons why these have happened and more importantly how any malaises can be improved. Perhaps more relevant is what are the targets that are currently being pursued. If the summer season has been a success, does the athlete/coach try to replicate the type of work that has been done or try something slightly or even totally different?

The winter is without doubt the start for whatever facet of running you choose, cross country, road running, indoors or the ultimate outdoor summer season.

Over the winter months heavy work can be undertaken in colder and wetter weather and the distribution of the work can go awry



Callum Hawkins seen winning BUCS XC in 2016 has used XC as part of his winter preparation

MARK SHEARMAN

if not planned carefully. At the start of the winter work in September/October athletes can be very enthusiastic and keen to train hard, however this eagerness can diminish quickly as the enthusiasm wears off through session boredom, fatigue and the longevity of the season.

The hard work completed in the winter months can be wasted in the summer if the transition from one season to another is not done correctly and let's be totally honest here, the UK traditional annual fixture list doesn't help one jot. The commencement of either season can see some good early performances and this is down to being too eager without a lot of thought about peaking later on. Even though the track season is comparatively short, form can be lost very quickly through a lack of application, both physically and mentally.

More athletes get disillusioned quickly in the summer season than in the long winter months through tougher, more intense sessions which lead to higher levels of fatigue. Some of these sessions include increased aerobic and anaerobic work which is not only faster but with much shorter recoveries and all are usually against the stopwatch. If targets are not met then confidence levels can drop dramatically and if competition outcomes are poor, many inappropriate thoughts can occur leading to total apathy and disillusionment.

Indoor competitions allow a three to four month preparation period before competing in January and February albeit with more volume being done than in the summer.

For realistic targets to be met some solid criteria needs to be set before training begins at the start of a new season and some of these are:

- What things have I done well?
- What things have I not done well?
- Which things were satisfactory, but can be improved?

For speed to improve, short sprint work has to be done regularly, especially if generic make-up is more pertaining to 'slow-twitch' fibres. No medals are given for triple digits in the training diary at the end of the week if you can't sprint when under duress.

Endurance athletes are reticent to change and yet it is one of the most neglected, but beneficial ways of improving a performance in competition. Most athletes tend to think about speed in terms of the summer months, but why take months to get it and then put it on hold throughout the winter? If you want to improve speed you need to develop it in the winter months. This may not necessarily mean running fast all of the time and may require the enhancement of other things which can improve speed

Hawkins en-route to 4th place in the World Champs marathon.



such as: improving running style and thus efficiency, strengthening of physical deficiencies such as quads, hamstrings, calf muscles, core strength, flexibility and mobility and drills, circuits, weights and box jumps can address these weaknesses.

Weather conditions must be reasonable to deliver quality sessions, but the athlete can't keep putting off doing sessions if the weather is poor and it is a fact that many athletes thrive because of occasional adverse circumstances. Not many things are certain in running, but for those doing an indoor season two things are written in stone – it will be warm and windless. Shangri-La!

Speed in the winter can be added as 'bolt-ons' to a main session, such as 6x1000m at 3k pace off a short recovery with a 400m at max effort at the end. Okay, it's not technically speed, but it does help enormously in implementing speed ingredients and rhythm that the athlete needs to find. When it comes to pure speed, the best way to get leg turn-over built up is to do some 'flying 40m sprints' at the end of a session which fires up the fast-twitch fibres (6-12 reps with a walk-back recovery). This speed is something that you never attain in a race, but if you can do these regularly, when it comes to the slower rep work, these can be handled with increasing ease. It's also worth remembering that hill work,

depending on the length, is in actual fact speed work, only against a resistance.

Those running an indoor season need to implement speed elements at an earlier stage in the winter, along with the heavy endurance work. Levels of speed work will be different for specific events and 800m will be much more speed oriented than for 3000m. Once the indoor season is over it is imperative to go back to early winter endurance work before embarking on the pre-summer work to reinforce the elements needed for a specific event.

As the spring approaches it is then that the specific training begins and with the improvements gained through the cold winter months it is expressed in better sessions which are faster, better in quality through shorter recoveries and even more repetitions.

The winter can be viewed as a development phase while the spring is the time for preparation with the summer being where all the specificity is put together for the delivery of peak performances.

Don't be fooled, winter training doesn't necessarily mean cross country running, but it is undoubtedly the foundation work for summer targets.

David Lowes is BMC academy chair, event organiser and secretary as well as a freelance level 4 coach, athletics writer and photographer

Training Adaptations Over Time & The Fuel For Running

By Charles McConnell

The 'Big Three' of endurance are Maximal VO₂, Lactate Threshold (Tempo/ OBLA) and Efficiency. VO₂ Max is all about how much oxygen can be delivered and used by the body's muscles. Dramatic increases in VO₂ Max in individuals who have never been active, can be seen after just one week of training, even if only running at 50% of max. This factor is primarily about the delivery of oxygen. A higher VO₂ Max increases the potential for more and better use of oxygen by the body's muscles. It is limited by the maximum pumping capacity of the heart-stroke rate + stroke volume. Of these, any improvement is down to a bigger stroke volume (due to an improvement in blood volume) rather than stroke rate.

After six months of training, any gains begin to taper quite markedly, with a possible initial improvement of upto 20%. As well as gains in an individual's absolute VO₂, there may be also higher figures in relative VO₂ Max. Thus an example of runner X who starts at 3.0 litres/min and weighs 78kg (3000/ 78 = 38.5ml/min/kg) could improve to 3.5 at 74kg = 47 ml/min/kg (with a slight drop in weight due to any initial training). Continued running with more intensity could mean X would top out at 4.0 @ 72kg (56) as the slight drop in weight helps improve the relative VO₂Max score. Individuals who start at a higher VO₂ Max will see a much less startling relative rate of improvement. Depending on the time of year, the training being undertaken and whether peaking for a target race, VO₂ Max can fluctuate widely with the interplay of volume and intensity. With more years of training the VO₂ Max may not improve- indeed, it may worsen due to age factors, however performance results may still continue to improve as the impact of the other factors kick in (see later).

Lactate Threshold (Tempo/ OBLA)

Lactate threshold is all about the utilization of oxygen. What you are trying to do is get used to running faster without accumulating the acidity build up associated with lactic acid. It is limited by the capillary density, enzyme levels and the mitochondrial density in the muscles which are powering movement. **VO₂ Max + Lactate Threshold together is your 'engine of performance'**-

its sustainable power.

Whilst the cardiovascular adaptations- both central and peripheral- were helping X improve his VO₂ Max, there were major changes happening in the muscles of his legs. These local muscular adaptations include: - more mitochondria, more enzymes to help with metabolising fatty acid metabolism, and an increase in the number of capillaries surrounding muscle fibres. Together, these mean that X's leg muscles use less fat and glycogen at any given running pace. In addition, the glycogen is more likely to be completely oxidised metabolically rather than -when he started running- metabolized to lactic acid. Thus after six months, X now has not only a higher VO₂ Max, his lactate threshold may have improved by 10%. It gets better as these gains are even greater as they are now relative to a higher maximum. Original threshold for sustained running was at 57% of 3.0 (1.71 l/min), and the new sustainable result is 65% of 4.0 (2.6 l/min)- an improvement of 30%. It keeps on getting better, for if X continues to raise the intensity of his training, his lactate threshold will continue to improve over many years (unlike VO₂ Max) before it eventually it does level off.

In tempo sessions, you are trying to run at higher % and nudge it down. For example, as a beginner, you are trying to move from a pace of 6.00 per mile for two miles down to 5.40 pace. You cannot go straight to 5.40 pace as 6.00 pace is just on the edge of aerobic and anaerobic running, and as tempo running is on the line between the two systems, it is too big a single move into the anaerobic system (territory) in one go and the athlete would soon wear out. You have to do it in stages- thus to 5.56, then 5.53, to 5.50 over a number of weeks and so on. Years later, when you might be trying to go from 5.00 pace for five miles down to 4.45 pace, the same principle of progression in small stages applies.

Lactate threshold running is an aerobic session (just!). You are trying to teach the aerobic system to take more of the work load. Experiment with a push/ pull approach; where small parts of the run are just faster than the target pace (the pull) whilst other sections are run at just slower than the target (the push). **Tempo runs, done at Lactic Threshold Pace TRAIN THE**



Elliot Giles wins the Trafford GP 800m.

HARRY SHAKESHAFT

AEROBIC SYSTEM. Senior athletes, training for 1500m and longer should consider doing a tempo run - of 5 miles minimum -every two weeks- and ideally over the same course to monitor improvements.

Efficiency

Efficiency in endurance terms refers to getting metabolic work done at a given level. It links the sustainable power of the first two factors to performance velocity. As we have a limited engine, if we can improve how efficiently we are moving, we can continue to improve our performance results. The more efficient, the faster pace we can run at at a given level of energy output. This is more relevant, the more training you do for your event and the longer your event. It is not very relevant for low mileage 800m runners, but it starts to be so for the 1500m and above, and it is increasingly so for 10k and especially marathon specialists. On a treadmill test, a good result will be at 200 and below- the lower the better. However, it does not mean that the most efficient runner will win. The very low scores recorded by Zersenay Tadese have helped in his World half marathon successes, but he has not enjoyed equivalence in major games 10k or marathon races. Efficiency may continue to improve in runners over many years, simply due to the volume of running. This was

also apparent in the classic study on Paula Radcliffe over a period of five years, which is discussed below.

Why is this relevant to my training?

When you start training, your results will probably improve quite dramatically even if you just run slowly. All three of these ingredients will vary as you intensify your training to a peak, recover from an injury or start a new season of increasing volume and/ or intensity. However, if you have been training for a few years, you might like to consider the time spent trying to increase VO2 Max when it is already at a very high level and unlikely to go much or any higher. Perhaps a change in training emphasis to a focus on lactate threshold and efficiency will be more productive, simply due to their longer timeframe of producing gains.

The relative importance of VO2 Max / Tempo running and efficiency is considered below. I have compiled a table from the five year study by Jones of Paula Radcliffe (and Power of 10) which shows the effect of changes in a number of variables between the years of 1991 and 1995. In 1991 Radcliffe was 17 and thus 21 in 1995. She was World Junior XC winner in Boston in 1992 and I watched her compete in the World Championships in Stuttgart in 1993, where she finished 7th.

*By 1995 she was focused on the 5000 as the IAAF were on their way to deciding that women were no longer weak and feeble females and the 5K had replaced the 3K. In 1991 she was 1.68m tall (BMI 18.2); by 1995 she was 1.74m tall (BMI 17.3). Note she did not stop growing at 16! Body fat remained healthy- never under the critical 10% figure. After her first five years of training, her VO2 Max score was already 72.8.

Between 1991 and 1993, her 3k time improved by 43 seconds whilst her VO2 Max fell from 72.8 to 66- indicative of what has previously been noted about the relative

importance of using VO2 Max as an indicator of performance. Over the five years, (1) shows that lactate threshold improved 20% (15- 18), whilst (6) shows an 11% reduction in the VO2 to run at 16 km/h -indicating a much improved running economy. This improved running economy helps offset the drop in VO2 Max. (7) Estimated running speed at VO2 Max was better and more accurate predictor of 3k performance. Treadmill tests can be informative, but athletes might be better advised in developing the older skills in judging efforts and paces- by becoming experts in listening to their own bodies and not placing too much over reliance on some technologies.

One final point: the fuel for running depends on the interplay of duration and intensity. The three energy pathways are; ATP-PCr, Glycolytic/ Lactic Acid and the Aerobic/ Oxydative systems. For fast sprinting, the energy is supplied initially by the ATP stored in your muscles and

then later up to 22 seconds work by ATP + CP. For extended sprinting up to c45 seconds the energy is supplied by ATP + CP and muscle glycogen. Beyond that and the move into the energy for endurance racing and training, it is the combination of muscle glycogen, lactic acid and fatty acids. The really important thing to note is that: **Lactates Are Not A Foe- They Are A Fuel.** The bad boys are the hydrogen ions which poison the system. Lactates have a bad reputation, perhaps inevitably when TV commentators describe an athlete finishing a race 'as swimming in a sea of lactic acid'. However, lactates are simply a fuel and not your foe: you should learn to use them and not fear them. They are there to help you.

With thanks to Stephen Seiler

References

Jones A (1998) A Five Year Physiological Case Study Of An Olympic Runner, British Journal of Sports Medicine, 32 pp39-43



Doha 1500m finalists:
Gourley (3:37.30)
Wightman (3:31.87)
Kerr (3:32.52).

MARK SHEARMAN

		1991	1992	1993	1994	1995
1	Lactate Threshold (km/h)	15.0	16.5	17.0	18.0	18.0
2	Lactate at 17 km/h	3.7	2.8	1.6	1.6	1.4
3	Maximum Speed (km/h)	19.5	21	22.5	22	22
4	3k time (Power of 10)	9.23.39	8.51.78	8.40.40	Injured	8.40.82*
5	VO2 Max (ml/kg/min)	72.8	68.5	66.0	67.0	66.7
6	Oxygen cost of submaximal running at 16 km/h + 1% treadmill grade	lactate threshold was lower than 16 km/h	53.0	51.0	50.6	47.6
7	Speed at VO2 Max	19.0	19.5	20.0	20.3	20.4
8	Body Mass (kg)	51.3	52.2	53.0	54.4	52.5
9	Body fat (%)	15.7	13.4	11.8	15.7	14.1

Analysing training schedules for coach learning

By Charles McConnell

Training schedules are one part of coach learning that a motivated coach can seek out in their attempt to become a better, more informed coach. The problem in studying them lies in appreciating what is important or not and also what is included or excluded. In this study, which focuses on Bob Kennedy, the training runs have been excluded to save space. The average for these weeks is 68 miles per week; not excessive- and certainly within the mileage that most serious endurance athletes would be able to achieve. Was this a year round pattern, or does it just show a smaller summer average which differs from the winter training? There was no indication of the pace of these runs. Were the steady runs at 6.00 or 5.00 minute miling? The figures in brackets show the weekly total mileage. Within this period, two single runs of 11 & 13 mile runs were the only two runs over 10 miles - the next longest was 8.5 miles and the most frequent were runs of 5 miles.

Even though he often trained twice a day, he did not exceed 12 miles a day: often running just 2 x 5, or a 5 and 3 miles with some strides or some other combination on those days when sessions were not done. The first most important lesson to take away is that examples of training very rarely give a complete picture of what an athlete does for the entire year leading up to a major games. Mostly you get little snapshots. There are a number of year long and even longer than one year examples, but you have to look very hard to find some of them.

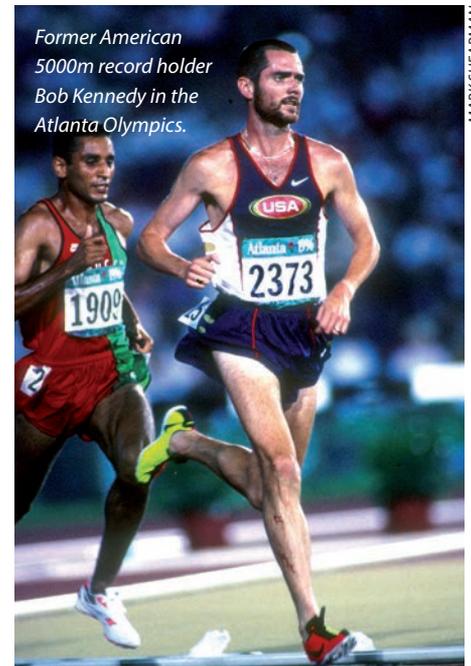
In the table below, are the most important sessions in the last nine weeks of Bob Kennedy's training leading up to the Atlanta Olympics where he finished 6th in 13.12.35. It covers only a short period of time, leading up to a season peak- how representative is this of his training throughout the year? So the lesson to be taken from this refers to training and racing toward a summer peak. It tells you nothing about what he was doing in the nine months prior to June 4th. It tells you nothing about how fast he was running the runs and very little about what else he was doing- weights, core, circuit training etc, although he does record taking an ice bath plus a light massage after the first two rounds before the 5K final in Atlanta. There

is no information about his many years of progressive training before this snapshot is presented.

He seems to have done only 1500m and 5K sessions. There would seem to be a clear pattern of using only reps of 200s and 400s for 1500m sessions -often in sets and rarely run straight through. Is this pattern only done in the summer when aiming for a summer peak or does the winter include building up to 12/ 16/ 20 x 400 - with the 400s being run slightly slower -with no sets, which then develops into a more demanding summer session done faster and in sets? He often ran three sessions a week, but as they were not all very hard or even hard sessions, his residual tiredness did not build up. How hard should your hard sessions be, and how many hard sessions should you do each week? There is much more variation with the 5K sessions, but first, let's look at the 1500m sessions.

A number of the sessions are not particularly taxing: the regular 200 metre sessions seem doable (one thing to bear in mind is -is the information clear? On June 16th does the 75 figure represent the recovery after each run - which I think it does (did he jog 200 for the recovery?) or is it 75 seconds run and recovery with 2.45 between sets? The June 10th 3 x 4 x 400 with 60 seconds between runs and 3 minutes between sets should not frighten good athletes. Note how it is slightly changed on June 24th and then later on July 17th in the final two week peak. Also note how it is changed on July 5 th as a peaking session for the American 5K record attempt. Also note on July 26/28th, how the interplay between volume and intensity is reduced in the period leading up to the peak.

As the 400 sessions would seem to be aimed at 1500m pace (with the 200 sessions slightly faster) - this makes the slightly slower 5k pace sessions feel easier due to regular runs at faster than 5k pace. The pace for the 1500m sessions do not seem to alter very much: they do not get increasingly faster. It is important to remember that for Harry Wilson, simply running sessions faster was not always the best way to recognise improvement. Sometimes, just running at the pace of a previous session but being more relaxed and working less hard doing the same work was



more important and also a good indicator of progress. You do not have to hammer each session. If your aim is to run at c58 pace for 400m, why not run that and not at 55 pace? You can alter the impact of a session by changing the recovery as well as by the speed of the effort.

As for running at 5K pace, note that he ran 3 preliminary races, an American record and two finals in nine weeks: the first to guarantee selection and then the Olympic final for a total of 6 races at that distance. As well as these, he did 6 sessions focusing on aspects of the 5K. Note the subtle changes. Unlike the 1500m sessions, many of these 5K sessions would defeat all but the best athletes.

June 4th - a pyramid focusing on quality work -4600m volume.

June 8th- 3 x 1600m with the lap times probably targeted beforehand. This is a brutal session, with wild changes of pace to practise any similar possibilities in a race. It is unwise to do anything untried in a race as you do not know how you are going to react to something you have never faced before. You should have used your training sessions well and often, to mimic what could happen. Recovery was 3 minutes- not the 15 minutes of Steve Prefontaine in 1972 -4800m volume.

June 13th- a mini sharpener session for the American Trials -2200m volume.

July 2nd- 3x (1200/ 400 (Rec 60/ 4)). This was 6 days before the attempt on the American record and is another brutal session of a rep at 5K pace -followed by a short recovery and then a 400 at 1500m pace with a longer recovery. This is a peaking session -4800m volume.

July 15th- a straightforward (?) 5 x K session at 13.00 pace- run very fast with each effort getting faster as practice for a Championship race- but note the recovery is now down to 2 minutes. Anybody fancy trying to run those times with that recovery? July 23rd - downward pyramid, again getting faster in the peaking phase- 4000m volume

Note that he seems to have been out of America for 4 weeks until July 18th. Did

this help to avoid attention and pressure for a home games? In this period, he did race over 1500m as a sharpener and almost certainly he was able to put into practice what he had learned from previous seasons, including when to schedule very hard sessions and also how much recovery he needed between major races and sessions. The reduction in quality sessions volume would seem to have started on July 21st - with 10 days before the 5K first round, but overall training volume remained consistent in the mid to high 60 miles per week.

Training schedules from the best athletes are a useful tool for coach and athlete to learn about what these athletes are doing. However, it is important to remember that

they are often incomplete and only provide a limited snapshot, and even an idealised version of what training they have been doing. Do not copy what Olympic athletes are doing- they are outliers. Any examples of what full time athletes with 16 hours of the day to train in multiple sessions, as well as do the other support work and also have the ability and time for mid day naps for recovery are not to be copied indiscriminately if you only have two hours to spare after a full working day. Rather, try and understand what they are trying to achieve in their sessions, and understand what are the most important lessons for you and why, and then adapt it to your circumstances.

Bob Kennedy 1996 Training: Key Sessions & Races Prior to Atlanta Olympics (from a post in LR.Com)

June 4 am 3 wu: 400m-59.8 (60), 600m-90.2 (90), 800m- 2:02.3(2), 1000m- 2:36.6 (2:30), 800m- 2:04.6 (2), 600m- 1:31.1 (90), 400m- 60.3 - 2 wd pm- 4 miles	June 11 am 4 pm 3 wu4*400m (:58.1, :57.5, :58.5, :57.8) (:60) (3:00) 4*400m (:57.2, :58.2, :57.6, :58.1) (:60) (3:00) 4*400m (58.0, 57.5, 57.2, 57.2) (60) 2 wd
June 6 am 3 wu 4*200m (28.1, 27.7, 27.4, 26.6) (80/3) 4*200m (28.1, 27.4, 27.4, 26.7) (80/3) 4*200m (27.6, 27.2, 27.6, 26.8) (:75) - 1.5 miles wd pm - 4 miles	June 13 am 5 pm- 3 mile wu 1000m (2:27.6) (2:30) 600m (1:26.2) (2:00) 400m (:56.1) (:90) 200m (:26.8) - 1.5 mile cool down
June 8 am 3 miles pm- 3 wu 1600m (58, 63, 60, 66) – 4:07.2 (3:00) 1600m (:64, :59, :67, :60) – 4:10.6 (3:00) 1600m (:60, :66, :60, :67) – 4:13.6 - 2 mile wd (75)	June 16 am 3 mile warm-up 4*200m (:28.8, :28.2, :28.1, :28.1) (:75) (2:45) 4*200m (28.3, 28.8, 27.9, 27.7) (75) - 2 mile wd (67)
June 19 Week of the Olympic Trials. am- 3 miles OT (semi) 3 wu 5000m- 13:58.8 – (3600m-4200m, 1:31) 3 mile cool down, strides	June 24 Week after the Olympic Trials. am- 3 wu 5*400 (59.0, 58.3, 58.8, 58.8, 59.3) (55/ 4) 5*400 (:59.6, 58.5, 59.9, 58.5, 57.4) (60) 2.5 mile wd
June 21 am 2 miles Olympic Trials (Final) 3 mile warm-up 5000m – 13:46.1 – 1st Place 4 mile cool down, 3rd K (2:35), last 3K (8:05)-fartlek (60)	June 25 am Travel to London pm- 7 miles June 28: am- 3 wu 8*200m (28.9, 28.2, 28.4, 28.0, 28.6, 27.7, 27.7, 27.8) (75) 2 mile wd pm- 5 miles June 30 am 2 miles Gateshead, 3 mile warm-up 1500m – 3:40.97 – 1st Place- 2 mile cool down (64)
July 2 Week to Am Rec. am- 3 wu. pm- 3 wu 1200m (3:05.1) (60) 400m (58.5) (4) 1200m (3:00.8)(60) 400m (58.2) (4) 1200m (2:59.1) (60) 400m (57.5) - 2 mile wd	July 15am Track, 3 mile warm-up 5*1000m (2:32.7, 2:32.4, 2:31.7, 2:31.5, 2:30.5) (2) 3 mile cool down pm - 5 miles
July 5 am 3 miles pm- Track, 3 miles warm-up 4*400m (:59.6, :61.5, :60.0, :58.0)(60) (2:30) 4*200m (:29.7, 28.5, :28.5, 28.1)(70) 1.5 mile wd (64)	July 17 am 3 wu 4*400m (59.6, 59.2, 58.1, 59.7) (55/ 3) 4*400m (59.6, 59.4, 59.1, 58.1) (55/ 3) 4*400m (59.0, 58.8, :59.5, 58.1)(:55) - 2 mile wd pm: 5 miles
July 8 Stockholm 2 weeks to OG am- 2 pm- 3 w u, 5000m -12:58.75 -2nd+AR- (2:37, 5:10 (2:33), 7:47(2:37), 10:24(2:37), 12:58(2:34) 1 wd, strides	July 21: am- 3 wu 4*400m (62.7, 59.9, 60.1, 59.1) (55/ 2:30) 4*400m (61.5, 59.9, 59.8, 58.5) (55) - 1 wd pm- 5 miles (68)
July 23 One week to OG am 3 wu 1600m (4:06.6) (4) 1200m (3:02.8) (4) 800m (1:58.9) (4) 400m (55.4) - 3 mile wd pm- 5 miles	July 31 . am- 1.5 miles pm- Olympic Games Heats 2.5 mile warm-up, 5000m – 13:54.57 – 4th -1 mile wd, ice bath, light massage
July 26 am 3 wu 3*400m (:59.7, :60.0, :59.4)(:90) 3*300m (:42.9, :43.2, :43.2)(:70) (3:00) 3*200m (:27.4, :28.0, :27.0)(:70) - 2 wd pm- 3 miles	August 1 am 1.5 miles pm- Olympic Games (Semi) 2.5 mile wu, 5000m – 13:27.9 – 4th 1 wd, ice bath, light massage August 2: 3 miles, strides
July 28 pm 2.5 mile warm-up 4*200 (:28.5, :28.0, :27.8, :27.5)(:65) (2:45) 4*200 (:28.7, :27.6, :28.7, :27.2)(:65) - 1.5 mile wd (66)	August 3 am 1.5 miles pm- Olympic Games (Final) 2.5 warm-up, 5000m – 13:12.35 – 6th Place 1 mile cool down (43 in 6 days)

Training For Middle/Long Distance Running Events

By Charles McConnell

FUELS FOR RUNNING

Food (Carbohydrates/CHO, fats and protein) converted to ATP provides energy for muscular contraction, and therefore exercise. The body has a small store of Creatine Phosphate – high ATP power (36 kcal /minute) – very short capacity for energy provision. The main sources of energy are:

CHO -stores of c90 mins - relatively fast, high ATP power-16 kcal per minute /low ATP capacity; Fats -relatively inexhaustible stores – slower (triglyceride must be converted to the more user friendly glycerol and FFA), with low ATP power/high ATP capacity.

THREE ENERGY SYSTEMS

Exercise intensity / event duration determines which of three energy systems producing ATP is used.

ATP-PCr System

ATP and creatine phosphate (making up the ATP-PCr system) operates with/without

oxygen. It doesn't need oxygen - thus said to be anaerobic. Maximally ATP lasts for c6 seconds -with a less extravagant acceleration, up to 22 seconds. Beyond this the body relies on;

The Glycolytic/ Lactic Acid System

Carbohydrates are stored as glycogen in the muscles or liver for later use. The end product of glycolysis is pyruvic acid. Depending on the event demands, it is broken down quickly – end product lactic acid with the negative impact of accompanying hydrogen ions, or slowly – end product pyruvate. Beyond 45 seconds fast running, there is a growing reliance on;

The Aerobic/Oxidative System

This produces ATP through FFAs or carbohydrate (glucose); however FFAs require more oxygen for their combustion. Running for 1 hour expends c750kcal. The body has a stored energy capacity of at least c100,000 kcal. Fats can only sustain running speeds upto 60% VO2 max, beyond that CHO is the preferred fuel for MD/LD running.

Initially aerobic but beyond c85% VO2 max there is an increasing contribution from anaerobic glycolysis.

The oxidative system is used primarily during rest /low-intensity exercise. It takes c90 seconds to produce its maximal power output; -training helps make this transition earlier (see VO2 Kinetics). The energy systems do not work sequentially – ALL contribute ALL the time. The primary two factors affecting energy systems are: intensity /duration of exercise.

ENERGY PRODUCTION IN MD EVENTS

The FASTER the running speed, the faster the RATE at which ATP must be broken down and regenerated in the muscle cell. In sub-max running ATP is regenerated almost entirely from aerobic metabolism. Racing above VO2Max (critical speed), ATP turnover rate continues to increase-however VO2 levels off. To meet these super max demands, anaerobic metabolism contribution increases. The difference between total oxygen demand - total oxygen supply represents the anaerobic contribution to energy production. Energy produced in a race equals the sum of a runner's anaerobic capacity + the energy they can produce aerobically in a race.

Limits to Energy Production

Anaerobic energy production is limited by the total AMOUNT of energy a runner can generate to an anaerobic capacity; it should be spread over race duration and exhausted when finishing.

There is a finite anaerobic capacity.

Aerobic energy is limited by the RATE at which energy can be generated -theoretically, there is no limit to the total AMOUNT of energy generated aerobically –body fat stores /oxygen are abundantly available but the RATE of aerobic energy production is strictly limited by the max rate runners use oxygen- VO2max.

THE DETERMINANTS OF MD PERFORMANCE

Total energy for a race = sum of energy required to accelerate up to race pace +energy required to sustain this pace for

A. TRAINING TO IMPROVE RUNNING ECONOMY					
Event	Intensity	Duration (mins)	Reps	Rest	Sessions per week
800/1500m	Race Pace	1 - 3	5 – 10	Full	1 – 3
3/5/10k	Race Pace	5 - 30	1 - 5	Full	1 – 3
21.1/42.2	Race Pace	30 - 120			1 - 3

Fallowfield p84

B. PERCENTAGE IMPROVEMENTS TO RACING PERFORMANCE FOLLOWING 10% IMPROVEMENTS TO A VARIETY OF PHYSIOLOGICAL DETERMINANTS					
Distance (metres)	VO2max	VO2 Kinetics	Anaerobic Capacity	Running Economy	% VO2max Sustained
400	3.2	1.0	4.3	6.2	
800	4.2	0.9	3.0	6.5	
1500	5.3	0.8	1.8	6.7	
3000	6.0	0.7	1.0	6.8	
5000	7.3	0.4	0.5	7.5	2.3
10000	7.5			7.5	6.7
21.1	7.8			7.5	7.8
42.2	8.0			7.5	8.0

Fallowfield p35/58

race duration. Anything affecting the body's ability to supply the energy demanded by working muscles is a determinant.

Determinants of Energy Supply

Max amount of energy generated *anaerobically* is limited by the runner's anaerobic capacity. Increasing this capacity improves MD performance.

Max amount generated *aerobically* depends on VO2 kinetics + VO2max (1500m & longer). 800m runners only reach 94% VO2max - therefore their limit is %VO2max attained by race end.

Determinants of Energy Demand- if these can be reduced, performance will improve.

-Overcoming air resistance- any running speeds over 13 km/hr impacts significantly on total oxygen cost of running (@ c8 minute miling) -therefore on tactics.

-Running Economy & the slope of the running speed- but it is **running economy at race speeds** which determine MD performance. The comparative slopes for any two athletes may vary from shallow, parallel to steep for a range of distances – see Fallowfield p57 for explanatory graph.

Guidelines to Improve Running Economy

Faster/ more successful runners tend to have better running economies than slower individuals who may have relatively limited scope for improvement. (See Table A.)

Impact of changes in physiological

determinants of running performance, thus when training for MD/LD events, it is advised to concentrate on the most productive sessions. (See Table B.)

TRAINING FOR MD/LD RUNNING

Keypoint: whilst all races of 5k and longer are run at less than VO2max, athletes must prepare for the anaerobic demands of surges /fast finishes. Distances of 8/15/3k are to an increasing degree, aerobic and endurance based, in which the demand for oxygen exceeds the body's ability to supply it aerobically. Therefore large amounts of anaerobic energy must be generated for these events and QUICKLY. This is extremely wasteful - it cannot continue for long. MD events are a mix of aerobic /anaerobic energy

THE CONTRIBUTION OF AEROBIC /ANAEROBIC METABOLISM TO ENERGY PRODUCTION

C. AEROBIC /ANAEROBIC CONTRIBUTION TO ENERGY PRODUCTION FOR RACE DISTANCES

Race distance (m) & Duration (mins)	VO2 Demand (ml kg-1 min-1)	O2 Uptake required for acceleration (ml kg-1)	Total O2 Demand (ml kg-1)	Total O2 Supply (ml kg-1)	O2 Equivalent of Anaerobic Energy Prod'n (ml kg-1)	%Contribution From Aerobic - Anaerobic Metabolism
400 0.51	108.9	5.9	99	43	56	43 57
800 1.52	96.3	4.9	185	111	74	60 40
1500 3.51	85.1	4.0	332	254	78	77 23
3000 8.15	77.8	3.5	645	570	75	88 12
5000 13.57	75.0	3.4	1049	987	62	94.1 5.9
10000 29.16	70.7	3.1	2072	2010	62	97 3.0
21.1 65.56	65.3	2.7	4308	4255	53	98.8 1.2
42.2 141.30	60.0	2.4	8492	8452	40	99.5 0.5

Fallowfield p21/47

Findings from other authors:

D. % ENERGY CONTRIBUTION

Event	%VO2max	Description	Phosphate	Anaerobic	Aerobic	
400				70	30	Maughan (2000)
800				40	60	
1500				20	80	
5000				5	95	
10000				3	97	
Mar				1	99	
400				68	+/-6 32	Hill (1995)
800				42	+/-5 58	
1500				20	+/-4 80	
400		All out, long speed	10	60	30	Martin (1997)
800	135	95-100% End Speed	5	38	57	
1500	112	95% Speed Endurance	2	22	76	
3000	102	90% End with Speed	<1	12	88	
5000	97	85% Endurance Speed	<1	7	93	
10000	92	Long End + some Speed	<1	3	97	
Marathon	82	Paced Aerobic, Long End, Possibly Speed	<1	<1	99	

production. An appreciation of the interplay of power /capacity is vital in determining training programmes. Training adaptations are achieved by overloading the physiological systems which limit performance re frequency, intensity and duration (FID).

Training can be based on a) individual heart rate response or b) racing paces.

KEY POINTS:

Build training programme around two very high intensity training / intervals per week (these stress CV system thus increasing / maintaining a high max oxygen consumption). They also stress lactate clearance and buffering systems but not muscular adaptations such as mitochondrial proliferation and increased capillary density.

Most training should be at a LOW intensity of 60–75% max HR (Lactates of 2.5mM and

below).

Avoid medium intensity runs; EASY runs must be EASY enough to ensure HARD days are HARD.

Monitoring Training Based on Race Performances

Training speeds can be estimated from personal race performances. See Winter 2017 BMC News pp31-33 for a guide.

E. MONITORING TRAINING VIA HEART RATES				
Zone+ max/ % of week's mileage	Purpose	Intensity %VO2 max %HR max	Varieties	Duration
Easy Run -150 mins/25%	Promote wanted cell changes - Develops CV system	60–74% 65–79%	WU/WD/Recovery Rec run in workout- Long run	10–60 min Several mins To 150 mins
Marathon	Race pace; alternative easy pace for others	75–84% 80–90%	Steady Long repeats	To 90 mins/ 16 mls Marathon runners only
Threshold 60mins/10%	Improve endurance	83–88% 88–92%	Tempo Cruise intervals	20–60 mins To 15 mins (1/5 rec)
Intervals 10k/ 8% max 3x race distance	Stress aerobic power (VO2 max) Stress aerobic system @ race pace	95–100% 98–100% Race pace	VO2 max intervals Race pace intervals	To 5 mins Equal Rec To ¼ race distance Less/equal time for rec
Reps5mls 5%	Improve speed & economy	Mile race pace Fast & controlled (race pace/ faster)	Pace reps/ strides Speed reps & fast strides	To 2mins -full rec

Daniels (2005) p35

F. TRAINING INTENSITY CHART			
Intensity as a % of HRmax	Lactate Concentration	Training Form	Comments
60–70%	1–2.5 mM	LD variable forms	Very important – highest volume total training load
70–80 %		Distance work – uneven conditions	For variety – gives least return for the effort
LOW Intensity Threshold – Lactate Threshold			
80–85%	3–4 mM	Natural intervals	Used in a limited way
85–90%		Medium hard interval / distance training	Very Important
HIGH Intensity Threshold – Lactate Turnpoint			
90–95%	4–8 mM Greater than 8 mM	Hard interval training Tempo Training Tests	Very Important
95–100%		Short (5–10K) Races + Short max sprints	Small percentage total training volume

Seiler

G. EFFECT OF RELATIVE EXERCISE INTENSITY SUSTAINED (%VO2MAX) ON RACE TIMES				
Race Distance (km)	% VO2max Sustained by MD/LD (5-10K)	Theoretical Time Achieved by MD/LD Runners	% VO2max Sustained by Marathon Runners	Theoretical Time Achieved by Marathon Runners
5	98.7	13m 52s	97.2	14m 03s
10	91.4	29m 32s	93.3	29m 02s
21.1	82.7	67m 38s	88.7	63m 51s
42.2	73.9	2h 28m 30s	83.9	2h 13m 41s

Fallowfield p54

H. TRAINING TO IMPROVE VO2 MAX

Mode	Intensity (%VO2max)	Duration (min)	Reps	Rest (min)	Sessions per Week
Continuous	60 – 80	30 – 120			
Intervals	90 - 100	3 - 6	5 - 10	0.5 – 1.5	1 - 4

Fallowfield p78

Relative Exercise Intensity

The relative exercise intensity that can be sustained during LD events is an important determinant of ultimate performance as VO2max and %VO2max sustained interact to determine the effective rate of oxygen uptake that can be sustained for the race duration.

Maximum Oxygen Uptake

The higher a runner's VO2max the higher their peak running speed and the better their endurance performance potential. VO2max is only ONE key physiological factor determining performance. High VO2max shows potential -allows access to the club as an elite MD/LD runner- but results reflect their sustainable VO2 max, running economy and anaerobic capacity where applicable. Some athletes with low VO2 max results have alternative strengths which counter this apparent weakness. VO2 max values for females are c10% lower than for males.

Limitations to Maximum Oxygen Uptake

Training to improve VO2max should target the pumping ability of the heart or max cardiac output –(stroke volume & heart rate). Heart rate is not changed much by training; improvements in VO2max come from an increase in heart size which increases stroke volume. The best way to increase heart volume; high volume training of prolonged, moderate - hard intensity sessions.

Guidelines to Improve Maximum Oxygen Uptake

FID affect improvement rates for runners. Running at 50% of VO2 max, beginning

athletes will improve, whilst the greatest gains for experienced athletes are between 90-100% VO2max.

Anaerobic Energy Production

The methods to produce energy anaerobically are specific to each event. Increasing the RATE (anaerobic power) improves 400m performance – less so for 800m and above- as anaerobic capacity (total amount of energy generated anaerobically) is unlikely to be exhausted in events of less than 60 secs.

Training Guidelines to Improve Anaerobic Energy Production

Anaerobic Power: The rate of anaerobic energy production for MD depends on the rate of energy production from glycolysis and ultimately from the concentration of enzymes that catalyse glycolysis **within the muscle fibre**. Maximal sprinting activates these enzymes and is the stimulus to increase enzymes' activity and thus the rate of glycolysis. 400m runners need to increase their rate of anaerobic energy production by max sprinting of 5-30 secs with 3-5 mins recoveries (less than 5 secs relies on ATP not glycolysis for energy production).

Anaerobic Capacity: The greatest potential for improving a runner's anaerobic capacity lies in enhancing energy production from glycolysis. Energy is produced in the muscles' stores. During fast runs, lactates and hydrogen ions are produced –the latter inhibiting energy metabolism. The limitation to anaerobic energy production is muscles' ability to buffer the hydrogen ions associated with lactate formation. Training to improve anaerobic capacity should be max/ near max

to overload processes involved in glycolysis and subsequent management of lactate and hydrogen ions. The rest periods should not be long enough for full recovery; therefore the training stimulus on muscle buffering capacity will be maintained. Runners can have good 400m speed but not be suited to 800m running as their anaerobic capacity is limited; they should explore longer distances and develop any speed abilities to improve their finishing options and thus future success.

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DAVID LOWES

I. TRAINING TO IMPROVE ANAEROBIC POWER

Event	Intensity	Duration (s)	Reps	Rest (mins)	Sessions per Week
Middle Distance	Maximal	5 - 30	3 - 10	2 – 5 Full Recovery	2 - 4

Fallowfield p86

J. TRAINING TO IMPROVE ANAEROBIC CAPACITY

Event	Intensity	Duration (secs)	Reps	Rest (min)
MD	Maximal	20–45	3 – 10	1 – 2
	Near maximal	45–120	2 – 8	3 – 8
	High @ >= 10k pace	300	6 - 8	1

Fallowfield p88

British 800 metre Standards



Shelayna Oskan Clarke wins the 2019 British Champs 800m. Lynsey Sharp second, Alex Bell third.

MARK SHERMAN

Brendon Byrne provides a fascinating insight into the last fifty years.

The BMC was founded in 1963 by Frank Horwill with the first race promotion in 1964. The aim was to improve the standard of British middle distance standards because Britain was becoming less successful in major events. How have things changed? In this article rankings from 1958 until the present day have been looked at. In 1958 the 10th best for men was 1:51.6, 50th best was 1:54.5 and 100th best was by modern standards a modest 1:56.

For women 800m racing was in its infancy after it had been banned following the exhaustion of runners in the 1928 Olympics. It did not feature again in the Olympics until 1964. In that event Ann Packer took the gold medal in Tokyo in a time of 2:01.9 a new world record. It is a time that still looks good in the present period. She was a novice at the event and then retired from competition. Earlier she had won the silver medal in the 400m too. What a talent!

Table 3 shows that 10th best for women in 1958 2:18.1 and 50th best was 2:26.6. There was no ranking for 100th place; that didn't

happen until 1973! It is worth mentioning the best tracks at the time were cinder. Adverts for En Tout Cas, the builders of cinder tracks, featured regularly in athletics magazines. It is likely that the first all-weather track in the country was built at St Marys College in around 1964.

By 1964 the 10th best male was timed at 1:50.7, the 50th best was 1:52.6 and 100th best had improved to 1:54.4. For women the 10th best time had improved to 2:08.8 and 50th place to 2:18.6. This article is concentrating on ranking lists but it is racing performances that are very important too. For example, very few British runners ran their fastest times in the British championships in Birmingham this year. Championship events can often be tactical and personal best performances are secondary to finishing positions.

Table 1 shows the best performances of all time. Seb Coe's time from 1981 was a world record. Seb won two Olympic silver medals at 800m and Steve Overt was an Olympic champion. At that time British athletes were truly outstanding in world terms at 800m and of course 1500m, which is outside the

scope of this article.

Only three of the fastest twelve fastest British runners of all time have recorded their performances since the turn of the century. Andrew Osagie's 1:43.77 was set during what was arguably the best 800m race of all time at the London Olympics in 2012. It is worth mentioning that Peter Elliott, Tom McKean and David Sharp all won medals at major championships at 800m too.

For women athletes as well as the Olympic gold for Ann Packer, Kelly Holmes also won the gold medal at 800m at the 2004 Olympic Games in Athens. She did the double winning the gold medal at 1500m as well. Laura Muir's performances are of course ongoing at the time of writing. There isn't space to go into the all of the international successes of the top ranked British athletes.

How have standards changed in more recent years? Women's performances have shown the most striking improvement. The 10th best improved to under 2 mins 10sec in 1967 and has gradually improved to sub 2min 2sec in the last decade. 50th best has improved to around 2min 7sec and 100th best has moved on to around 2min 10 sec.

Table 1

All time 800m bests by UK Men

1	1:41.73	Sebastian Coe	10.6.81
2	1:42.88	Steve Cram	21.8.85
3	1:42.77	Peter Elliott	30.5.90
4	1:43.77	Andrew Osagie	9.8.12
5	1:43.84	Martin Steele	10.7.93
6	1:43.88	Tom McKean	29.7.93
7	1:43.89	Michael Rimmer	29.8.10
8	1:43.98	David Sharp	19.8.92
9	1:44.09	Steve Ovett	31.8.78
10	1:44.52	David Webb	20.7.19
11	1:44.55	Garry Cook	20.8.84
12	1:44.59	Tony Morrell	21.7.88

22 athletes have broken 1:45

Table 2

All time 800m bests by UK Women

1	1:56.21	Kelly Holmes	9.9.95
2	1:57.42	Kirsty Wade	24.6.95
3	1:57.69	Lynsey Sharp	20.8.16
4	1:57.93	Jenny Meadows	10.8.09
5	1:58.2	Rebecca Lynn	11.6.06
6	1:58.42	Laura Muir	21.7.19
7	1:58.45	Marilyn Okoro	26.7.08
8	1:58.65	Diane Modahl	12.7.90
9	1:58.74	Jemma Simpson	22.7.10
10	1:58.86	Shelayna Oskan - Clark	27.8.15
11	1:58.77	Shireen Bailey	15.9.87
12	1:59.02	Susan Scott	24.3.06

25 athletes have broken 2 minutes

An interesting point in this year's rankings is that 41st ranked runner is World Heptathlon champion Katarina Johnson-Thompson with 2:07.26 set in Doha. A heady 2min 2sec is now the standard now to expect for the top 10.

The top 10 for men first went below 1min 50sec in 1965 and below 1min 48sec in 2006. It has largely remained at this level although this year is the first time that the top 10 has gone below 1min 47sec to 1min 46.08sec, with 17 year old Max Burgin's 1:45.36 being a particular highlight. The top 50 went below 1min 51sec in 2008 and this year for the first time the top 50 has just gone below 1min 50sec for the first time. The top 100 in the last decade has averaged just under 1min 52sec.

It is clear that standards have improved, as you might expect, from 1958 down to the present day for both men and women. There signs however that the standard for male athletes is levelling off with a remarkable improvement in 2019, the same applies for the women. We look forward to this being a start of a renaissance for GB 800m running.

Table 3

	Men			Women		
Performance Rankings						
	10	50	100	10	50	100
1958	1:51.6	1:54.5	1:56	2:18.1	2:26.8	
1963	1:50.7	1:53.4	1:55	2:15.1	2:26.4	
1968	1:49.6	1:52.6	1:54.4	2:08.8	2:18.6	
1973	1:48.9	1:52.3	1:53.8	2:05.6	2:13	2:16.5
1978	1:48.8	1:51.3	1:52.5	2:03.7	2:10.2	2:14.2
1983	1:46.6	1:50.78	1:52.47	2:04.9	2:09.9	2:12.5
1988	1:46.13	1:49.83	1:51.95	2:03	2:09.5	2:12.4
1993	1:47.49	1:50.6	1:52:1	2:04.17	2:09.74	2:12.84
1998	1:48.71	1:51.27	1:52.7	2:04.61	2:10.5	2:12.9
2006	1:47.2	1:51:4	1:52.62	2:02.79	2:08.53	2:12
2009	1:47.92	1:50.56	1:52:08	2:02.39	2:07.33	2:11.01
2012	1:47.8	1:50.31	1:51.8	2:02.38	2:08.04	2:11.02
2015	1:47.5	1:50.2	1:51.95	2:02.33	2:07.5	2:10.4
2016	1:47.96	1:50.33	1:51.82	2:01.98	2:06.76	2:10.3
2017	1:47.92	1:50.07	1:51.77	2:02:09	2:07.15	2:08.84
2018	1:47.12	1:50.11	1:51.9	2:02:02	2:07.84	2:10.53
2019	1:46.08	1:49.9	1:52:08	2:01.74	2:08.40	2:10.82



Doha 800m semi-finalist
Elliot Giles in action.

MARK SHEARMAN

BMC Book Reviews

ADVANCED MARATHONING 3RD EDITION

By Pete Pfitzinger and Scott Douglas

Publisher Human Kinetics

Reviewed by Brendon Byrne

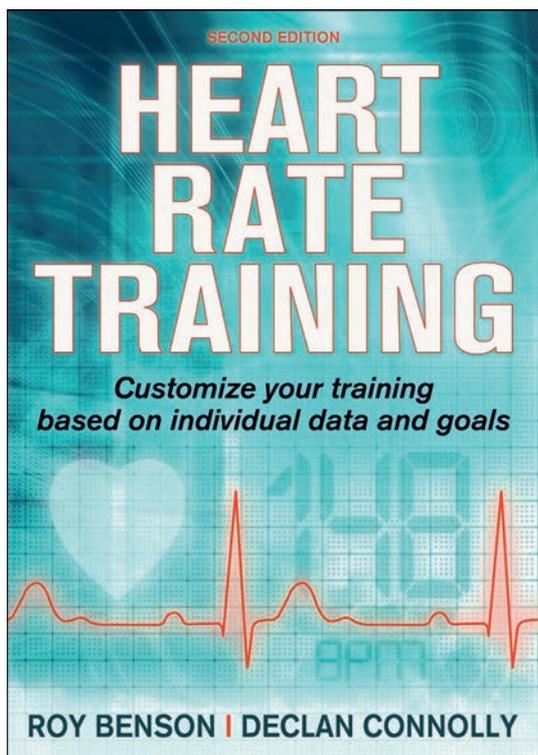
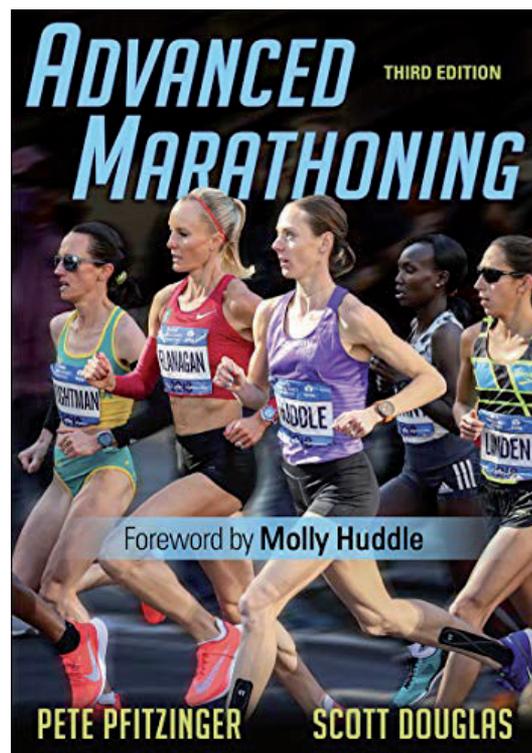
Both of the authors are experienced athletes and coaches and they have brought their expertise and experience into this 3rd edition of the book. All aspects of training for marathons are covered including physiology, nutrition and hydration. The importance of iron to distance runners is included. Pitfalls of marathon preparation are covered such as too many hard interval sessions and over training. Just as important are the sections on how to avoid and deal with the problems that may arise. Another part covers recovery. Much of the book is relevant to training for middle distance events too.

There are extensive sections on schedules on training for various weekly mileages from under 55 to over 100 miles a week. A useful part deals with tapering for a big event. Another part deals with supplementary training including drills, flexibility and strength needed. Good explanations for action are included.

Throughout the book there are reviews of some prominent marathon runners including Molly Huddle who wrote the foreword to the book. Other interesting ones include Paula Radcliffe, Mary Keitany and Eliud Kipchoge. There may well be an addition to the career of Kipchoge to come!

An interesting item deals with the assessment of maximum heart rate. The formula they use is $206 - (0.7 \times \text{your age})$. This formula may be used with the Heart Rate Monitoring book too.

There is an extensive reference section. Many of the terms used throughout are explained towards the end. Overall this is a very useful book, not only for marathon preparation, but a fair bit is relevant to middle distance. This may also compliment Run Smart by John Brewer which was reviewed in an earlier issue of the BMC News.



HEART RATE TRAINING

By Roy Benson and Declan Connolly

Publisher Human Kinetics

Reviewed by Brendon Byrne

This is a comprehensive guide to using heart rate as a guide to training as the title may suggest. It deals with the physiology of exercise and running in particular. The authors make the point that every athlete is an individual with individual responses. One of the starting points is establishing what your maximum heart rate actually is. The best and most expensive way is in the laboratory. However, the authors outline a strategy that works quite well. This is very important as the various training zones athletes used would derive from this.

An early section deals with what the monitor can reveal about your training and also shows the connection between heart rate and oxygen consumption. This is very useful information for both the coach and athlete. An important section deals with targeting sports specific fitness and how to raise the anaerobic threshold, speed and power development. Designing a programme and sports specific programmes are included. As well as running, cycling and swimming are included in the programmes. The programmes stress periodisation and the various heart rate zones of training. There is scope for cross training here too. Another important section deals with the heart rate as a guide to recovery from exercise.

Although not geared towards one brand or monitor it makes the point that monitors are now more accurate and reliable than earlier models. They can now give other information such as time in training zones and calorific expenditure for example.

This is a very useful guide to the use of heart rate monitors. It is rumoured that another edition of the book is in the pipeline.

Congratulations to the athletes, coaches and volunteers nominated for awards in this Stellar year for the BMC and distance running.

MALE ATHLETE OF THE YEAR: Jake Wightman.
Also nominated Elliot Giles and Callum Hawkins.

FEMALE ATHLETE OF THE YEAR: Laura Muir.
Also nominated Ciarra Mageean, Sarah McDonald.

MALE YOUNG ATHLETE OF THE YEAR: Max Burgin.
Also nominated Alex Botterill, Oliver Dustin.

FEMALE YOUNG ATHLETE OF THE YEAR: Isabelle Boffey.
Also nominated Keely Hodgkinson

COACH OF THE YEAR: Andrew Henderson.
Also nominated Luke Gunn.

LIFETIME SERVICES TO COACHING AWARD: Phil O'Dell.
Also nominated Andy Carter, Bill Foster, Peter Thompson

FRANK HORWILL AWARD FOR OUTSTANDING SERVICES TO BMC:
Paul Hayes.



MARK SHEARMAN

BMC female athlete of the year Laura Muir alongside eventual winner Sifan Hassan in the IAAF World Champs 1500m final (2019).

Basil Heatley

THE 'GREAT' COVENTRY GODIVA RUNNER OF THE 1950'S & 60'S

Obituary by Alastair Aitken

Basil Heatley's athletic success has been almost forgotten by many people but, few British distance men could claim the type of success that he had, over a space of 15 years or so.

Basil was born 21/12/33 and lived to 3/8/19. He was a self-coached athlete, who won the National cross country senior championships in 1960, 61 and '63 and the International (*Forerunner of the World cross*). He won that from 1964 Olympic steeplechase

Champion, Gaston Roelants & Martin Hyman) in 1961, the year he ran to a World 10 mile track record of 47:47.0 at Hurlingham. He achieved a World Marathon Best of 2:13:55 in the Windsor to Chiswick Poly Marathon on the 13th of June 1964; and a silver medal in the Tokyo Olympic Games on the 21st of October 1964. *First Six: 1 Abebe Bikila (Ethiopia) 2:12:11 (WB); 2 Basil Heatley 2:16:19; 3 Kokichi Tsuburaya (Japan) 2:16:22; 4 Brian Kilby the 1962 Commonwealth & European Champion (GB) 2:17:02; 5 Jozef Sutoe (Hungary) 2:17:55; 6 Leonard Buddy Edelen*

Winning the 1963
National XC title.



MARK SHEARMAN

(USA) 2:18:12.

It was on the 9th of December 1961 Basil Heatley got married to his wife Gill. In that Olympic year of 1964 Gill had twins to go with a young daughter they already had and, before one more daughter to make it four so, often Basil had broken nights of sleep as they needed attention. However, Basil followed his normal training pattern of 100 to 125 miles a week which included intervals. It was amazing to think his shoes then had crepe soles. They were Tiger Cubs, which he wore for road racing. Crepe and very thin rubber soles and, canvas sides to them but, at least they were nice and light but did not compare with the modern running shoes and, looking further back when he finished his National service, he came out with several pairs of Army plimsolls to run in which, these days runners would balk at, if they were asked to run across the street in them! He got the cobblers to customise some other shoes so he could wear them in training.

Basil stressed "At home before the Olympics I did have broken sleep with three of four daughters born and absolutely no mod cons. It was very difficult for both of us."

There is so much one can say about Basil but at least his account of the Olympic marathon where he achieved a silver is one thing that should definitely not be left out.

The Tokyo Olympic marathon came on the 21st October 1964: "It was very humid so none of us warmed up much. I fully believed Brian (Kilby also Coventry Godiva) would be thereabouts at the finish. His pedigree said nobody would run away from him. He was perspiring before the start and I had a stitch so I had to start quite slowly"

Heatley receives his
marathon silver medal
in Tokyo 1964.



MARK SHEARMAN

"When we made the turn I was already 2min 30sec behind Bikila" (at the 25000m point the order was 1 Bikila 1:16:40; Jim Hogan (The European Champion of 1966) 1:16:50; Ron Clarke 1:18:02; Tsuburaya, Jozsef Sutoe; Mamo Wolde 1:18:44; Kenji Kimihara 1:19:21; Billy Mills 1:19:25; Brian Kilby and Basil Heatley 1:19:35)

Basil continues: "We made the turn and, Brian was running with me. I was quite despondent and then, we were either overtaking jogging runners or those who were sitting by the roadside at 18 miles. If you are sitting by the road side at 18 miles somehow, you have got it wrong. Ron Clarke, of course, could be excused as he was more of a novice at the marathon than I was at the event. Brian and I were gradually pulling everybody back. There was a Japanese and Hungarian vest ahead of us. I knew Sutoe, as he was a good 10k runner but I knew he was not better than me at the distance. I focused on those two which took me away from Brian and I could see the worst scenario unfolding, with Japan looking at the only medal they would gain on home soil and, I was looking like I was going to catch their only medal hope of the Games. I caught Tsuburaya in the stadium near the finish. Coming through in the marathon like that works for you or it doesn't and it was a help to have the experience of training and racing for fifteen years."

"I never call myself a marathon runner," that was what Basil Heatley said to me, even though he had achieved an Olympic silver medal. "I felt really at home doing cross-country rather than the road or track I was temperamentally suited more to being a Winter runner than a Summer racer, I think had there been half marathon races in existence when I was running well, that would have been my best road distance."

Again having said that, I would like to point out about some of his races he did on the track. He won the Midland 3 miles in 13:45.6, 6 miles in 28:16.4 and the 10 miles in 50:30.8. That was a hat-trick in 1961. He ran in international matches, even over 5k, and in London in 1963 he ran 28:55.8 on cinders, winning a 10k at the White City with Mel Batty second. That meant that he was the fifth fastest in the World that year! He was 2nd to Brian Kilby (2:16:45) in 2:19:56 in in the AAA's marathon Championships. When he broke the World record with 2:13:55 in 1964, he did not believe it until he read about it in the paper the next day. Ron Hill was 2nd in that in 2:14:12 and, of course, went on in 1970 to set things alight with a 2:09:28 in the Commonwealth Games marathon in Edinburgh.

Basil remembers finishing behind the

brilliant cross-country runner Frank Sando, Alain Mimoun and Ken Norris but he matured and became just as great a runner. To begin with he did love seeing Gordon Pirie and Jim Peters in the famous London to Brighton road relay and locally Jack Holden.

There were injuries that he suffered, particularly with his Achilles tendon in 1962 and like all athletes in their careers injuries come and that, would explain why he did not always manage to keep his high standard up at top level but his sum total of good results was, without doubt, exceptional.

He recalls his start in 1950 when he joined Coventry Godiva club. It was after running in a novices race which he won that they spotted his talent very quickly and signed him up.

He pointed out that when he was running well Coventry Godiva had 4 runners who could average 2:15 for the marathon which, at the time, would beat a combined team from the rest of the world.



MARK SHEARMAN



MARK SHEARMAN

Both photos: Heatley in action during the 1963 London to Brighton relay.



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