



BMC News



OFFICIAL JOURNAL OF THE BRITISH MILERS' CLUB
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*The Start of the 1500m
A race – Trafford GP.
Photo: Peter Brown*

BMC NEWS AUTUMN 2018

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Cover: Alex Bell
© Mark Shearman

Back Cover: BMC award winners Jake Wightman, Laura Muir, Keely Hodgkinson and Max Burgin.
Photos 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 Winter Edition of BMC News 2018.

On behalf of the BMC and our members I would like pay tribute to our dearly departed Sir Roger Bannister, Diane Leather Dick Quax, and Bruce Tulloh. All have shaped the world of athletics in their time and to the present day. We pay tribute to these legends of our sports through the words of Alastair Aitken and Peter Thompson.

Their spirit lives on in the form of our male and female athletes of the year, the peerless Laura Muir and Euro bronze medallist Jake Wightman. Laura Weightman (European 1500m bronze) and 5000m silver medallist Eilish McColgan also shone brightly in 2018.

The future looks bright in the form of our European Youth Champions over two laps, and BMC young athletes of the year Max Burgin, and Keely Hodgkinson. Kane Elliot (1500m) and Thomas Keen (3000m) also took Euro U18 crowns. Bannister, Leather et al. would surely have been impressed by our Sub-2-minute 800m barrier breaker Alex Bell, with her front-running gusto.

I consider it a great honour to be taking on the place of Editor from the excellent Matt Long, who has sadly had to step down for personal and family reasons, after 4 years in post.

The BMC holds a special place for me as a former athlete who competed at the 1st BMC GP at Wythenshawe in 1995 finishing 2nd to Neil Caddy over 1500m. I am also privileged to be involved in organising or commentating at BMC meetings. The club is something that British athletes, and our many overseas guests can be proud of; you have all played your part in that success.

We have expanded our coaching offering to reflect our desire to help and advice our coaches and athletes towards success including a section from our Trafford coaching seminar, in August, organised by Neville Taylor, where our guests include Liz Nuttall (McColgan) and Dr Jess Piasecki.

Huge thanks to David Lowes and Tim Brennan for their support, and to our superb team of writers, and photographers who deliver excellent and innovative work on every edition.

We are also grateful to Britta Sendlhofer and Athletics Weekly for their role in the publication of this magazine.

"We run, not because we think it is doing us good, but because we enjoy it and cannot help ourselves. The more restricted our society and work become, the more necessary it will be to find some outlet for this craving for freedom. No one can say, 'You must not run faster than this, or jump higher than that.' The human spirit is indomitable." (Sir Roger Bannister)

Stephen Green, BMC News Editor



The editor in action at the 1994 Commonwealth Games

Chairman's Notes

Welcome to the Autumn 2018 BMC News. I must start my Chairman's notes with thanks to the outgoing BMC news editor Matt Long. Matt has had to stand down as editor due to personal circumstances. Since taking over the role for the Autumn 2014 magazine Matt has innovated and structured the magazine, making it a lively publication which has won praise for every edition. We wish Matt well, thank him enormously and look forward to seeing him back soon playing a full role in the BMC. I also welcome Steve Green who has stepped in at a late stage to edit this edition and will take over new productions. Steve is already a huge contributor to the BMC particularly with the Trafford Gold Standard and Grand Prix Meetings and I know he will bring his own ideas and improvements to the magazine.

Our last edition of the BMC News marked the passing of the first man to run four minutes for the mile, Sir Roger Bannister. Sadly, we are now commemorating the achievements of Diane Leather the first woman to break five minutes, who died in September. Both world records were set in May 1954 and we have now lost two great pioneers in the same year.

As a club we are always looking to adapt and improve what we do. The secret of success is to stay true to our aim to improve the world standing of UK Middle Distance but to do that in a way which is relevant to current situations. A good example of that is our mentoring schemes. Athlete mentoring responds to the challenges faced by our younger members in making the transition from being a very good age group athlete (you need to be good to be a BMC member!)

to a successful senior athlete. The strength of our club community is indicated by the number of senior athletes who have stepped forward to act as mentors. Our coach mentoring relaunched this year fills a need left by a reduction in mentoring by the governing bodies. If you want to know more about these schemes, then details can be found on the website.

Our membership is now above two thousand, the biggest club in the country. To go with this, we have more meetings and races than ever before. There have been many great races and individual triumphs through the season and you can be reminded of these in our season review and in the athlete of the year awards. My two personal highlights would be Alex Bell breaking two minutes in a BMC women's only race and Max Burgin running 1:47.5 as a 15-year-old. Many have gone close to the 2-minute barrier, but Alex is the first to make it. It was a great shame that this fantastic achievement did not lead to selection for the European Championships. For Max, as well as his time in the Sport City GP, it was notable that he then bettered this in the European U18 Championships. It is exactly what we want, that our races are a stepping stone to international championship success.

We must be very pleased with the success of the season which was achieved without the benefit of a major sponsor or governing body support but with the generous support of a member donation. This helped cover not only the competition program but also our training courses and coach seminars. On behalf of all our members we are very grateful for the donation. As we go to press we are still in discussions with different potential sponsors for next season.

With the club doing more and more we are part of everyone's season planning. I really hope that this does not lead to our races being taken for granted. The PB rate was 43% this year. That is a good deal! Turn up for 3 races and you have an 80% chance of at least one PB. With so many opportunities it is important that each race is approached as a unique opportunity with a commitment to race hard and chase your target times. If you do this you will get your reward, but failure will follow if you think there will be another chance next week and don't make that commitment.

The BMC is now in its 55th year. Congratulations to member Bill Bennett who recently celebrated his 80th Birthday and 55 years of membership

I hope you enjoy the magazine.

Tim Brennan
BMC Chairman



Marc Brown in action
in the Sportcity 5k.

PETER BROWN



BMC Academy Camp

THE Residential weekend at Spinkhill, just south of Sheffield, on October 26-28 lived up to its high standards and now legendary status. It is where athletes of all abilities train, learn, have fun and make friends writes Academy Course Director, David Lowes.

With over 80 attendees this year and with diverse ages, the course as always is tailored to meet everyone's needs and that is no easy task, but it is always achieved! The venue is now in its 14th consecutive year and the reason being is that it is difficult to match the training facilities, accommodation, food and a receptive staff. As the person in charge, this is also my 21st consecutive year running these camps with previous venues being Ardingly (Sussex), Ogmere (South Wales), Cliff College (Derbyshire) and Irthlingborough (Northants). Everyone of these has its merits and some have run more smoothly than others, however one common denominator is the attendees who may now be in full-time employment, still talk fondly of their time at least one of these places.

Dr Jessica Piasecki (Coulson) is one

such athlete who has good memories of attending these camps and said: "We (Stockport) came down in a big group and we were all awestruck as this was our first training camp environment. It was hard work, but we learned so much and had a great time. I would recommend these camps to anyone."

The tables were turned somewhat as she spoke to us this time and about the "Nutritional importance for bone health and athletic longevity." The presentation targeted both females and males and gave a great insight into keeping healthy along with prevention.

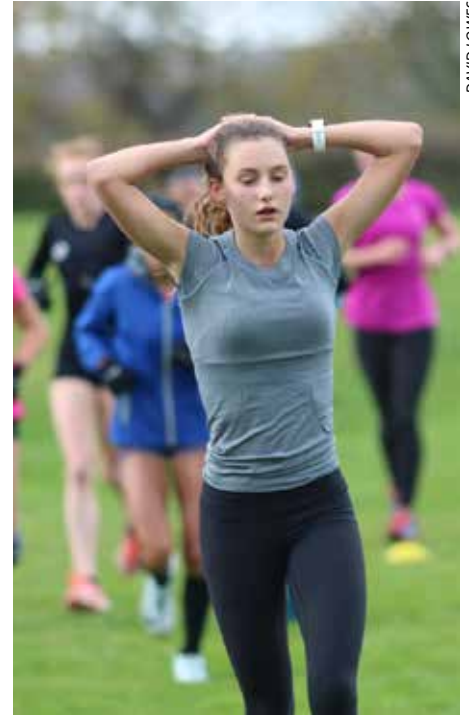
The usual fares of pre-breakfast runs are part of the ingrained tradition of these weekends along with athlete education in an inter-active format so that everyone gets to share their valued opinion. The BMC Quizzes are always well received and very competitive and the "Your Shout" theme on the Saturday evening is one of the highlights. This is where a group are given a question or statement and they have to work together as a team for 15min



and present their findings to the coaches and audience. It always throws up some surprising knowledge bites and of course some incorrect ideas. No one really minds, but it is an excellent way of learning in a



DAVID LOWES



DAVID LOWES

relaxed format and keeping with the athlete mind-set it is done in a competitive manner with points given to each presentation. There are always winners, but never any losers

Specific sessions, drills, stretching are all included in the ever-changing format and new this year was the “Coaching Forum” where the athletes and visiting coaches were encouraged to ask the panel about any aspect they wanted clarifying. As always, the final session on the Sunday, is the now legendary fartlek which shows that even with tired legs, determination and sheer will power will steer them through. The whole weekend is based on motivation and trying to focus on how they can raise their fatigue tolerance levels. A look at some of the photographs on these pages speaks louder than any words. ■



DAVID LOWES



DAVID LOWES



DAVID LOWES



Annual Award Winners 2018

MALE ATHLETE OF THE YEAR:

JAKE WIGHTMAN

FEMALE ATHLETE OF THE YEAR:

LAURA MUIR

Also nominated ALEX BELL

MALE YOUNG ATHLETE OF THE YEAR:

MAX BURGIN

Also nominated JAKE HEYWARD

FEMALE YOUNG ATHLETE OF THE YEAR:

KEELY HODGKINSON

COACH OF THE YEAR:

GEOFF WIGHTMAN

Also nominated ANDREW HENDERSON and MARK HOOKWAY

LIFETIME SERVICES TO COACHING:

MIKE DOWN

Also nominated ANDY CARTER, JACK HOWEY and DAVE TURNBULL

FRANK HORWILL AWARD for OUTSTANDING SERVICES TO BRITISH MILERS CLUB:

HUGH BARROW

There can be no better example of an athlete using the BMC pathway to success than the 2018 male athlete of the year winner Jake Wightman.

Since lining up for his first Grand Prix race on May 19th 2012 Wightman and his father/coach Geoff have been huge supporters of the event, using the Grand Prix races to achieve qualifying standards, sharpen up and experiment with tactics.

While Wightman has now established himself as one of Britain's top middle-distance runners it is worth recalling that day six years ago when he finished runner-up in the 1500m F race at Manchester's Sportcity Stadium.

Significantly on that occasion the Edinburgh AC junior opened his season with a personal best of 3mins 51.74secs which carved off almost eight seconds from his previous PB.

Also, that summer Wightman used the Grand Prix to sharpen up his 800m speed clocking a PB of 1:51.6 to win the H race at Solihull in July and then the following month winning the B race at the Grand Prix race in Bedford.

Running fast and winning races quickly became his trademark style as Wightman as the following year he gave the clearest sign that he was star in the making with victory over 1500m at the European Under 20 Championships in Italy – having earlier in the season sharpened up with Grand Prix victories and PBs over 800m at Sportcity (1:49.27) and then Watford (1:48.45).

Every year since until this summer the Wightman team have used the BMC events to good effect even though his success has opened numerous doors all over the world including Diamond League races on top of his international commitments that this year reached a new high with a bronze medal in the 1500m at the European Championships on top of fourth in the 800m at the Commonwealth Games in Brisbane.

Add on PBs in the 800m of 1:44.61 in the London Anniversary Games and 3:33.96 in the Monaco Diamond League event and it is no surprise that Wightman didn't have time in his schedule to run a BMC event – for the first time.

But that is ultimately the destination the BMC seek for their pathway and why Jake Wightman is the deserved winner of the male athlete of 2018.

JAKE WIGHTMAN



MARK SHEARMAN

LAURA MUIR

No female middle-distance runner in Britain could have had more words written about her during this summer than Laura Muir.

The new European 1500m champion and double World Indoor Championships medallist has deserved all the plaudits that have come her way, the latest of which is being named as the BMC's female athlete of the year.

This year Muir has strengthened her position as one of the top middle-distance runners in the world with a series of outstanding performances culminating in her being crowned Diamond League champion in Brussels, where she ran a superb



MARK SHEARMAN

tactical race to defeat three of the top four fastest women in the world.

Her winning time of 3mins 58.49secs was her fourth sub four minutes clocking of the summer and which she ended as fifth on the IAAF World Rankings with a season's best of 3:58.18, which she ran at the Lausanne Diamond League meeting.

Those are world class stats for a woman who has been working hard in the sport for over ten years because like Wightman she is not a sudden overnight success story.

Indeed, it is interesting to note that in the same year that Wightman was winning the European Under 20s 1500m title Muir finished third over the same distance at the 2013 Under 23s age group version in Finland having made her international debut the previous year at the World Juniors in Spain (16th in the 3000m).

That was the same season in which Muir first appeared in a BMC Grand Prix event finishing ninth the 1500m A race at Sportcity in a PB of 4:21.17, which shattered her outdoor best of 4:38.90 the previous summer, though she had since run quicker indoors.

But it was that 2013 season that really saw her propelled onto the international stage not just in European but on the global scene when reaching the semi finals of the 8000m at the World Championships in Moscow.

It is also worth recalling that 2013 opened with Muir winning the 3000m at the BMC Indoor Championships in Glasgow, where she has been studying to become a vet, in a then PB of 9:02.35.

MAX BURGIN

The teenager from Halifax, who is coached by his Grandad Brian, had summer to remember that has been recognised by winning the junior athlete award.

Those at Sportcity in May won't ever forget Burgin's magnificent victory in the 800m A race when he set a World Age 15 record of 1mins 47.50secs.

Proudly wearing his BMC vest Burgin was content to sit in the pack before hunting down Spencer Thomas for victory in a time that was also a British under 17 record.

The previous UK U17s record had been 1:48.24 set by Sean Molloy in 2012, while Burgin's best ahead of the race had been his 1:49.42 from last summer.



MARK SHEARMAN

Could be better that? Well he certainly when achieving the dream double outcome for any runner when winning the European Under 18s 800m title in Hungary and celebrating that first international success with a PB of 1:47.36, shaving 0.14secs off that Manchester mark.

That put him easily top of the UK U17 Rankings at 8000m and he also ended the summer second in the 1500m rankings after a huge PB of 3:47.70 for fourth place in the BMC Gold Standard meeting at Trafford at the end of July.

KEELY HODGKINSON

Like her GB team-mate Burgin Leigh runner Keely Hodgkinson delivered her best performance of the summer when it mattered most in the final of the European Under 18 Championships.

The teenager lifted her first international title on her debut for GB in Hungary with a consummate performance clocking a time of 2mins 04.84secs – one of four 2:04 performances this summer to underline her consistency.

Earlier in the summer at Sportcity she didn't quite match the headlines of Burgin but a fifth place in the A 800m in a then PB of 2:05.27 was job done as it was the qualifying standard for the Europeans. Two weeks later she bettered that with interest



MARK SHEARMAN

clocking a lifetime best of 2:04.26 for fourth in the A race at Watford to put her top of the 2018 UK U17 Rankings.

In a golden summer further success came at the England Under 20 Championships and the UK School Games, where she ran a record time of 2:04.89.

Also, interesting to note that during the winter she showed good strength and stamina to finish runner-up at the English Schools' Cross-Country Championships and was fifth in the 'National'. What a talent.

GEOFF WIGHTMAN

There are not many jobs Geoff Wightman hasn't done in athletics – from agent, to administrator and Olympic Games announcer – but one suspects that his proudest achievement will be the work he has done as coach to his son Jake.

Wightman's group has recently expanded to include internationals Harvey Dixon, Steph Twell, and Katie Snowden, indicating that his coaching lore is gaining increasing recognition.

Jake's selection as the BMC male athlete of the year for 2018 is testimony to his superb summer, his best yet as a senior and further proof, if any was needed, that he has been handled well in making the progression from promising teenager to fully fledged senior international.

By the same token Geoff's award as coach of the year rightfully recognises his part in Jake's success story in a strong category that also saw commendations to Andrew Henderson and Mark Hookway.

Jake once said of their relationship: 'I think we are quite unique.' It could be that the best of their partnership is yet to come.



MARK SHEARMAN

MIKE DOWN

Mike Down has been part of the Bristol and West Country coaching scene for longer than anyone can remember and while he has now cut back on his coaching duties – a concession to entering his eighth decade – he is not putting up his feet just yet.

As a volunteer coach he happily led big groups in Bristol & West AC and among his most celebrated names were internationals Ian Gillespie – still 19th on the UK All-Time Lists for 5000m with 13:18.06 - Rob Whalley and Richard Peters.

He is just as likely to be seen now working as men's team manager at national events and admits that regaining the National 12-Stage title last held by Bristol AC in 1980 remains his Holy Grail.

A man of firm convictions and often outspoken has ensured he has had his runs-in with authority but no-one can doubt his passion for the sport and willingness to help runners fulfil their potential.

The sport has been richer for his lifelong involvement.



MARK SHEARMAN

HUGH BARROW

Hugh Barrow's place in the history of the BMC is guaranteed – as he was the first affiliated member.

Barrow signed up for membership in 1963 which will be a lifetime or two removed for the younger members of the club. He has been running all his life and in 1960 was the Scottish Boys cross country champion. By the end of the decade he finished runner-up in the 1500m at the Scottish Championships.

In 1963 he was the first of 35 individuals who responded to Frank Horwill's plea to do something about the parlous state of British distance running following the heady days of Roger Bannister and Derek Ibbotson.

Barrow had hoped to become the first runner from Scotland to break four minutes for the mile but had to settle for a best of 4:01.0.

In an interview with David Lowes for the BMC News Barrow admitted that was one regret of his athletics career: 'You can always find excuses, injuries etc but I just didn't reach the goal I had set for myself, end of message!'



MARK SHEARMAN



BMC 2018 Season Review

It was a great season for the BMC with some fine individual performances and more racing opportunities than ever before.

- First women's sub 2 minutes in a women's only race – Alex Bell 1:59.93
- World age 15 best – Max Burgin 1:47.5
- BMC 3000m Record – Laura Muir 8:37.21 (January indoors)
- Most Meetings Ever- 54
- Most Races Ever - 662
- Most Finishers Ever - 6,383
- One European Championship qualification
- Six World Junior qualifications
- Twenty-Three European U18 qualifications

WOMEN'S 800M

The women's 800m was the stand out event in 2018, topped by a brilliant run by Alex Bell in the Watford Grand Prix for a first sub two-minute run and personal best. In her post-race interview Alex commented "I had a plan and that was to stick with the pacemaker because I knew from my training I was in good shape. I wasn't sure about running a personal best, but I went off hard and kept pushing it as hard as I could to 600 metres and then dug in."

The pacemaker in this case was Phillipa Lowe; The UK 400m trial finalist took Bell all the way to 600m setting up the perfect scenario for Alex to push on.

Alex's 1:59.93 was the first sub-2 ever in a BMC women's only race. It came one year after Lynsey Sharp ran 1:59.33 to become

the first woman ever to run sub-2 in BMC race, achieving this in a mixed race at the same venue. It also earned Alex the top tier Grand Prix prize of £1000.

There was also a lot of depth to the event with one of the best BMC ranking lists and the second-best year ever in the Grand Prix. The women's 800m is in fact at a high point, with the five best Grand Prix years being the last five.

A feature of the season was the fast times run in mixed races, particularly one week in June when we had 5 top quality performances at five separate venues. This is great preparation for championship racing and ideal when a good race is wanted at a local venue. It's fun though to imagine all the ladies on the track together in one female only race, what a race that would be!

BMC 2018 VIRTUAL 800M - BEST FEMALE PERFORMANCES IN MIXED RACES

	Perf	Name	Club	Pos	Venue	Date
1	02:00.44	Lynsey Sharp	Edinburgh AC	6rJ	Loughborough	23-Jun-18
2	02:00.99	Sarah McDonald	Birchfield H	5C	Tipton	19-Jun-18
3	02:01.60	Katie Snowden	Herne Hill	6rD	Eltham	18-Jul-18
4	02:01.78	Revee Walcott-Nolan	Luton	8rE	Eltham	20-Jun-18
5	02:01.93	Angie Petty	New Zealand	3rB	Exeter	28-Aug-18
6	02:02.01	Shelayna Oskan-Clarke	Windsor Slough Eton	9rE	Eltham	20-Jun-18
7	02:02.11	Laura Weightman	Morpeth	4rC	Chester-le-Street	18-Jun-18
8	02:02.62	Jemma Reekie U23	Kilbarchan	1rF	Scotstoun	01-Jun-18

BMC BEST PERFORMANCES 2018 IN WOMEN ONLY RACES

1	01:59.93	Alexandra Bell	Pudsey & Bramley	1rA	Watford	26-May-18
2	02:00.88	Sarah McDonald	Birchfield H	1rA	Watford	08-Aug-18
3	02:01.64	Alexandra Bell	Pudsey & Bramley	1rA	Stretford	18-Aug-18
4	02:01.75	Katie Snowden	Herne Hill	1A	Eltham	07-Jul-18
5	02:01.98	Hanna Hermansson	Sweden	2rA	Eltham	07-Jul-18
6	02:02.41	Laura Weightman	Morpeth	1A	Watford	11-Jul-18
7	02:02.48	Ciara Mageean	University College Dublin	1rA	Stretford	28-Aug-18
8	02:02.64	Mari Smith U23	Birchfield H	2A	Watford	11-Jul-18
9	02:02.70	Alena Brooks	Trinidad and Tobago	3rA	Eltham	07-Jul-18
10	02:02.94	Sara Kuivisto	Finland	4rA	Eltham	07-Jul-18



Clockwise from top:
The 800m B race underway at the Trafford GP.
Katie Snowden wins the Eltham GP 800m in 2:01.75.
Kristian Jones wins the Loughborough 5k in 13:45.25.

PETER BROWN

DAVID LOWES

MEN'S 5000M

BMC 5000m races showed something of a resurgence in 2018 with sub 14-minute races at three of the four Grand Prix meetings showing you don't have to go to Belgium for fast races.

Best race of the year was at the Loughborough Grand Prix on 23rd June where 8 men broke the fourteen minutes barrier led home by Kristian Jones in 13:45.25.

We also staged races in two 5000m festival meetings, at Lee Valley in May and Milton Keynes in August. These were good races, with Music, DJs, Track-tents and food to boost the atmosphere. The events were a lot of fun and whilst we can't do this in every meeting we may well look for other opportunities.

Across the season we had twelve sub 14-minute performances and sixty three sub 14:30, making it a very successful season.

Maybe there is something special about June 23rd but possibly our best ever 5000m came on the same day in 2001 with a great race at Solihull where fourteen went sub-fourteen, including the first runs under the barrier for Mo Farah and Chris Thompson.



DAVID LOWES

SOLIHULL – 23rd June 2001

1	Craig Mottram	13:23.94	PB
2	Mohammed Yaaqub	13:27.09	PB
3	Matt O'Dowd	13:30.56	PB
4	Rob Denmark	13:36.30	SB
5	Glen Stewart	13:37.17	PB
6	Allen Graffin	13:40.07	
7	Chris Thompson	13:45.27	PB
8	Sam Haughian	13:46.35	PB
9	Julian Moorhouse	13:51.75	SB
10	Nick Wetheridge	13:53.77	PB
11	Fiachra Lombard	13:54.58	SB
12	Mohamed Farah	13:56.31	PB
13	Guy Amos	13:56.44	PB
14	Craig Kirkwood	13:58.88	SB

LOUGHBOROUGH – 23rd June 2018

1	Kristian Jones	13:45.25	PB
2	Per Svela	13:45.65	
3	Rui Pinto	13:46.31	PB
4	Arttu Vattulainen	13:46.75	PB
5	Marius Vedvik	13:48.05	PB
6	Mohamed Mohamed	13:56.04	PB
7	Kevin Peter Maunsell	13:56.36	PB
8	Tom Mortimer	13:57.95	PB





DAVID LOWES



DAVID LOWES



DAVID LOWES

Clockwise from top left: Iona Lake en-route to a Watford GP 3k chase win.

Jamie Williamson (150) heads for home in the Watford GP – with a 3:41.59 PB.

Athletes increase the pace in the Trafford GP 5k.

Reece Ingley (blue vest) proved to be an in-demand pacer over 800m.



PETER BROWN



DAVID LOWES



DAVID LOWES



DAVID LOWES

Clockwise from top left: Jess Judd leads in the early stages of the Sport City 5k. Eventual winner Claire Duck in 3rd.

Georgia Yearby wins the C800m at Sport City.

Jonny Davies (7.57.8) led four men sub 8 mins indoors at Sheffield in January including Chris Olley.

Below: Phil Sesemann powers away to a sub -14 clocking at Sport City.



DAVID LOWES



PETER BROWN

PETER BROWN

Above: Ahmed Bashir Farah wins the Trafford GP 800m in 1:48.9.

Left: Claire Duck on her way to a win in the Trafford BMC 5K.

2019 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, 2018. 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 2019 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

The closing date for applications is 31st Dec, 2018. We look forward to receiving your application.

Bell rings the Changes

Steve Green interviews the Commonwealth Games 800m finalist, and the first woman to break 2 minutes in a BMC female-only race.

Watford – May 2nd, 2018, an expectant hush fell over the crowd on a warm yet blustery day. Eight women set off on two laps of the famous tartan.

The first lap is fast at 57 secs, led superbly by Phillipa Lowes.

The crowd's attention turns to the slight purple vested figure coming down the home straight. Most can't see the clock, but the look on Alex's Bells face says it all.

A short wait and the winning time announced - 1:59.93. An exhausted Bell lifts her arms aloft then falls to the track in exhaustion and exultation. She is congratulated warmly by her fellow athletes, then helped up and interviewed by our splendidly attired master of ceremonies Mr Peter Scott.

This was the first sub 2-minute clocking in a female only race. It was made more poignant as it was achieved by a runner who exemplifies the spirit of the club as much as any other.

"Leading up to the race I felt really good, it was my first since the commonwealth final. I ran a 600m time trail in 87 seconds which made me believe I could run 2 minutes," she recalls.

"I originally had plans to race at a meet in Belgium that day, but I so happy I came to Watford. I didn't feel the wind the whole race, I was just focused on the time, and remembered the things I did in training."

"At first, I thought I can't hang onto this pace it was so quick, but it was amazing that the pacer went to 600m. When we got to 600m I thought this is and kept up my form to the line, when I saw the clock I was overwhelmed," Bell enthuses.

It was a milestone in the journey of the former dancer, who has been encouraged by high school teacher Pete Robbins (who she still stays in contact with) to do cross-country.

"I remember I always did sports like football and used to come to dance class with muddy knees. I even ran my first race in my football boots," she says.

"Athletics was a lot of fun at Pudsey, warm up involved doing stuff like throwing a



DAVID LOWES

Alex Bell 1:59.93 at the Watford GP.

frisbee around, “she adds of her early athletic experiences.

Once she acquired some spikes and started training at her beloved Pudsey and Bramley AC, she excelled on the track, finishing second in consecutive English Schools championships in 2010 and 2011.

Bell has made a number of brave changes in her athletic and personal life. The first of which was parting company amicably with long-time coach Aaron Thomas in September 2017.

“I just knew it was time to change, I appreciate what Aaron did for my athletics, but I wasn’t in a happy place with my running. To run well you need to be happy, it’s a short career so I decided to make the move and train with Andy Henderson at Carnegie.”

Bell’s training partners include Rio Olympian Beth Potter and partner Josh Norman.

Bell is one of the few 800 runners who eschews the indoors and runs a full cross-country season. She explains this as not appealing to most track exponents but something she feels has always benefitted her.

Bell is candid about her training, that has brought her to a sub 2-minute level. Her winter work consists of a mix of track, and long intervals, with a strong emphasis on gym-work. In the summer she moves to three track sessions a week. Her maximum mileage in the winter is 52 and in summer she runs around 40 miles/week

Typical Training – Alex Bell.

Winter:	1200m (3 mins)
	plus 4 x 300m (100m jog).
Summer:	3 x 800m (3 mins)
	2 x 300 (30 secs)

It was that strength of mind and character gained through the hard winter months on the biting cold Carnegie track that helped Bell through a protracted selection process for the Commonwealth Games in March.

She had twice run the qualifying time including a 2:00.69 at Stretford in July in a BMC race. When the team was announced, there was no third berth. She was finally selected just before Christmas after a training trip to Font- Romeu.

“I became pretty despondent about it, as the games got closer, and all the girls had been talking about going to the Gold Coast, so when I got home, I was really happy to get my selection letter. It was the best Christmas present ever,” she remembers.

Once there the Pudsey star took her opportunity will relish. She took herself in the right position and qualified 2nd



Alex Bell in action at the Commonwealth Games 2018. Photo: Mark Shearman

automatically with 2:00.11. Once in the final she acquitted herself superbly to take 5th place in a World Class Field with a strong 2:00.83 as the peerless Semenya took Gold.

“I just thought, this is an opportunity to run with the best athletes in the world, so I just ran really with nothing to lose,” she said.

“The games exceeded my expectations, from an athletic point of view, and it was even better that my family, plus Josh and my coach were there, it was like a home from home in Australia,” Bell recalls.

Right up until the Summer of 2017, Bell had been working as a special constable as well as part-time in a sports retail outlet. Her shifts as a constable were the 9-7am ‘night-shift’, where she explains she saw some ‘eye-opening’ things. However, the shifts were detrimental to her running, and she decided to leave the force, her supervisor left the door open for her to return in the future.

We move to the summer of 2018 and the UK trials where she missed out on GB selection by less than a tenth after finishing fourth, behind Adelle Tracey in a race dominated by Laura Muir. She admitted that

she did not run her best race in Birmingham after getting boxed as the peerless Scot made her move with 300m to go.

Her non-selection for Berlin still rankles mainly due to the personal nature of comments made in the selection meeting. Bell believes the selection process for major championships would benefit from far more clarity and openness concerning the athletes involved.

“My non-selection for Berlin, was a massive blow to me, for many reasons, but I’m going to take that whole experience as motivation for the future,” added Bell.

Alex Bell is one of the most popular athletes on the domestic scene; many were impressed by her decision to close her season at Trafford in August at the GP, where she won over 800m in 2:01.73. She then demonstrated great selflessness in pacing Jess Judd to a season’s best of 4:07.50 just over an hour later.

“The BMC do so much for British athletes that it was a fairly easy choice for me to run at Stretford. Why travel abroad when we have so many great opportunities at home. Myself, and I know other athletes are really

grateful to the BMC," she is keen to add.

When we discuss the matter of whether she thinks she is a breakthrough athlete we get a typical response full of Yorkshire honesty.

"I've broken sub 2-minutes, which was one of my aims in the sport; but I don't really see myself as breaking through on the International scene. When I'm running sub -2 on a regular basis and making global finals then I can say I've arrived," states the Pudsey star.

The year finished on delightful note for Bell, as she became engaged to partner Josh Norman (a 3:45 metric miler) whilst on an end of season holiday on the Island of Skiathos.

"I've now got the task of planning for the wedding, which is a nice distraction during the off-season," she enthuses.

It has been a year, where Bell has seen the trials and tribulations this sport, can bring as well as the highs. Still only 26, her best years await her, both personally and athletically. We look forward to this affable young athlete continuing to illuminate the running track as he did that sunny May Day in Watford.

Alex Bell in action at the Trafford GP.



PETER BROWN

Fixtures

BMC INDOOR SEASON 2018/19



Date	Location	Event(s)	Meeting Organiser
12th December 2018	Sheffield	800 (M/W) Mile (M/W)	Tom Grantham
4th January 2019	Glasgow	3000 (M/W)	Norrie Hay
6th January 2019	Sheffield	800 (M/W) 1500 (M/W) 3000 (Men Only)	Steve Green
23rd January 2019	Sheffield	800 (M/W) 1500 (M/W)	Tom Grantham
30th January 2019	Lee Valley	800 (M/W)	Tim Brennan
5th February 2019	Sheffield	800 (M/W) 3000 (M/W)	Tom Grantham
20th February 2019	Lee Valley	800 (M/W)	Tim Brennan

GRAND PRIX DATES 2019

21st May	Sport City
15th June	Loughbrough
29th June	Watford
20th July	TBA
10th August	Trafford

www.britishmilersclub.com

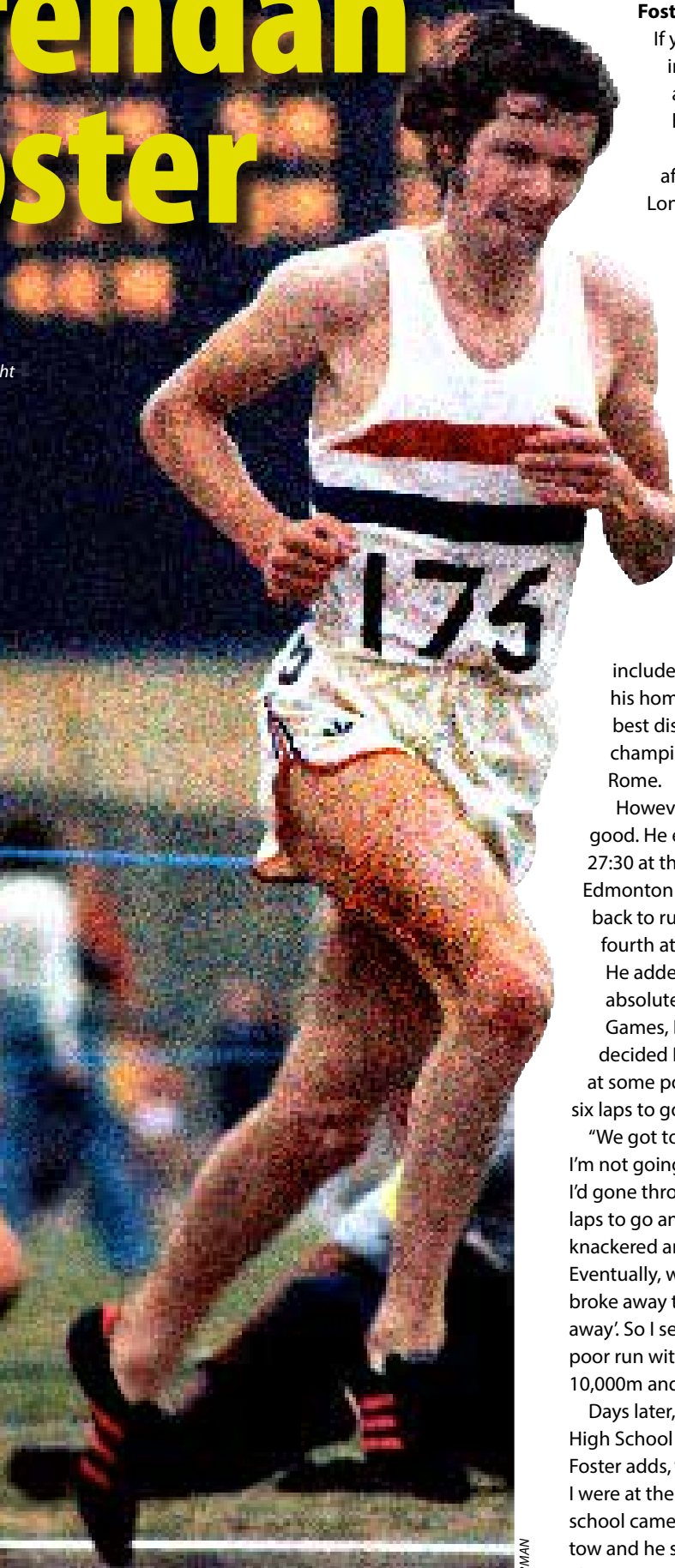
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[instagram.com/britishmilersclub](https://www.instagram.com/britishmilersclub)

Brendan Foster

Brendan in full flight in his heyday.



MARK SHEARMAN

British legend both on and off the track, Brendan Foster spoke to Simon Taylor

If you drew up a list of the most influential figures in world athletics over the past half-century, it's a safe bet that Brendan Foster would feature highly.

For 35 years, until hanging up his microphone after last summer's IAAF World Championships in London, the affable Geordie tones were the voice of BBC's coverage over nine summer Olympic Games and 16 World Championships, while inspiring a generation of Geordie's to take up running by organising the Great North Run.

Foster initially made his name through a glittering career spanning more than a decade at the highest level and earning him global medals, world records and national titles galore at every distance from 1500m to 10,000m. A stellar year in 1974, where he amassed a silver medal and UK record over 5000m in the Commonwealth Games in Christchurch as well as a British best when finishing 7th in one of the all-time great 1500m races. Also included in that year were a 3000m world record on his home track in Gateshead, before destroying the best distance runners in Europe, including Olympic champion Lasse Viren, to win the European 5000m in Rome.

However, 'Big Bren' suggests 1978 was every bit as good. He explained, "I was running really well." He ran 27:30 at the AAA Championships in June, before going to Edmonton for the Commonwealth Games before coming back to run his third fastest ever 10,000m when placing fourth at the European Championships in Prague. He added, "I'm not sure I've told this story, but it's absolutely true. There was a really strong field at those Games, Dick Quax, Mike McLeod and Mike Musyoki. I decided I was going to try and run away from the field at some point after halfway, probably with about five or six laps to go.

"We got to 5000m in around 14:08 and I thought 'Crikey, I'm not going very well, I should feel a lot better than this'. I'd gone through in 13:45 earlier in the year. We got to five laps to go and I thought 'right, I'll go now' but I was too knackered and so I hung on and was really struggling. Eventually, with three laps to go I kicked on again and broke away thinking, 'this is hurting, but at least I'm getting away'. So I secured the gold medal but thought it was a poor run with 28:13.65, it might have been my slowest ever 10,000m and I thought something must be wrong."

Days later, a chance meeting with a teacher from Calgary High School shed light on why he may have struggled. Foster adds, "Dave Moorcroft, who was my room-mate and I were at the warm-up track and a bunch of kids from the school came over for some autographs with their teacher in tow and he said, 'Great run! You beat the stadium record by about a minute, that's the best run we've ever seen at this altitude'. It turned out that Edmonton stands at over 2000 feet, but we didn't know that. I'd run 27:30 before it, ran the

28:13 and felt it was the hardest race I'd ever run, then a couple of weeks later, when I was knackered, I ran a 27:32."

That gold medal in Edmonton completed the Commonwealth 'set' for Foster after his surprise bronze over 1500m in 1970 at Meadowbank and that epic 5000m silver four years later. He reminisced, "The Commonwealth Games in 1970 was the most exciting race I ever ran because I'd never competed for Great Britain or England previously. The next one was my fastest ever 5000m and one of the great races, we ran the second and third fastest times in history."

Only three weeks after that gruelling 5000m/10,000m double in the searing heat and previously unconsidered altitude of Alberta (he added another bronze over 5000m behind the Kenyan duo of Henry Rono and 10,000m runner-up Mike Musyoki), Foster lined-up to contest the European final over the longer distance in Prague. He recalls, "That was a bigger challenge than I ever thought possible. I was running well, but I'd run the two 'fives' and a '10' only a few weeks ago, at altitude and then flown halfway around the world from Canada, got back into some light training and then headed out to compete in the 5000m and 10,000m."

The full extent of the effects became evident over the last half lap of the 10,000m. "It was comfortable for the first half," says Foster, "with a lap to go I had a chance to win it, in fact going down the back straight I thought I was going to win it then this big cheat from Finland, Martti Vainio, came flying past me and I thought 'who on earth is that?' I had never heard of him, and the reason for that was because he improved by over 30 seconds in that race. He'd never broken 28 minutes before and he ran 27:30! Once he passed me the race was over, I was just blown away and then two more went past in the home straight."

Vainio went on to take the silver medal in the 1984 Olympic Games before testing positive for the banned substance Metenolone and was stripped of his medal, allowing Mike McLeod to take his rightful silver. Being part of one of the fastest 10,000m races in history was scant consolation to Foster in finishing fourth. Foster conceded, "Doubling up was a mistake, ideally I would just have run the 10,000m in both. We didn't know enough about the recovery process"

In terms of his preparation, it would seem that his approach to training was also relatively straightforward. He says, "The winter was just rigid. All I ever did was 100



Coe and Foster together at the Great North Run.

to 120 miles a week and then once a week on a Tuesday night we'd meet at Gateshead Stadium and go out in a group where we'd run fast for a mile, then maybe keep going, have a couple of hard bursts, and then just run distance every day."

Foster continued, "In terms of racing, my last race of the winter would be the National 12-Stage Road Relay, where I usually ran pretty well and I always used to gauge the season by how fast I ran there. Then in April, probably, the first session I used to do, which I think might be of interest, was a 5000m or a 10,000m on my own, on the track with his coach, Stan Long timing me. I remember running a 13:40 one year and a 29:07 10,000m. I don't know where I got the idea from, but part of it was the mentality of running lap after lap. It was a hard session, you had to apply yourself and I would use them to see how well I felt I was running. In the summer, the thing I learned from Ian Stewart was you've got to keep the mileage going, so I always used to keep it around 100 miles a week."

A week's training in summer would basically break down to 20 mile on a Sunday with his team-mates including Charlie Spedding. A Monday would be 5 mile in the morning and 10 at night. Tuesday would be a five or a 10 in the morning then something like 10x400m in the evening. Wednesday would be another ten and Thursday after a five in the morning I'd do a grass session of 2x8x200m fast with a very short recovery.

Friday would be a couple of fives and Saturday would be the big session which was something like 3x1 mile or 6x800m. One of the sessions I used was sprint 50m then

coast 50m and just keep going. I once ran 13:37 for 5000m doing that. That became my go-to session, the one I would do as my last session before a big race. The week before Edmonton I ran 4:02 for a mile sprinting and coasting, I knew then I was ready."

Foster acknowledges the advances that have been made through greater understanding of sport science and strength and conditioning. Mo Farah has got that part of his preparation absolutely right, but he is clear on one thing. "I've talked to Haile Gebrselassie, Kenenisa Bekele and Mo about this, you don't become the best in the world by running 40 miles a week. They've all run 100-plus, so we weren't wrong about that!"

Has he retired altogether? He clarifies, "All I've done is retired from commentating, I'm still doing everything else I've always done." Foster's has his views on the current state of the sport in the UK. He says, "Over longer distances, Mo has put the icing on the cake. The problem is, underneath the icing there's not much cake. At 800m and 1500m I'm continually warmed by some of the performances of athletes such as Jake Wightman, Kyle Langford, Laura Muir and Laura Weightman. There seems a continual supply of good British middle-distance runners."

Foster is full of praise for the British Milers' Club. "I think for middle-distance running in the UK, the BMC is the jewel in the crown. It's been the leading organisation in furthering quality distance running in the UK for more than 50 years and the guys who run it are the heroes of the sport. For me, you can't praise the BMC too highly."

David Moorcroft

The golden room was a special and exclusive place as Matt Long found out

IT'S August 12, 1978 and the venue is Edmonton. The bell sounds as the clock shows 2min 39sec with just 400 metres to go in the 1978 Commonwealth Games 1500m final. BBC's David Coleman cannot contain himself, "There are four British athletes in the first five."

That quartet includes John Robson and Frank Clement from Scotland, Glen Grant from Wales and a 25-year-old from Coventry. All are in the shadow of the defending champion and world record

holder, Tanzania's Filbert Bayi. With 230 metres remaining the top five are beginning to gather themselves for the final drive and the ubiquitous Coleman senses that they may be unwittingly opening the door for the hard chasing and talented Kenyan, Wilson Waigwa. "And here comes Waigwa with a super-charged late run" he extols.

With 200m to go, Bayi is showing no signs of relinquishing his lead, but the iconic BBC legend observes, "Robson's digging in, in 2nd place where he's been all the time." As is his persona, Coleman becomes animated and yells into his

microphone, "Moorcroft on the outside for England." With the finishing line approaching Coleman asks the rhetorical, "Will he get the gold medal?" Within the blink of an eye, he replies, "Yes, is the answer!" The clock stops at 3:45.48 with Bayi just 11 hundredths of a second behind with Robson just behind Bayi.

Moorcroft's reflections of the race 40 years ago are still clear. "We had a strong British contingent in the middle distance events at those championships. England had Tim Hutchings and a young Steve Cram with Scotland having John Robson and Frank Clement who were a threat. Looking beyond the home nations, there were a host of famous faces it that race including Rod Dixon of New Zealand and of course the great Filbert Bayi. As a student at Loughborough University I was in awe of what he achieved in Christchurch four years earlier when he won a great race and broke the world record. The rumour going around was that Bayi was not quite as strong as he had been four years previously due to a bout of malaria."

At what point did he believe the gold medal may be a possibility? The Coventry man said, "I went into the championships thinking that I could medal, but it was my room-mate Brendan Foster who sharpened my focus somewhat in terms of winning. I distinctively remember my wife Linda being outside of the stadium before she took her seat and just as I was getting ready to warm-up I went over to her and told her, 'I think I can win the gold.'"

Moorcroft continues, "As for the race itself, to be fair I think Frank Clement actually finished faster than everybody else and John Robson was delighted to get a medal. If I'm honest there was very little in it and I saw an opportunity and knew I had to grab it."

After the race he recalls, "I remember being drug tested and leaving the stadium relatively late. I was on a high and turned down a lift back with my team mates, choosing to run back to the village. As I was running a local jogger appeared beside me and we got chatting. He asked me if I had been watching any of the Games and said what a great race the 1500m had been. I felt obliged to tell him that I had in fact been in the race and told him my name. The look on his face said it all and suddenly he was upping the pace. He was obviously trying to prove a point and it made me laugh that

David Moorcroft leads the 1982 European Champs 5000m. Eventual winner Thomas Wessinghage (289) on his outside.



MARK SHEARMAN

by the time I was approached the village we were striding out faster than my race pace earlier that day!"

Brendan Foster, his room-mate had won the 10,000m six days earlier and had a stuck a sign on their room door, 'Welcome to the golden room.' Moorcroft emphasised, "Living with Brendan meant he was able to help me make sure I didn't over-train. He was a positive influence. He kept gently reminding me, 'Remember the hard work has been done'. What he said resonated. Brendan had the knack of always being able to say the right thing at the right time."

Moorcroft became Chief Executive of British Athletic Federation in the late 1990s at a time when the finances of athletics in the UK were in a difficult situation. He said, "I took over in 1997 and it was a traumatic time for the sport. It represented a new challenge for me and I guess that out of adversity we created something more robust. We were lucky that Chris Chataway chaired it brilliantly in the interim period. It was exciting working with the likes of Alan Pascoe and our new sponsors and getting televised meetings and so on. Thanks to the likes of Max Jones as Performance Director and the hard work of people like Cherry Alexander, I'm proud of what we achieved. I think it's fair to say that we became organisationally more robust, but ultimately the success or failure of our sport has to be judged on the strength at all levels of athletics from grass-roots and clubs athletics, right the way through to the GB team."

Having left UK Athletics in 2007, I am keen to know how his company Point Four One is progressing. He describes the wide range of projects that they work on in the UK and abroad, not only in athletics, but in sports such as rugby league, cycling and triathlon, along with his partner, Rob Borthwick. He is ever keen to credit the role of Borthwick in this venture, telling me that, "after working on the planning for the 2017 World Championships in London, he's now involved in work on the Rugby League World Cup." As for himself, he brings us up to speed by saying, "After the London Olympics I was involved in the 'Join In Initiative' on volunteering which came about in part due to the work of the Cabinet Office and I've worked for Canadian TV for the last three Olympics."

The former 5000m world record holder reflects, "We have plenty of talent. Let's face it, it's a tough act to take over from the likes of Mo Farah, but even though it's inherently hard to win medals on the global stage, the toughness of Laura Muir is astonishing. She is as hard as nails when you consider she

was combining top-class athletics with her Veterinary studies."

He is the first to acknowledge just how much times have changed and acknowledges, "I was the product of another era in many ways. I mean Brendan worked during the 1970s. I managed to work as a school teacher and back then we were able to balance our running around our work. I was okay getting a few weeks off here and there when my running really needed it. I'm not sure you need to be a full-time athlete the whole year round. I realised that although I had my successes, that great performances may not stand you in good stead for the rest of your life. There is a life after athletics and it's good to keep a handle to some extent on the world of work."

Moorcroft believes the BMC is doing a

great job and helped Alex Bell to a sub-2 800m at Watford this year. The 65-year-old believes that in order to address the future, the BMC must revisit its past. With genuine affection he recalls, "I met Frank Horwill at a specialist event camp. Frank's attitude made me want to reach for the sky. Although Frank was not everybody's cup of tea, he was instrumental in teaching me that it's not just about being the best in Britain but it's about wanting to be the best in the world. It was the kind of attitude, 'Sod the rest of the world, we are better'."

ot"Frank exuded ambition, confidence and commitment. He was not dissimilar to my own great coach, John Anderson. John had so many qualities, not least of which he was a terrific motivator and the perfect coach for me. So in this sense, the challenge of the BMC is to re-ignite that spirit."

David Moorcroft enjoys another famous 3000m UK champs win.



MARK SHEARMAN

BMC Coaching Seminar

Foreword by Neville Taylor

The BMC Coaching Seminar, was held at the Trafford Stadium on 19th August, the day after a successful Trafford GP event.

Presentations were made by British Athletics Legend Liz Nuttall (McColgan) the 1991 World 10000m champion on her athletic career and move to coaching. Liz was, as expected, forceful and passionate.

She was especially candid and open about some of the mistakes she had made during her career, and how she had passed her own experiences into coaching athletes such as daughter Eilish.

Joining her was her husband John, a former British International endurance athlete and commonwealth bronze medalist in 1994, who discussed taking athletes to international level.

Dr Jess Piasecki (Coulson) delivered a very personal and scientific talk on the

importance of nutrition and its role in protecting physiological health in male and female athletes.

Jess, the 2012 European U23 Cross-Country Champion, was diagnosed with a compression fracture due to Osteoporosis in the early months of 2012. Her talk focused on how better information and guidance on the importance of nutritional quality and timing may help helped her to avoid this diagnosis.

Jess revealed how her own menstrual cycle only started at aged 27. She now works closely with coaches, parents, and athletes educating on the importance of the menstrual cycle and how it should not be an overlooked issue.

The day started with Dr. Richard Blagrove who gave a well detailed session on strength and conditioning and its role in maximising athletic performance, and injury prevention.

The morning ended with Bud Baldaro,



DAVID LOWES

and Norman Poole, who were engaging and informative in conversation discussing Buds illustrious coaching career.

Cassie Wood, who works with Manchester City FC, delivered an interactive afternoon presentation on "Matters of the Mind" covering the importance of positive thinking in developing the mindset of an athlete.

It was an extremely illuminating and informative day, we would like to thank all who attended and to Trafford AC for hosting us.

The importance of Strength and Conditioning to the Endurance Athlete

Dr Richard Blagrove by Paul Hayes

Dr Richard Blagrove speaks with authority on S & C work for the endurance athlete born of being a former middle-distance runner of high standard but also an international rower. He has spent many years both studying the impact of how S & C can improve performance while imparting his knowledge at places of excellence such as St Mary's University. He was recently the recipient of the Frank Horwill Scholarship, exploring the impact of S & C on the adolescent athlete.

He broke his talk down into 3 sections: How S & C work can improve endurance; How it can offset injury; and some exercises that that can support the above.

Firstly, he explored the areas of research that points toward to improvement of athlete performance through Strength and Conditioning, including his own Frank Horwill Scholarship work. He outlined the three elements in endurance performance as being VO2 Max, running economy and an athlete's lactate threshold. These impact the runner's velocity so ability to perform in distance races.

From past research, Richard shows that VO2 Max is not always the best indicator/predictor of performance but running

economy has a greater impact. A range of studies have shown that, by improving running economy through Strength and Conditioning, an athlete is able to increase their anaerobic capacity. Richard demonstrated a close relationship between improvement and the length of training time spent on S & C. Many studies show that there is a clearer need to periodise this work, building up from general conditioning to heavier resistance, explosive and plyometric work. In conclusion, studies show that there is clear evidence that S&C is vital for athlete improvement.

Richard then split his explanation into 4 areas: Movement Preparation (movement skills, landing skills, targeted activation and running/hurdle walk); Plyometrics and running drills (ankle activity, leg recovery drill, bilateral jumping, strides/sprints and hopping and bounding); Resistance training (Bilateral structure loading, Unilateral loading and Upper limb exercises); Tissue conditioning (Calf/Achilles complex, Gluteal, Hamstring and Trunk).

His research has shown that, although there are variables in all areas, there is a meaningful change to running economy, and thus performance, by exploring a structured approach to S&C. In a 20m



DAVID LOWES

sprint, this can result in an improvement of One tenth of a second, thus a gain of 2-8% in performance. This is achieved through the use of 2-3 sessions per week over a minimum of 3 months as part of a training program. There needs to be a gradual build up to resistance, explosive and plyometric work. When included in a program, the recommendation is a break of at least 24hrs between a hard-running session and a S&C session.

Richard then moved on to explore how S&C can dramatically reduce injury through the management of an athlete's workload. By gradually increasing the 4 areas shown above, the athlete is able to undertake progressively harder sessions to improve fitness, while recovering more quickly. Richard emphasised that this needs to be alongside sleep and recovery, good nutrition and listening to the body if pain develops.

As soon as the latter occurs, it needs to be investigated to minimise prolonged rest or restricted training. At the same time, a watch needs to be kept on movement or structure

deficiency to enable potential problems to be nipped in the bud. To reduce injury risk, focus needs to be on movement skills (completing each exercise correctly) while high load activities need to be low volume but with a gradual build up to the required level. To finish this section, Richard outlined to most common injuries that affect middle distance runners: The Achilles; stress fractures; the IT band; and plantar fascia.

To conclude, Richard then showed a number of the video clips that he has produced to illustrate exercises and drills which can be used in a S&C program. He has placed these on You Tube for coaches to download. Coupled with this is his excellent book: Strength and Conditioning for Endurance Running. Each phase is dealt with in depth with highlighted summary boxes to bullet point the focus of each

section. Alongside this are diagrams and photographs to further illustrate exercise and drills. Richard then provided examples of how athletes can be assessed before building a progressive program and examples of such programs. If you do not possess a copy, then I seriously suggest you get one as a constructive aid to building that an essential S&C program for your athletes this winter, and in the coming years.

Bud Baldaro in conversation with BMC President Norman Poole

By George Gandy

Mostly in tandem with his teaching career, Bud Baldaro has been the main driving force over best part of half a century for serial National Cross-Country and National Road Relays title winners.

Tipton Harriers and for the hugely productive endurance athletes' contingent at Birmingham University. Special mention was made of his personal coaching successes in events from 800 metres through to marathon.

Listed as foremost among Bud's all-time top personally-coached athletes were:

- Hannah England (1.59/4.01 for 800/1500m and 2nd in World Championships).
- Alison Lundy nee Leonard (2.00/4.08 at 800/1500m)
- Bev Hartigan nee Nicholson (2:00/4:05 for 800/1500m and medals in World Universities and Commonwealth Games).
- Adrian Passey (3:34/13.20 for 1500m/5000m)
- Eddie Wedderburn (8.18 at Steeplechase World Universities medallist)
- Hattie Dean (British Cross-Country stalwart and European Steeplechase medallist – PB 9.30)

Questioned regarding the biggest influences in his coaching career, Bud immediately selected Arthur Lydiard (the famous New Zealand coach who coached Peter Snell to 800m gold in Rome Olympics 1960 and 1500m gold in Tokyo 1964, Murray Halberg to 5000m gold in 1960, and Barry Magee to bronze in the 1960 Olympic marathon).

He then went to acknowledge other big influences closer to home, notably former National Endurance Coaches Harry Wilson (then the coach of Steve Ovett). Alan Storey (coach to Mike McLeod) and George Gandy (in respect of his circuit training regime as impacting on Sebastian Coe).

Norman Poole (himself a coach of many

internationals) asked Bud to expand on what he considered to be the main 'secrets' of his success. The Birmingham-based maestro outlined the following as of particular significance:

- Building a strong mileage base in winter (with reference being made to Brendan Foster having run 100 per week in the winter prior to his 4th place in the 1972 Olympic Games in Munich). For Bud's athletes in winter, typical weekly mileages would be: 60-70 miles for 800 metres athletes, 70-80 for 1500 metres, and up to 100 miles for the longer distances.
- maintaining base work as long as possible into the summer – in order to delay peak form until "the right time" with weekly mileages in non-racing weeks in summer typically as high as 50 in his 800 metres programs, and respectively 60 miles for 1500m, and 70-80 miles for the longer distances.
- Bud emphasised that his training plans for each athlete are prepared on holistic lines and tailored according to each individual's needs. During the reference to Brendan Foster it can be mentioned that he made the Olympic 1500m Final in 1972 whilst occasionally running 100 miles per week during the track season.
- Reference was made to Steve Ovett racing 4 or 5 times in just 11 days and then immediately topping the base-up with weeks of over 100 miles. Following the example of Harry Wilson in including lots of tempo work mixed with repetitions at different speed, for example a typical winter workout including 2k or 3k tempo, 8 hill reps, 2k tempo, 8 hill reps, and 1k tempo.
- As a key principle, employing several shorter tempo elements as thereby being able to do higher total volume of this type of running

Commending Paula Radcliffe and Grete Waitz as examples of outstanding athletes



DAVID LOWES

alternating workout days with 'recovery' days, Bud proceeded to describe a typical training week for his own athletes in winter, indicating:

Sunday	Long Run (also see later)
Monday	Short tempo run plus 4x2mins, 3x2mins, 2x2mins, 1x2mins
Tuesday	Recovery running
Wednesday	in park for fairly standard workout such as 8 x 1k reps
Thursday	Recovery running
Friday	Probably rest day (certainly for student athletes)
Saturday	Race or mix of Tempo/Hills/Track



MARK SHEARMAN

3:34 1500m man Adrian Passey.

Bud confirmed that some of his athletes used heart rate monitors, but stressed that athletes must listen to their own bodies and grow in their ability to make responsible judgments about pace, effort levels, and personal well-being.

Bud emphasised the importance for this process of a very gradual change from winter to summer workouts during April and May. Also, very relevant was the maintaining of some "links with speed" during winter, such as doing 2 x 300 or one 400 shortly after finishing a session like 8x1000m.

Typical sessions for April/May by Bud's groups were specified as:

- 800, 600, 400, 200, (1min)
- 400 (2mins), 600, (5mins), 600, (2mins), 400, (1min), 200

- 3-4 sets of (1000m@3k pace, short recovery, 500m@1500 pace
- Bud highlighted the need to provide personal support appropriate for leading individual athletes, as required.

Use of 'speed drills' for better/stronger posture and co-ordination, use of circuit training and weight training (particularly dead lifts, bench press, and lunges).

The specific purpose(s) of the mixed-terrain/mixed-pace sessions, different approaches to the weekly long run (such as division into long/slow/steady or slow/steady/faster section).

Two weeks break from running after the summer season (followed by a careful easing back into the winter program), and with ('happy' for some maybe?) a mini-

break around Christmas.

Thus, ended an enlightening, fascinating and, undoubtedly inspirational contribution to the day's proceedings, skilfully thank you Norman) drawing on the vast knowledge, experience and views of one of Britain's most charismatic and enduringly successful coaches over several decades.



DAVID LOWES

Liz Nuttall – Competitor to Coach

Liz Nuttall – The 91 World 10000m Champion reflects on her career and her life as a coach.

BRITISH legend, Liz Nuttall (née McColgan) presented an enlightening talk on her career, training, injury and coaching along with her daughter Elish McColgan, the 2018 European 5000m silver medallist writes DAVID LOWES.

Incredibly, she began by saying that this was the first time she had been invited anywhere to talk about her career. The first point she made was that what she did as an athlete may not have been the right way for many, but it worked for her and importantly she admitted that many mistakes were made along her journey to success.

The world 10,000m champion from 1991 started out at the age of 12 through PE at school and her first love was the high jump, although she took part in everything possible and was fairly good at most things, but never stuck at any one thing long enough. Nuttall was captain of the school hockey, netball and volleyball teams and found out quickly that sprinting was not her forte, but that longer distance running was through her ability to keep going. She was first coached by Harry Bennett and after his death she went through a period of being self-coached before John Anderson took over the duties from 1987-89. Another spell of self-coaching followed and then in 1992 the great Grete Waitz guided her progress until 1996.

It was in 1982 that she gained her first Scottish senior vest at the World Cross in Rome where she finished 71st. A year later aged 17, she went off to the US on a scholarship. She had previously been working in a jute factory commencing the

working day at 6am and finishing at 5pm. The system across the pond gave her the support to be a full-time athlete and her first visit to altitude was in Idaho at 8000 feet. Even then she was running 90-100 miles a week and this propelled her to win all the national titles at cross country and track. People were taking notice of the young Scot and she was recruited to the University of Alabama in Tuscaloosca after a year and she won the NCAA indoor mile championship. It was also where she was introduced to the road racing circuit.

By 1986 she was British champion at 10,000m where she lapped everyone and her first major title came in the Commonwealth Games in Edinburgh at the age of 22. She had a set-back in the European Championships in Stuttgart, where she finished 5th in the 3000m and 7th in the 10,000m - both unplanned outings and where she was almost forced to run by the team management, much to her disgust! The following year at the World Cross in Warsaw she claimed a silver medal and this coincided with the last time Scotland competed in the event as from then on it would be Team GB. On the track that same year (1987) she finished 5th at the World Championships in Rome clocking a British record of 31:19.82.

She went even faster in the 1988 Olympic Games in Seoul clocking 31:08.44, a performance which clinched a silver medal behind Olga Bondarenko. Things were going extremely well now and in 1989 another silver medal, courtesy of the World Indoors in Budapest, this time over 3000m. The Commonwealth's came around again in 1990 in Auckland and she retained her



DAVID LOWES

title over 10,000m and added a bronze over 3000m. 1991 was going to be a special year and it started with a bronze at the World Cross in Antwerp before winning the World title in Tokyo over 10,000m after earlier setting a PB in a solo run in Hengolo stopping the clock at 30:57.07. The year wasn't finished though and she accepted an invite to the prestigious New York Marathon and came up trumps again clocking a satisfactory 2:27:32. She later admitted that she never trained for cross country and ran mostly on the roads and when it came to mud, she regularly struggled.

1992 was a mixed year, but still with plenty to savour. After finishing a disappointing 41st at the World Cross in Boston, a week later she set a world best for 8k. The Barcelona Olympics saw a 5th placing over 10,000m before putting some icing on the cake with victories at the World half-marathon as part of the Great North Run (68:53) and then the Tokyo Marathon (2:27:38). The following year saw a 5th place at the World Cross in Amorebieta and a 3rd place at the London Marathon (2:29:37). Unfortunately, a knee injury put paid to her progress with a time-out for almost two years.

However, you can't keep a good thing down for too long and some top performances were just around the corner. In 1995 a London Marathon 5th placing (2:31:14) and on a 140 mpw regime was

followed by a 6th place at the World Championships 10,000m in Gothenburg (31:40.14). Fast forward another year and a London Marathon win (2:27:54) was followed by a disappointing Atlanta Olympics 16th finish over the classic distance and two London Marathon runner-up spots in 1997 (2:26:52) and 1998 (2:26:54) signalled what seemed like the end of an illustrious career after an operation was required. She started coaching in 1997 and her daughter in 2003 when she was 12. That same year she was elected chairperson for Scottish Athletics and yet still managed to resurrect some running form to capture the Scottish Indoor 3000m and Cross Country titles. This was the point where she retired again.

A look at her World Championship 10,000m gold medal winning training revealed the following:

12 Days before race

am 3 miles

pm 6x800m off 60sec in 2:15

am 8 miles in park in 49min

pm 3 miles in 18min

am 12x400m off 100m (30sec) in 66sec – 100% humidity. Followed by 6x100m accelerations

am 5min 30min 30sec

pm 5 miles 33min

am 10 miles very easy in 62min

am 7x2min off 60sec in park

pm 3 miles easy jog

am 5 miles easy in 33min

pm 3 miles easy in 21min

am 3 miles jog

am World 10,000m heats 31:54

am 3 miles jog

am 3 miles jog

pm jog and strides

pm World 10,000m final

31:14 – World Champion!

Interestingly, she ran one tempo session a week and always on a treadmill to maintain rhythm. Mondays would be a 10k run and in 1982 these would be around 35min pace and by 1991 they would be sub-32min and all with the same heart rate. A Friday would see another tempo run in the winter of 5k if she was not racing. Her mileage progression at the ages of 21-24 years was 90-100mpw and from the ages of 25-30 it revolved around weeks of 105-140mpw.

A glance at her marathon sessions shows some mouth-watering workouts and her last long run would be three weeks before a race and she only ran 22 miles once in the build-up. Key sessions were 10x800m hill with drive

back down in car reducing recovery to 60-75sec; 10x1 mile in 4:50-4:55 off a 60sec rec; 10ml Tempo on treadmill at a 1% gradient at 5:10 pace and with an average HR of 164bpm.

Her coaching started like everyone else at grassroots level with her club Dundee Hawkhill Harriers in 2003. Her coaching CV includes: Collette Fagan, European Junior 5000m bronze; Colin McCourt, European Cup gold 1500m; Sarah Kelly, World Junior 800m finalist; Lynsey Sharp, Commonwealth Youth 800m bronze and add to that list Morag McClarity, Graeme Oudney, Alyson Dixon and Lily Partridge.

For endurance talent, the Scot felt that it needed to be identified early and that lifestyle was conducive to progress. She believed that we expect our talented youngsters to step up to senior level seamlessly, yet it is almost forced upon us that we do not expect them to work hard on endurance in their younger years and the inevitable happens with breakdown and injury. Nuttall said, "Howw can it be possible to run high mileage when they have no building blocks behind them and no consistency?" The Africans cover miles from a very early age, either walking or running, and have much more in the bank when it comes to stepping up distances and with a much stronger cardiovascular system.

Nearing the end of her presentation she made it clear that there needed to be a clear and precise pathway to performance with consistency and balance key factors along with transition periods and importantly the confidence to back off when the main work is done. Any programme had to be workable and sustainable.

For success at the highest level the famously gritty Scot made it clear that there was a need to train regularly at altitude with



Liz Nuttall en-route to 1988 Olympic 10,000m silver in Seoul.

a balanced training and racing programme in place. She was an advocate of strength and conditioning and stressed that there was no magic formula, just hard work with a logical plan and consistency. Nuttall added, "Elish trains regularly at altitude camps and suggests more have to buy in to this programme. In an ideal world, the best scenario would be to sleep high and train low all year round and of course, there are some who just don't respond to altitude at all."

Finishing the intriguing overview, Nuttall made special reference to the Athlete/Coach relationship. She encouraged athletes to ask questions about the training plan and that the coach should always have the answers! Any partnership should be athlete driven and coach led with science supported. Her parting shot was simple, have honesty in your delivery and a belief in your athletes.



Eilish McColgan European 5000m silver in Berlin.

Taking Athletes to International Level

John Nuttall – David Lowes



DAVID LOWES

FOLLOWING on from his wife Liz, John Nuttall based his presentation on "Taking Athletes to International Level". The couple, who have lived in Doha, Qatar for a number of years have formed a formidable team with a wealth of knowledge and experience at the highest-level writes DAVID LOWES.

The audience's attention was caught from the very first slide of Nuttall's presentation. It gave a stark, but nonetheless clear message, that 67% of athletes who competed for GB at the World Junior championships from 1998 to 2012 never went on to compete for their country at a major senior championship. Even more remarkable was the fact that 63% of them would never even set a PB as a senior athlete. These were extremely sobering facts and gave the audience much to ponder.

Next up, the former Preston Harrier offered a pie chart, "Life and Training Components" which showed just some of the many things that needed to be considered along the pathway to senior success and these included: training, strength and conditioning, drills, rest, work, social, nutrition and competitions and each was as important as the next in many respects.

The former 13:16.70 5000m athlete who also boasts a 7:36.40 3000m best along with a 3:58.83 mile and who competed at the 1996 Atlanta Olympic Games and twice at the World Championships as well as five times at the World Cross has a bronze medal from the 1994 Commonwealth Games in Victoria and a silver medal from the same year at the World Cup in London.

His next slide then showed his "Personal Athlete and Coaching Influences" and this gave a brief overview of how he started and how he came to his current roles. As with any other youngster, school was pivotal as was his club in North West England as well as the BMC and English Schools championships. He became a GB senior athlete in 1991 and enjoyed success until 2000. He then became a coach at Preston

and then a UKA Performance Coach from 2000-13.

Over recent years he has been Head Coach at the Aspire Academy in Doha which is an unbelievable futuristic building with everything and more included in the venue. He currently has his own business running Athletic Zones in the Qatari capital. Significantly, he won the English Schools' 3000m title in 1985 in a Championship best performance (8:10.5), a record which still stands today and in that same year he clinched a bronze at the European Junior championships.

For success to happen, he stressed that much patience is needed and building strong foundations that will ensure smooth transitions with the relevant checks and balances to avoid the crash and burn approach and this would allow peak performances and at a higher level. The need to identify training phases and knowing what they are, how many and when to implement them was seen to be vital as was the necessity to cut-out the guess work and wasted training and effort.

Nuttall then talked about "Junior International Athletes" and he emphasised that they should be doing lower volumes of training; higher intensity of training; the need to be coach and athlete centred; very little strength and conditioning with more education and a focus on core and development; lots of racing and a less rigid plan compared to senior athletes.

The Lancashire man who went to Iowa State University and who was extremely successful when there amassing a NCAA Division 1 cross country title, eight Big Eight Conferences titles and runner-up spot at the NCAA Indoor championships. He was inducted into the school's hall of fame in 2001. He then discussed why athletes should consider a US educational/training set-up.

He put forward the following points that he thought were essential to reach a higher level: a good training group along with services of a full-time coach; excellent educational opportunities; physiotherapy support; physiology support; strength and conditioning support; excellent racing opportunities. On top of those he said that the team approach to maximise marginal gains was a big selling point.

Those marginal gains for reaching success were further sub-divided into bullet points: good planning; identifying key sessions; S&C support; technical input; help with psychology, nutrition and physiology; profiling Power of 10; altitude training; set

SMART goals.

In terms of planning he was keen on the following phases: rehabilitation; build-up; general preparation; pre-competition; competition. These are what are generally accepted but many phases can be ignored or watered down with poor results further down the line.

He then gave some key sessions that he used to do in his competition phase and these made some interesting and valid points as to what is needed to be successful. He did 7:36 and 13:16 off these workouts.

- 15x400m in 58/9sec off 1min
- 5x1km in 2:35 off 90sec
- 1600m/1200m/800m/400m in 4:12, 3:06, 2:02, 55sec off 3min
- 8x800m in 2:04 off 1min

He finished off the presentation with a reminder of the requirements of the physiology of running for events ranging from 800m to marathon with four systems highlighted and the percentage at which they were achieved: economy, lactate threshold, VO2 max, anaerobic. This was a constant reminder for athletes and coaches alike to plan their specific and general workouts so that maximum gains could be made.



MARK SHEARMAN

John Nuttall – World Champs 1995.

Nutrition in numbers

Dr Jess Piasecki – The Importance of Nutrition for Athletes



DAVID LOWES

The recommendations made are based on body weight. For young athletes who are training, still growing and in school it would be suggested to have 5-7g/kg of body weight of carbohydrates. E.g. for a female of 55kg this is around 92g of Carbohydrates per meal.

Protein would be around 1.2-1.6g/kg of body weight which is around 22-25g of protein per meal.

When looking for carbohydrates aim for low GI foods for a slow release of energy, whilst enjoying everything in moderation. Protein becomes more necessary with increasing intensity and can contribute to 1-6% of energy availability as well repairing muscles after use.

The timing of our nutritional intake is very important. 30 mins post exercise we should be having a recovery snack that is 3:1 on carbohydrates to protein. We should also be eating every three hours throughout the day, too much of a gap between meals increases cortisol levels which affects recovery as well as menstrual cycles and bone turnover.

Sleep can also affect our bone health and recovery, when sleeping and resting we allow our bodies to produce growth hormone that is able to repair damaged muscles. Recent studies have shown athletes having a greater amount of sleep are also associated with having stronger, denser bones.

The monthly cycles

The menstrual cycle is a natural process for females, occurring monthly, and is essential to maintain bone health and fertility. It can start from the age of 12 and continues until the onset of menopause around the age of 49-52. The cycle occurs over a period of 28 days. The first 14 days are known as the follicular phase. During this phase, around day 10, the hormones oestrogen, LH (luteinizing hormone) and FSH (follicular stimulating hormone) rise, reaching their peak around day 14. LH reaches a level

double that of both oestrogen and FSH. After day 14 LH levels rapidly drop off while oestrogen and FSH fall off more slowly, over a 5-day period. The second 14 days are 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.

The cycle then repeats and continues into the next 28-day cycle. Body temperature also fluctuates during the cycle and rises by around 1-1.5 degrees Celsius during the luteal phase. LH is also linked with appetite and so the rise and fall can cause the female to feel hungrier during this time period. Oestrogen is a key regulator of bone resorption, without oestrogen there would be an excess of bone being broken down over new bone being formed, making the menstrual cycle an essential tool in maintaining bone structure.

Bone stability and structure

Bone remains in a state of constant turnover by two types of bone cells; osteoblasts and osteoclasts. (Fig 1). Osteoblasts are involved in bone formation, whereas osteoclasts are involved in bone resorption. The balance between these two types of cells is vital to maintain a steady state of bone health. Bone resorption occurs at a much higher rate than formation; bone resorption takes just 30 days whereas the bone remodelling cycle takes 4 months. Therefore, a slight imbalance can lead to a bone fracture very quickly.

Bone also responds to physical activity and impact. The mechanistic theory describes how the mechanical strain on the bone, caused by muscle forces

during contraction, activates the surface osteoblasts which begin the process of forming new bone.

Continued activity causes an increase in bone mass, size, and strength, while reduced mechanical deformation causes a decrease. During puberty, bone is most responsive to physical activity so this period of life is 'the window of opportunity' to increase bone cross-sectional area and density. There is evidence to show that the bone mineral content of people who were active during childhood is around 8-10% greater than those that were not, even if they are both active later on in life.

More is not always better..

Elite athletes, particularly those involved in sports that usually adopt a leaner physique with low body fat, are at a greater risk of disordered eating; they are more likely to disturb the balance between optimal health and recovery by reducing energy intake. Some population studies of high-level female athletes have shown up to 50% of the athletes demonstrate one or more disordered eating behaviours.

The reasons for this disordered eating could be external pressures from teams, coaches and sponsors, or the athletes themselves having the belief that the leaner and lighter they are, the quicker they will be. These pressures may also cause the athlete to push their body to further extremes. By making it difficult to match energy expenditure with energy intake, they unintentionally end up with an energy deficit. Once the athlete reaches a level of negative energy balance, detrimental effects begin to take place.

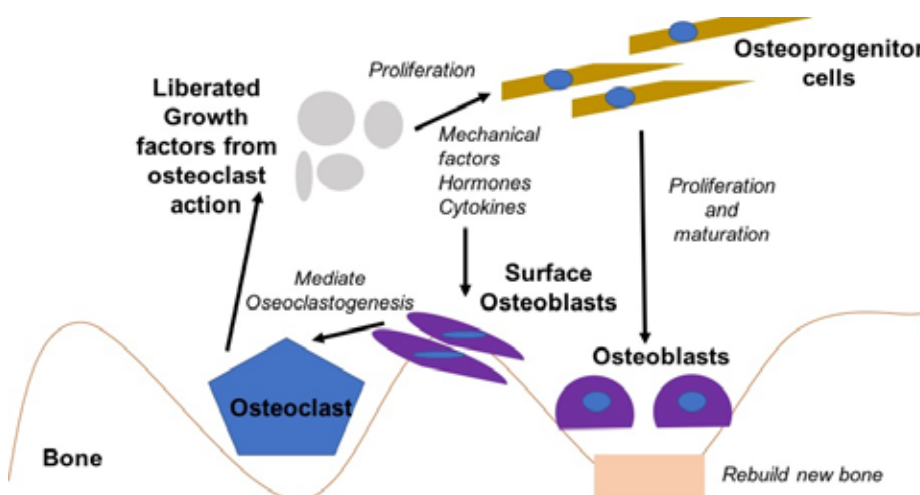


Figure 1: An adaption to show the balance between osteoblasts and osteoclasts to maintain bone health

High Risk; no start	Moderate Risk; caution	Low risk; go
<ul style="list-style-type: none"> ● Serious eating disorders ● Other serious Psychological and physiological conditions associated with low EA ● Extreme weight loss techniques 	<ul style="list-style-type: none"> ● Prolonged low % body fat ● Substantial weight loss within short time frame ● Attenuation of expected growth and development ● Abnormal menstrual cycle ● Menarche after age 16 ● Abnormal hormone profile in males ● Reduced BMD ● History of stress fractures ● Lack of progress ● Energy deficiency 	<ul style="list-style-type: none"> ● Healthy eating habits with appropriate energy availability ● Normal hormonal and metabolic function ● Healthy BMD ● Healthy musculoskeletal system

Table 2: Return to play guidelines; as suggested by the IOC consensus statement (Mountjoy et al., 2014).

The reduced intake will not only cause weight loss but, with a lack of energy, the liver will begin to release more ketone bodies. Ketone bodies are water soluble molecules that ae released from the break-down of fatty acids, which are used as the main energy source when there is a low energy availability. A build-up of these ketones can cause the blood pH to reduce to dangerously acidic levels, a process known as ketoacidosis. Muscles will become weaker as the body starts to preserve the small amount of energy it has been given, heightening risk of injury.

Without the necessary energy intake, the menstrual cycle will most likely become irregular and eventually cease, which is known as amenorrhea. Amenorrhea is as prevalent as 65% in distance runners and 69% in professional ballet dancers. Without a regular menstrual cycle the levels of oestrogen are significantly reduced, which causes a disproportionate level of osteoblasts and osteoclasts, leaving a higher rate of bone resorption than formation. This may ultimately lead to bone injuries, osteopenia, or even osteoporosis at a very

young age, making any further career achievements even more difficult.

These three symptoms (disordered eating, amenorrhea and osteoporosis) became more prevalent in the 1990s and were termed ‘The Female Athlete Triad’ in 1997 by the American College of Sports Medicine. Athletes may only present with one or two of the components but this does not mean they cannot be diagnosed with the triad. It has been estimated that only 50% of trained physicians are knowledgeable about the female athlete triad and are comfortable diagnosing and treating the condition. More recently the triad has been encompassed within a new term; RED-S (Relative energy deficiency sport). This was defined by the international Olympic committee in 2014.

This new title is due to an increased number of patients presenting with various other physiological symptoms (chronic fatigue, irritability, depression, long-term fertility issues, reduced immunity and reduced metabolic rate). RED-S is deemed to result from a prolonged low energy availability disrupting numerous physiological systems, such as, but not

limited to, cardiovascular, gastrointestinal, endocrine and renal systems. Redefining the RED-S also allows male athletes who present with similar issues to be included. The IOC developed a return to play model to be used by all physios/coaches and team leaders when dealing with RED-S issues. See table 1 and Figure 2.

The oral contraceptive pill will cause a ‘withdrawal bleed’ however, this is not the same as a natural menstrual cycle. The pill may give a perception that everything is ‘okay’ and functioning, however it prevents natural oestrogen and therefore the ability to build new bone is lost. Menstrual cycles are a natural process and they need to be maintained as much as possible. If you are not having menstrual cycles and have been recommended the pill. would suggest working on increasing your energy availability before taking any medication.

More research is being conducted to better understand the issues, and accurate diagnosis will hopefully become more frequent. But what we really need is education at a young age, as most athletes become familiar with the triad only once they have been diagnosed with a bone injury. Prior to this, they may have never known why their menstrual cycle stopped, or why they were frequently injured/ill as it can be seen as a ‘normal’ thing to some when training at such a high level.

If athletes are made aware of the symptoms and issues around the triad and poor nutrition before they occur, then nutrition and menstrual cycles can be more closely monitored as they progress through their athletic careers. Whilst we may still have new findings that need to be discovered within research, what we can do now is use the information we have to educate athletes (males and females) and their support networks.

I hope this article and presentation has provided a sense of awareness and



Jess Coulson in 10,000m action at Highgate.

MARK SHEARMAN

understanding about this topic. Jess can be contacted for further enquiries on runscienceltd@gmail.com, www.runscience.co.uk, twitter: @runscienceltd.

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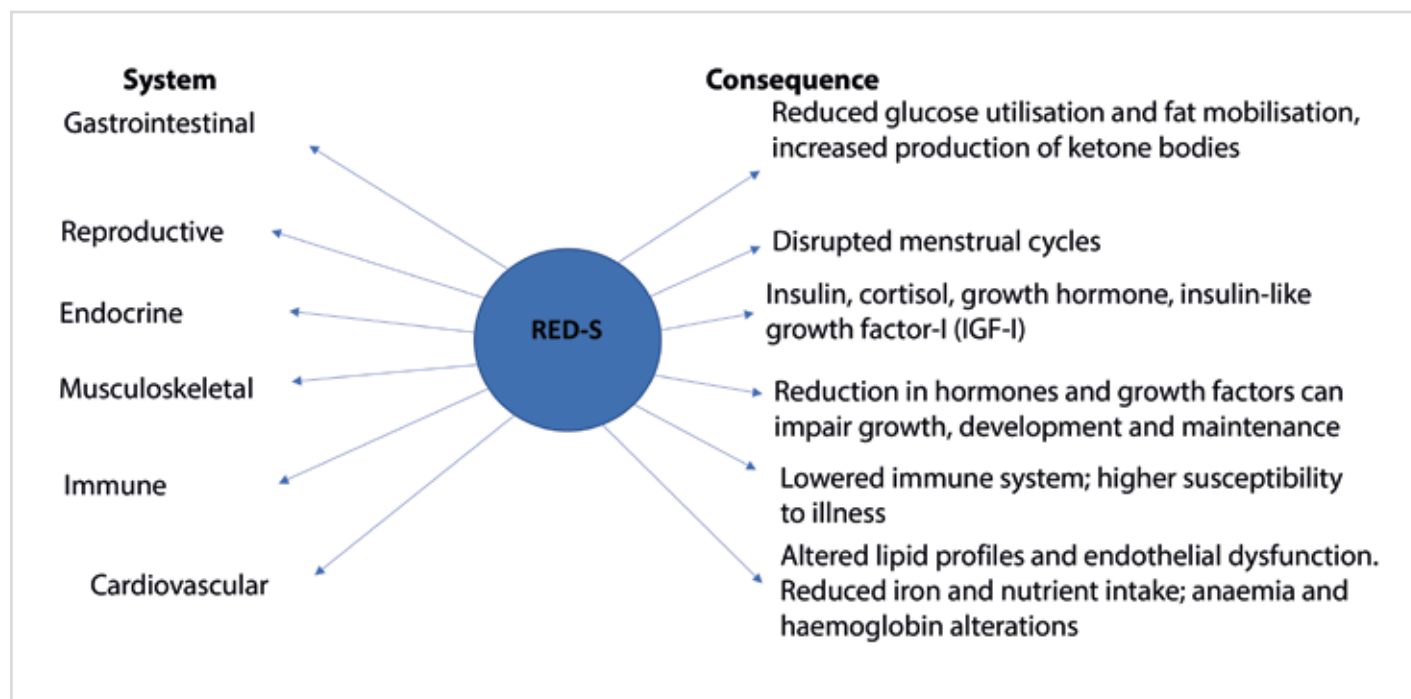


Figure 2: Physiological impairments associated with RED-S (Mountjoy et al., 2014)

Matters of the mind

Cassie Wood by Neville Taylor



The final session was delivered by Cassie Wood, who works with Manchester City FC.

Cassie was able to stimulate the coaches into thinking about the importance of the mind in preparation to compete in races

By using practical examples, with all involved, she was able to cover the importance of "positive thinking"

"YES YOU CAN" a simple yet effective message that can add to motivation.

Pushing negative thoughts away, Cassie explained were key to maximising athletic performance.

Coaches were questioned on the percentage of time they devoted to the physical, technical and psychological in preparation of their athletes. The answer may be two-fold in that coaches are continually using psychological techniques to motivate their runners; however, some may focus on the physical and measurable aspects such as time at

the expense of such preparation.

Coaches were also asked assess their own level of confidence and positive attitudes, and how this may reflect on the athletes they work with.

It was emphasized that being positive resulted in better performances all round.

Observing the body language of the audience indicated the need, and wish, to widen their knowledge of Sports Psychology. There is a wide range of publications available for this purpose.

This was a short, well received, presentation a taster on such an important subject. Coaches were encouraged to enhance their knowledge for practical application.

Competitive Edge

*Jake Shelley wins the Trafford GP
5000m from Jack Crabtree.*

DAVID LOWES



To reach optimum performance requires high levels of specific fitness in all sports and sometimes it takes a little more writes David Lowes

COACHES and sports people always talk about fitness and detailed workouts that have propelled them to fantastic performances. There is no doubt that these things are needed in abundance and over a constant period of time to ensure success. For some this may be months, but for most this time-scale may amount to years of persistent and consistent toil.

Although training and relevant gym-based sessions are the 'bread and butter' criteria, there are of course many more essentials that form part of the jigsaw that will give the athlete an excellent chance of achieving their targets. These may include nutrition, recovery and recuperation, mobility, general strength, plyometric strength, good economy and biomechanics along with a strong mind-set and the list is seemingly endless. Think of it as a big jigsaw, with each piece as important as any other – miss one and the end result cannot be reached.

Once training has gone well and accumulated all of the above ingredients, what could possibly go wrong? The answer

is much and the eternal answer is always why? Tears are shed and tantrums can be seen and although these are natural emotions, it still doesn't address why the desired result wasn't achieved.

Different sports evoke different passions and it is visually easy to see these almost every day courtesy of television or associated media channels. All sports cannot have the same level of outward showings of emotion or aggression. Tennis players often have a rant on court, golfers roll their eyes and heads drop after an errant shot and then there's footballers - enough said! Why do people react in such a way after a poor shot or performance? Simply, it's usually because they have trained so hard and long for excellence, or their version of it and anything less than that irritates them to the point of anger. Those that handle their inner feelings better than others will always have a higher chance of doing what they set out to do.

In terms of athletics, it is evident that some 'controlled' aggression or even anger and a high arousal state at the right time can be the difference between a great performance and just a good one. It is sometimes termed the "warrior mentality". A look at the running events and it is clear that the shorter the event the more some form of explosive

inner aggression is needed to get from A to B. Sprinting obviously requires controlled emotions, although sometimes pre-race sprinters can appear agitated with verbal and physical passions being very evident.

Moving up the scale and a 1500m runner may not need to get into this 'higher' state of mind and body until the sound of the bell or until the finish line is in sight. A Marathon runner may not get too into this level of high arousal at all, but may need to summon some high levels of aggression when the body is saying "I can't do this". The same goes for cross country when the mud begins to dictate what the legs are capable of or not. The horizontal jumps require an explosion on and off the board, while all of the throws need an injection or even an outburst of aggression at the time of release of the implement. I'm sure everyone is aware that many throwers let out a loud exclamation upon release and keep that going until it hurtles to the ground. Is this really needed? They definitely think so!

How many times have we seen the eventual winner in a middle-distance race appear to be struggling to keep pace with the relaxed front runners? When the bell sounds or at a specific point it seems that this is the cue to change from cruise pace

to sprinting and their demeanour changes almost immediately. In effect, this is what many runners do, the start and middle segments of the race are deemed almost unnecessary and they may well find it hard to focus as their minds are focussed on a trigger point where they go into overdrive. It may be deemed a phenomenon, but it is reality nevertheless and once adrenalin kicks in, anything is possible.

In terms of aggression and the cues needed to succeed, sometimes things in the past can have a bearing. Frank Shorter the 1972 Olympic Marathon champion who was subjected to abuse as a child said: "I found out that as long as I knew the pain is coming and you have an idea of how bad it is going to be and how long it is going to last, you develop an ability to ride it out. And I think in a way it may have transferred a little bit over into my running." (*How Bad Do You Want It? Matt Fitzgerald*).

Another unusual example was that of 1964 Olympic steeplechase gold medallist, Gaston Roelants. In a twilight race that he ran from the front, he could see the shadow of a competitor just off his shoulder. He ran with fear and ran harder to get rid of the shadow, but to no avail. It wasn't until he finished that he realised it was his own shadow - yes, he was terrified of his own reflection!

In a study in the *Journal of Psychosomatic Research* the subjects' pain tolerance was significantly greater when they were aggressive. In a hand-grip strength test, the results were significantly better when anger was induced. Before I go any further, please note, it is not the intention to make everyone a nasty and aggressive person. Far from it, it's more a matter of engaging some form of anger or emotion at the right time to explode away from the pack over the final 200m of a 10,000m just like Sir Mo Farah. It's having that ability to flick a switch in a race to change the gears very quickly under ever increasing levels of fatigue. Sport and emotions go hand-in-hand and an injection of adrenalin into the bloodstream can be like rocket fuel!

Sometimes, it is a matter of something being said in a derogatory way by a competitor or even on social media that fires up the emotions of an athlete. Let's be brutally honest here, there are some people (competitors) that you like and some you just dislike. Once on the start-line, I would suggest everyone is your enemy, and that is just the way it is. If you accidentally elbow someone mid-race, is it best practice to say "sorry" and give them some space or should you hold your ground and wait until you are finished? I know what I would do!

Things that are said out of context can



Jess Judd digs in to get the better of Amy Griffiths with a SB of 4:07.50 in the Trafford GP metric mile.

PETER BROWN

affect different athletes in different ways. Some will have a "deaf ear" and ignore it to a point and others will take it personally and that usually means it will have a derogatory effect on performance or for the strong-willed it can be just the catalyst they need to succeed. Although not regarded as best coaching practice, some athletes need to be treated gently while others respond significantly to some constructive criticism and the odd educated rant. Coaches beware, know your athlete and their personality traits. It can make your training ethos so much easier - everyone is definitely not made the same!

A term often bandied about is being "in the zone" and it is a place where you are in control, relaxed and probably doing it subconsciously. Sometimes a two-hour run seems to take just that or outwardly much longer, yet some days those couple of hours seem like half the actual time. Emotions generally incite three types of responses and these are physiological, cognitive and behavioural. Positive and negative emotions create high arousal and the outcomes are joy, anger, hate, frustration and excitement.

The cardiovascular system jumps into action when aroused and often the body's reaction is out of control. The body is

operating on action and not thought and this goes some way to explaining why you have a good performance without apparent effort. You can't press a button to produce endorphins on command, but you can urge yourself to get in this state by thinking of past events that have caused frustration or joy. There is no guarantee that these thoughts will set off a trigger, but it can help enormously.

It is often said that those who have been in "the zone" don't remember certain phases in a race. They have been so focussed and "pumped up" that their actions have been almost autonomous. On the flipside, a disastrous performance and every step can usually be recounted with even the faces of some spectators such is the lack of focus with the mind being anywhere but where it should be.

You may not need to be outwardly aggressive, but if you want to win something in a close finish then you had better get some adrenaline flowing - it's up to you how you bottle it and release the cork at the right time.

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

High performance training

St Mary's University in Twickenham, south-west London was visited by Brendon Byrne this summer to see what makes it really tick.

The track is now aptly named after Sir Mo Farah and it has been said that he has probably run more laps there than anywhere else as a former student when coached by Alan Storey. Former students include internationally renowned coach George Gandy, Olympian John Bicourt, endurance legends Dave Bedford and Gordon Pirie, plus throws coach John Hillier to name but only a few.

As an EPACC (Endurance, Performance and Coaching Centre) the early finance came from UK Athletics, London Marathon and St Mary's. Currently it is financed by the London Marathon and the university. The high performance idea started in 2002 with former international athlete James McIlroy and then Mo Farah. The middle and long distance centre has expanded considerably over the years and the athletes who attend have to pay their own fees as well as some of the cost of the high altitude spring training camp at Font Romeu in the Pyrenees.

To be accepted at St. Mary's you need to be a promising or high performing athlete along with the academic qualifications. Around 30 athletes a year are taken on courses and have accommodation provided for them on the campus. They then have the opportunity to train with others of a similar standard from club to international standard.

On the day of my visit the track was crowded with athletes, many of whom were internationals. Andy Vernon was completing a session, Steph Twell had a session with Geoff Wightman and Shelayna Oskan-Clarke was training also. Elliot Giles and Kyle Langford were getting ready as well. The BMC's Neville Taylor was another of the well known coaches at the track that day.

The chief coaches are Mick Woods and Craig Winrow and they are also assisted by Rowan Axe, a 3:38 1500m runner. Mick has been employed as a coach since 2005 and Craig since 2007. Generally track sessions take place on Tuesdays, Thursdays and Saturdays in the spring/summer period. During the winter period it was sometimes the case that Winrow would supervise sessions with the aid of his bike in Bushy Park.

Winrow gave me a conducted tour of the facilities and it was no surprise to learn



Mo Farah – a famous alumni of St Mary's.

that one of the courses on offer is a degree in strength and conditioning. They have an environmental chamber which can be used to simulate altitude and hot conditions. As well as track and field, the facility has been used by Formula 1 racing drivers in their preparation.

The coaches room has a great collection of photographs on the wall. Incredibly, eight athletes were selected for the Olympics in 2008, 11 in 2012 and 10 in 2016. Sixteen athletes went to the Commonwealth Games this year and nine were at the 2017 World Championships. Eight athletes were selected for the European cross country in 2016.

The University also measures its success from results in the BUCS championships. For a small university of 6,000 students some may consider the results outstrip those of more illustrious names. One of the aims of the EPACC is for students to achieve at least an 80% best performance rate.

Each year in August the London Marathon Young Athletes Camp takes place with 80 youngsters attending. There is active recruitment of athletes for the courses and the facilities. As well as domestic athletes, significantly, athletes from abroad make use of the facilities during the summer and groups have come from Kenya, Australia, New Zealand and the USA. This year it had also been used by China too.

Eleven athletes, including former students, were selected for the European Championships in Berlin this year: Elliot Giles

(800m), Steph Twell (5000m), Jake Wightman (1500m), Charlie Grice (1500m), Andy Vernon (10,000m), Daniel Rowden (800m), Adelle Tracey (800m), Jade Lally (discus), Beth Potter (triathlon), Charlotte Purdue (marathon) and Lily Partridge (marathon).

Some of the advantages of training at a facility like St. Mary's include: training in a group of other elite athletes; great atmosphere at training sessions; the presence of two highly experienced full-time coaches; excellent facilities; great running areas nearby such as Richmond Park and Bushy Park; good medical back-up and massage readily available; geographically well positioned with motorways close by and also Heathrow airport and only 30 minutes by train from central London.



Shelayna Oskan-Clarke 800m international trains at St Mary's

Scaling approach to the physiology of distance running

SCIENCE: Performance characteristics of 1500m and 10.000m specialists. A new model for human running performance by Guillaume Adam & Thorsten Emig

Introduction

Models to predict performances in running can be useful for both racing and training. It has been almost hundred years since the first systematic study of the connection between physiological principles and world record running performances was performed by Nobel prize winner Archibald Hill (1925). He proposed a mathematical model, based on metabolic energy considerations, for the maximal power output during a race. His so-called running curve predicts that the maximal power output first decreases rapidly with race time but then remains constant. This implies the existence of maximal speed that can be sustained for any duration. Variations of Hill's model have been proposed to predict performances. However, the existence of a maximal speed that is sustainable for an arbitrarily long race contradicts running records. In fact, existing models appear to be unable to explain a fundamental observation that has been made already by Hill: The average running speed during a race keeps decreasing with the duration of the race but rather slowly, namely according to a logarithmic time scale, see Fig. 1.

For distances raced below VO_{2max} speed, this means that the difference between racing speed and speed at VO_{2max} increases two times when the race duration is squared. For example, if the speed at VO_{2max} is 400m/min, and the average speed during a 10min race is 370m/min, then the speed difference is 30m/min, and the runner can sustain a speed of 340m/min

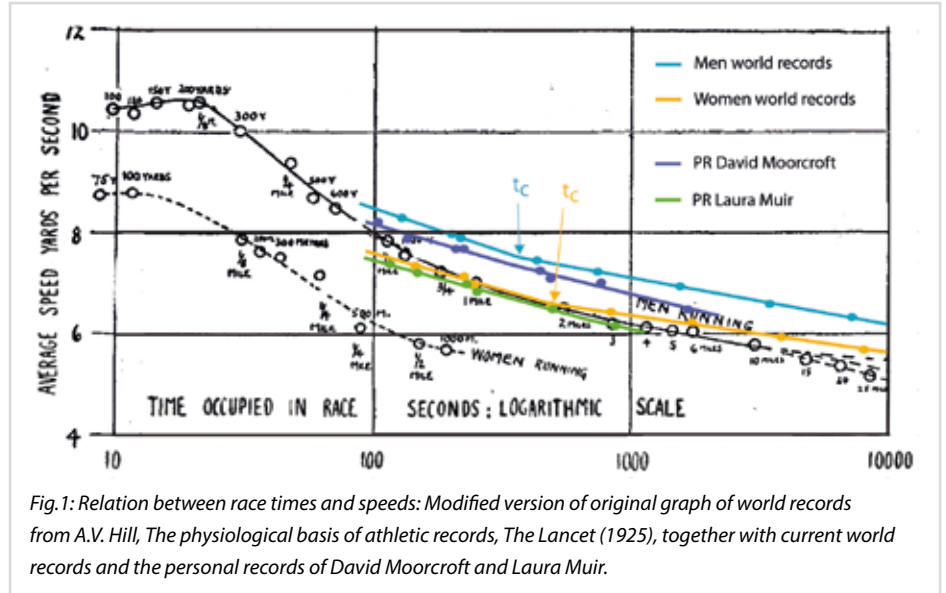


Fig.1: Relation between race times and speeds: Modified version of original graph of world records from A.V. Hill, *The physiological basis of athletic records*, *The Lancet* (1925), together with current world records and the personal records of David Moorcroft and Laura Muir.

for 102 min = 100min.

This observation has been employed by Peronnet and Thibault in 1989 to deduce physiological characteristics from running records and to predict running performances with high accuracy. They introduced an endurance index for long distances that accounts for fatigue effects that are not related to VO_{2max} , and not accounted for by an effective VO_{2max} like the VDOT index in Daniels' popular running formula. The endurance index measures the amount of the above mentioned speed difference to the speed at VO_{2max} . Given these observations, one might ask what are the important physiological parameters that determine running performances over a wide range of distances. To answer this question, we recently developed a theoretical model from basic principles of metabolic power generation and utilisation. An important observation that is essential

for the construction of our model is that running economy (the linear relation between power output and running speed) usually becomes worse with the duration of a running event.

The detailed reasons for this observation are unknown. To our knowledge, our model is the first to explain the observed logarithmic relation between record running speeds and times. Not only world records but also the nowadays available large databases of race results, like PowerOf10 in the UK, helped validating our mathematical model.

Model for running performance and its applications

The idea behind our model is to find a minimal description of running performances that contains sufficient information about different physiological aspects as maximal aerobic power or endurance but not more parameters than necessary to reproduce and predict performances with high accuracy.

Contrary to many other models, we do not fix a priori any parameters but determine them individually from best performances. To describe running performance, one needs to know the power that a runner requires to run at a given speed (known as economy) and the maximal average power that the runner can sustain over a given duration. The new insight from our research is that the dependence of the maximally sustainable power on duration

	1500m Men	1500m Women	10K Men	10K Women
speed v_{6min} [m/min]	380.9	334.3	374.5	325.5
time t_c [min]	7.9	8.9	6.6	8.5
relative aerobic energy for t_c [%]	89.4	89.4	91.0	91.2
time $t_{90\%}$ [min]	32.2	38.2	35.8	54.6
AEI	3.91	4.11	5.43	6.27
time $t_{110\%}$ [min]	3.3	3.8	2.2	2.7
ANEI	0.42	0.41	0.35	0.34
average error for race times[%]	0.74	0.77	0.77	0.76

Table 1: Model predictions for physiological characteristics (average values for top 450 runners in each of the four groups). Last line: Average deviation (relative error in %) between model and actual PRs.

can be computed from the upward shift of the power output that compensates the decline of running economy over time. The result of our computation leads precisely to the relation between speed and logarithmic time depicted in Fig. 1 for the 1925 world records (according to Hill) and the current world records.

Interestingly, our study predicts a certain race duration t_c where the slope of linear relation between speed and logarithmic time changes, see Fig. 1. The time and speed at this point can be associated with maximal aerobic power or oxygen uptake. When we determine the parameters of our model from current world records and then deduce the record times from those model parameters we find a prediction error of less than 1%. After this validation for world records, we decided to apply the model to hundreds of individual runners. In British running, both David Moorcroft and Laura Muir are probably two of the best examples for consistent performances over a large range of events, from 800m to 5000m. Their personal records are shown in Fig. 1. Due to their specialisation to middle distances only, the change of slope at t_c is less pronounced. Often it is not possible to have fully consistent data for 800 meter specialists who do not have sufficiently many results on longer distances. Also, performances should be accomplished at a similar running level, typically within one or two seasons for young pro-runners as their running performance improves quickly.

Physiological parameters: velocity at VO₂max, time at VO₂max, aerobic endurance, and anaerobic endurance

From our model every runner can obtain four physiological indices that are computed from the performances on their raced distances: (1) the time t_c at which the graph in Fig.1 changes slope, typically the time over which maximal aerobic power (VO₂max) can be sustained, (2) the average speed that the runner achieves during a race of duration t_c , (3) the aerobic endurance index (AEI) that is determined by the slope of the graph above t_c measuring the long distance endurance, and (4) the anaerobic endurance index (ANEI) obtained from the slope below t_c quantifying the short distance endurance. The first two indices could be obtained in a lab test, with the potential problems of fluctuating treadmill speed due to breaking forces and a lack of “real world” conditions. The two endurance indices can be obtained only from race results or time trials. The practical meaning of the AEI is that a runner can sustain 90% of maximal aerobic power for a duration of t_c multiplied by AEI. Similarly, 110% of maximal aerobic

power can be kept up for a shorter duration of t_c multiplied by ANEI. These indices allow to compare runner's various factors that determine performance. The faster you are, the higher the velocity at VO₂max. Nevertheless, t_c , AEI, and ANEI can be the same for runners of completely different levels, and they depend on the distance specialisation of a runner.

Databases of running performances: Effect of specialised training

Nowadays, large and detailed open access databases with athletic performances are available online. For example, in the British database PowerOf10 or in the French Athletics Federation database, all race performances for a given runner are

available. This makes it possible to validate mathematical models without using sometimes artificial result from lab testings. Nevertheless, data quality still can have some impact. For example, race performances do not always reflect the full potential of an athlete if it was in a tactical race or if the runner was not in a peak shape. Therefore we only considered personal records (PRs) and we neglected performances that were clearly inconsistent with other PRs of the runner (e.g. average speed slower on a shorter distance). In order to test our model and extract typical physiological indices for runners specialised on different distances, we analysed PRs of British athletes from the database PowerOf10. We selected four groups, each containing 450 runners, composed of female and male

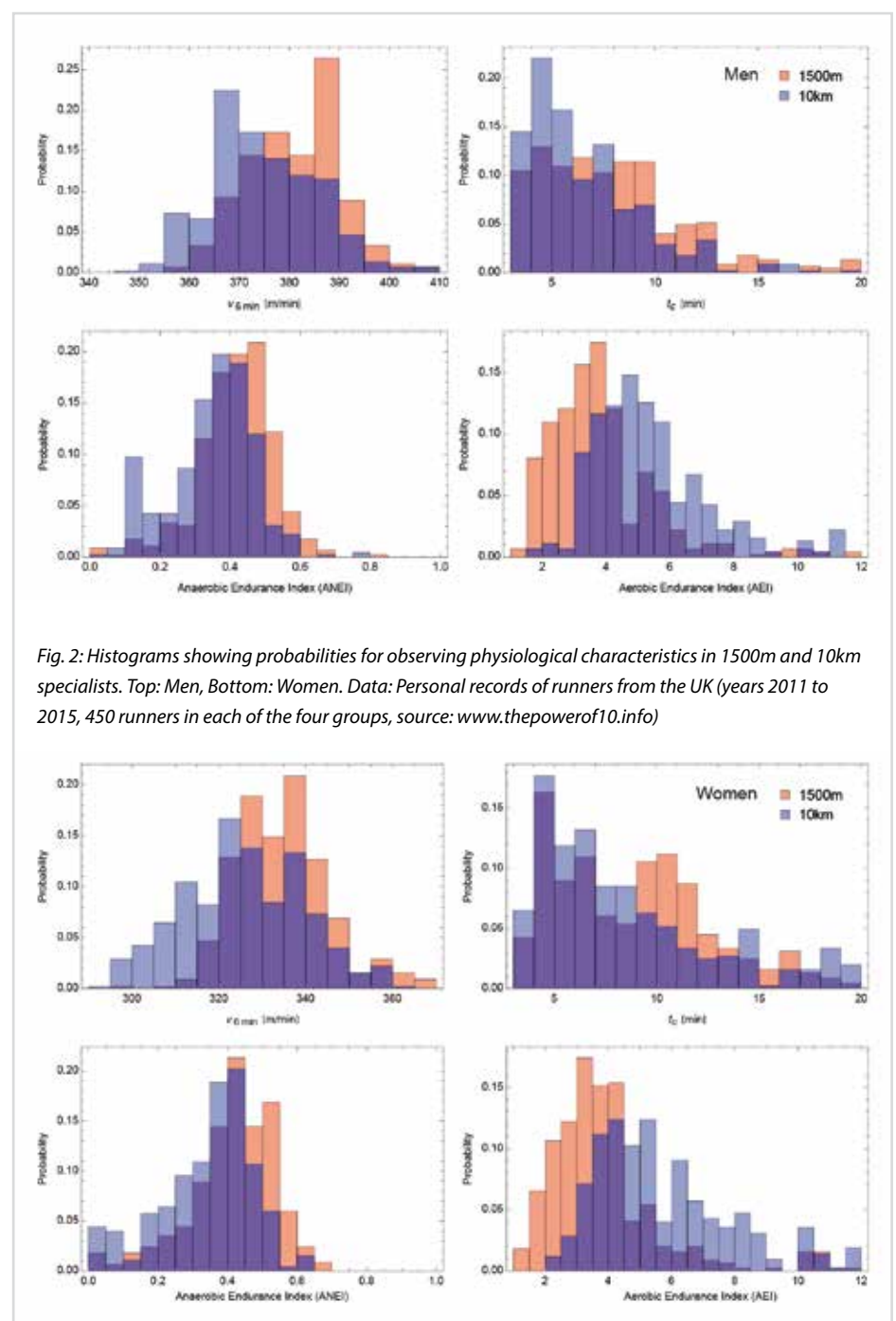


Fig. 2: Histograms showing probabilities for observing physiological characteristics in 1500m and 10km specialists. Top: Men, Bottom: Women. Data: Personal records of runners from the UK (years 2011 to 2015, 450 runners in each of the four groups, source: www.thepowerof10.info)



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Eilish McColgan in action in Berlin.

runners with best consistent performances on the distances of 1500m and 10km. We then applied our model to their PRs and extracted their physiological indices with average values summarised in Tab. 1. Firstly, just using the four indices, our model predicted the runner's PRs with high accuracy with errors of less than 1% (see last line of Tab.1). Secondly, we could find characteristic differences in the indices for British Milers (1500m) and British 10k runners: The typical speed that a runner can maintain for 6 minutes (v_{6min}) is higher for milers than for 10km specialists. Also, the time t_c over which VO_{2max} can be sustained is longer for milers than for 10km runners. The relative contribution of aerobic energy to a race that lasts for a time t_c is slightly higher for the 10k group (about 91% versus 89.4% for milers), probably reflecting more training in the aerobic range. A clear distinction between milers and 10km specialists can be observed from the endurance indices: While the 10km group has a better AEI and hence can sustain for a longer time ($t_{90\%}$) 90% of VO_{2max} , the milers have a better ANEI and can keep up 110% of VO_{2max} for a longer time $t_{110\%}$ than the 10km group. These physiological observations clearly reflect the distinct type of training of milers and 10km runners. Another important observation of our analysis is a large variation of indices among athletes. Fig. 2 shows the probabilities to observe certain values for the physiological indices in the 4 groups of analysed UK runners.

How our model can help runners and coaches for training and racing?

From our model, race performances are predictable for races of any duration from about 100 seconds to 4 hours. Of course this is useful for establishing racing strategies. It is also useful for training when coaches often define paces based on an equivalent distance: 1500m pace, 5k pace, 10k pace or marathon pace for instance. Following the progression of a runner over time, it

is also possible to analyse the effect of certain types of training on physiological characteristics.

For instance, a coach might decide to focus either on improving velocity at VO_{2max} or improving aerobic endurance based on the current profile. Also, for recruiting athletes and to decide on their optimal race distance, it might be interesting to understand how the physiological indices compare to the typical distribution of indices in a given group of specialists.

Conclusion

The large amount of data that one can now collect from millions of runners (for example heart rate, power, stride frequency and GPS data) will probably help building better models and understanding human

performance and physiology in the future. Our model and its applications demonstrate that performances obtained under real world track or road conditions can now be used to analyse individualised physiological response to training outside the laboratory. Future research on exercise physiology should lead to further improvements in understanding training and performances. The use of connected device, and the large collection of race results, and data from smart devices and sensors could help researchers to understand the complicated relation between training and performances on an individual level. It shall be interesting to apply our model to analyse outside the laboratory the effect of altitude, weather conditions, age of the runner on physiological indices and performance.



Laura Muir competing over 1500m in Rio.

MARK SHEARMAN

Segment to segment pace variability

Tactical decision making is crucial in championship middle distance running

Dr. Andy Renfree, University of Worcester, UK
Dr. Arturo Casado, Universidad Isabel 1, Spain
In a previous article in the BMC News we discussed the importance of good pacing in order to achieve the levels of performance of which an athlete is capable. In order to do this, an athlete needs to distribute effort in a way that results in realisation of physiological potential, and scientific research consistently demonstrates that best times in most endurance events are achieved through a relatively even pacing strategy. There is a 'problem' with this suggestion though when it comes to running in championship events. Here, 'reward' is based on finishing position, regardless of finishing time. Running fast will win you no medals if you don't finish in the first three in the final, and likewise qualification from preliminary rounds requires an athlete to finish with a specified position. There are admittedly usually a number of additional places available for

'fastest losers', but it would be very risky to rely on this as a strategy. Analysing the tactical determinants of success in middle distance events is complicated, but a number of recent studies have attempted to do just this. The results also allow identification of a number of strategies more likely to result in success.

An important observation was made by Mytton and colleagues (2015) who analysed pace variability (how much speed changed from race segment to race segment) in athletes who won medals or failed to win medals at major championships in both swimming and middle distance running events. Obviously the medallists completed the events faster than the non-medallists, but the medallists displayed greater variability. This differs somewhat from the typical finding in analyses of non-championship events where faster times are generally associated with relatively low variability i.e. an even pace. This variability in the medallists was not however achieved through wild fluctuations in speed as the

race progressed, but was almost entirely due to a large acceleration in the closing stages. Perhaps not an entirely surprising finding, but the implications for athletes are not entirely clear. Is possessing a very fast finish enough, or does positional awareness also have a role to play? After all, it's easy to generate a high degree of variability simply by running very slowly in the early stages and running a very fast last lap. However, this is not much use if you are far behind when the bell rings.

Another analysis of the middle distance events at the Olympic Games looked at the influence of race position at intermediate points on probability of automatic qualification from preliminary rounds in the middle distance events. The key finding in the 800m event was that probability of securing an automatic qualification decreased with race position at every intermediate 200 m point. Athletes who were already in a qualifying position (typically first two or three places) were more likely to qualify than athletes not in such a position. In fact, race positions throughout 800 m races were remarkably stable, with relatively few positional changes. More positional changes were apparent in the 1500 m races, but even then, probability of automatic qualification was very low for athletes not in the required positions by the second half. Based on analysis of intermediate positions alone then, a clear trend emerges whereby athletes who adopt positions closer to the front in the early stages are more likely to subsequently qualify to the next round of competition. Sitting at the back of the field and hoping to rely on a big kick would therefore seem a very risky strategy, and in the 800 m suicidal.

Although the Olympic analysis examined positional changes, it did not look at split times, and also ignored the behaviour of athletes who qualified via the other available route – as a fastest loser. These have been incorporated in a more recent study which looked at the middle distance events in the 2017 World Championships. To some extent, the results replicated those of the Olympic analysis whereby it was found that probability of eventual qualification



Euro 4th-placer Adelle Tracey went sub 2 in Berlin.

MARK SHEARMAN

Laura Weightman – excelled in Berlin to take Bronze over 1500m.



MARK SHEARMAN

was highest for those who adopted positions closer to the front from the outset (especially in the 800m). However, even though correlations between positions at intermediate points and final position were high, they were even higher between rank order split time on the final lap and eventual position. Essentially, if you are able to run the fastest last lap of all competitors, then qualification was almost certain. This *might* imply that the ability to run a fast final lap gives you the opportunity to 'dig yourself out of a hole' should your race position be less than ideal. Nevertheless, given the still high correlations between intermediate and final positions this is not something that would necessarily be recommended.

This may all sound very well if you are one of the 'better' athletes who has a realistic chance of qualification and is able to keep close to the front all the way. What about those athletes who may be aiming to qualify despite being up against athletes capable of superior times? There does appear to be hope (in the 1500m at least). When those athletes who qualified as fastest losers

were analysed, then it was found that they adopted positions closer to the front and, importantly, also adopted initial speeds representing a higher fraction of their absolute ability. In effect then, they were 'rewarded' for their bravery in getting out close to the front and ensuring they kept the pace reasonable.

One further issue related to tactical

decision-making that should be considered is how far the athlete actually runs. A fascinating analysis of the 800 m and 5000 m finals at the 2000 Sydney Olympics revealed that the winners did not in fact run the fastest over 800 m and 5000 m! However, they did run less total distance than athletes who maintained higher average speeds but covered a greater total distance. We speculate that this explains the relatively stable race positions observed in 800 m races. Half of each race is run on bends, and the very high speeds would likely mean the energetic costs of overtaking on bends are prohibitive. If you are close to the front then there are fewer requirements for trying to accelerate around other athletes.

In summary then, what recommendations can be made? The first is very obvious – get yourself as 'fit' (as evidenced by the ability to run a fast time) as possible. Both qualifiers and non-qualifiers typically finish races in times representing around ~97% of seasons best in championship heats, indicating that usually it is the athletes with the better absolute abilities who qualify. In slow races they are presumably able to accelerate more in the final stages because they have a greater physiological reserve remaining by the time they get to the final lap. However, being able to run a fast time in an evenly paced race does not guarantee the ability to accelerate rapidly off a slow pace. Secondly – be aggressive and proactive. You are far more likely to progress if you adopt positions close to the front of the race, especially in the 800m event. If you are an athlete with a borderline chance of qualification, then the same advice holds true. Even if you don't qualify automatically, you are still increasing your chances of qualification as a fastest loser by getting out and keeping the pace decent in the early stages. Finally, ensure you don't run any further than necessary. By being close to the front you are better able to pick your 'route' without other athletes interfering.

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800m Training



Aje Wilson. 2017 World Championship 800m bronze medallist – superb tactician and racer.

The three types of 800m athletes are discussed by John Skevington

Coaches have to identify the three different types that may compete over two laps and also the need to fit the training to the athlete. This article examines three published training schedules to examine just how important it is to match the training to the athlete and not the other way round.

One of the main contributory factors behind the improving racing performances in the last 50 years was the arrival in 1960 of the New Zealand Olympic medal winning performances of athletes coached by Arthur Lydiard. In 'Run to the Top' (1962) Lydiard preached mileage and a balanced programme of five linear phases of work that led to a season's racing climax. He proposed mileage as the way forward to better results by noting that "many men can run 440 yards in under 50 seconds, but very few can string 4 laps together to run a mile

in under 4 minutes."

Modern day training is still heavily influenced by the ideas of Lydiard who insisted that all athletes would benefit from doing training based on the system he advocated. Although every event from 1500m and upwards requires a large aerobic endurance base, the 800m remains a problem in endurance. One article explaining this was by Karikoski in 1987, although it was four years before a translation in English appeared in 1991.

Type A: (800m/1500m type)

Examples from the UK are Steve Ovett, Seb Coe, Steve Cram and Peter Elliott. These athletes competed at a high level at both distances. Weekly training mileage can be very high, although Ovett ran much more than most. He never kept a training diary so the example shown below, recorded by his training partner Matt Patterson (1999), is of a typical winter's week in November 1979 in preparation for the 800m/1500m double in Moscow 1980. Two sessions (am/pm) were done almost every day on the road. (See Table 1.)

This is similar to Lydiard's approach, but it does have important differences. Although Lydiard may have planned a linear system of five distinct blocks of training, where one block followed and built on the previous block of training, Ovett included some very fast work and hill sessions throughout the winter period which lasted for six months rather than the 10 week block of high mileage proposed by Lydiard.

Type B: (800m specialist)

Examples are Johnny Gray and Tom McKean. These athletes prefer to compete over 400m for their second event and are much weaker over 1500m, though they may still be able to run under 4 minutes for the mile. Their

mileage typically revolves around 50-70 miles per week. The training example of Gray is from an article in 'Track Technique' and all distances are in yards.

Non-Competitive Season

Mon: 6 miles easy, 16x220yds (3 easy then 1 good speed-repeat); 6x150yds good speed; 10x110yds easy.
Tue: 6 miles easy, 8x440yds with 220yds jog (3 easy then 1 good speed-repeat); 4x220yds good speed; 10x110yds easy.
Wed: 12 miles easy.
Thur: 6 miles alternating easy and fresh.
Fri: 8 miles easy.
Sat: 10 miles alternating 2 easy and 2 fresh.
Sun: 8 miles easy.
(Fresh is @40-45% - picking knees up; Good swing is @ 60% - pushing off rear leg with power; Good Speed is a focus on leg turnover.)
Total: 56 miles + 3 + 4 = 63 miles
Total mileage for Gray was generally 60 miles per week and 20 miles per week plus intervals in the summer.

Summer 440yds would be run in 50-52 seconds (slower in the winter). There is a good amount of mileage, not excessive, but there is a greater mix of sessions throughout the year. Intervals are performed regularly in the winter, although mileage drops by 66% from winter highs, it is still apparent in the summer. It is important to retain the endurance base especially for females who lose strength (endurance) more quickly than males.

Type C: (400m/800m power athlete)

Examples are Alberto Juantorena and Marcelo Fiasconaro. These athletes may never compete over longer than 1000m

	AM	EFFORT	PM	EFFORT
Sun	10 Miles	57-60min	10 Miles	54-55min
Mon	5 Miles	Easy 35min	10 Miles	Fast/ steady 52-53min
Tues	10 Miles	Hard + 4x300m fast jog rec + 4x400m very steep hill jog rec		
Wed	10 Miles	58-60min	10 Miles	Plus technique work at Crystal Palace
Thurs	5 Miles	Easy 35min	10 Miles	Steady 58-60min
Fri	5 Miles	Easy 35min	5 Miles	Easy 35min
Sat	5 Miles	Easy 35min	6 x 1k	Hard (30-60sec rec) in spikes on grass
Total	100-105 mpw (Some weeks in winter build up to Moscow 1980 up to 120mpw)			

Table 1.

1975-1976	These are estimated	Total (km)
Mon: Warm-up + callisthenics, Structured Fartlek 13km		13
Tues: Warm-up + callisthenics, Grass run game. Weights 15 tons. Relative speed 3x5x200m medium speed av 23.84sec	+ 2k Warm-up and 2k Cool-down	7
Wed: Warm-up + callisthenics, Progressive series 3x100m Rhythm Endurance 4 x 1km medium speed av 2:35.15	+ 2k Warm-up and 2k Cool-down	8
Thur: Warm-up + callisthenics on grass, 2km grass, 3x3x400m, 2km	+ 2k Warm-up and 2k Cool-down	8
Fri: Warm-up + callisthenics on grass, Strength 15 tons Relative speed 3x5x200 Ave 23.63	+ 2k Warm-up and 2k Cool-down	7
Saturday Warm-up + callisthenics, 3x100m progressive series 1km, 500m, 1km, 500m av 1km 2:41.35; 64.35sec	+ 2k Warm-up and 2k Cool-down	7
Sun: Rest		50 kpw

and their mileage may never go higher than much above 30 miles per week. They have a different physiology than the aerobic athlete who has a big engine (heart and lungs) to power them. This type lacks the big engine of a great heart and lungs, but compensates for it by having a much more developed anaerobic system.

800m Training for Alberto Juantorena

Mileage in the summer could reduce to 25-30 kpw with continuous runs down to 10km and under. The majority of the training would be in some form of speed work in sets up to 600m (perhaps 1000m) where 8x200m in 23 seconds in March developed into 2x3x200m in 22 seconds or faster in July.

Examining Training Schedules

I was fortunate to interview a number of outstanding British endurance coaches when doing my Master's in Coaching. One of them, Norman Poole had an athlete who was moving from 400m to 800m. That athlete could only run for around 16 minutes! Training to improve his aerobic capacity had to be individualised and it was significantly different from the training of other group members such as Michael Rimmer. In other words the coach matched the training to the athlete. Not recognising which type of athlete you are dealing with will result in failure.

When Lydiard was asked what George Kerr had to do to beat Snell after the Rome 800m final, he was of the opinion that Kerr had simply to adopt his five phase approach. He saw his system as universal for all athletes.

In Ovett's schedule, you can see how Harry Wilson had moved on from Lydiard's linear approach to a more complex system with speed work all year round. Lydiard's yearly total from the five phases is 3,520 miles, (70 miles per week) but the year's plan does feature wide swings between the five phases and a focus on a single yearly peak. Alberto Salazar (2017) said at the NXN Coaches Clinic in 2012 in Portland, "All of us have heard

of Lydiard. He was a revolutionary coach; a great coach. But my training system is very different and my belief is that the human body likes continuity. It responds well to repetition." Support would also come from

Martin and Coe (1991). Peter Coe was of the opinion that it was essential to be close to speed all year round. Whatever you decide as a coach, you have to match the session to the athlete.



1:43 and 1990 Euro Silver medallist Tom McKean.

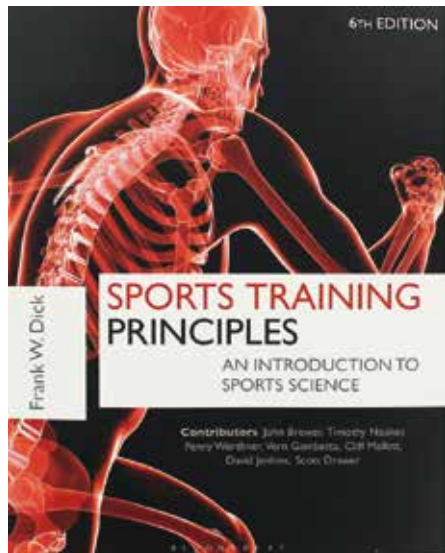
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BMC Book Reviews

Sports Training Principles – An Introduction to Sports Science 6th Edition

By Frank Dick

Publisher : Bloomsbury.



Contributors to the 6th Edition of this book include such luminaries as John Brewer, Tim Noakes and Vern Gambetta (see footnote). The first edition was published in 1980 and has developed, as you might expect, with the advancement of sports science. Dick

himself was in charge of the very successful British athletics team at the 1980 Olympics in Moscow and coached, among others, Daley Thompson.

The contributions to sport science by the east European scientists in the early days have been included and are referenced in detail at the end of each chapter. There are chapters on mechanics and nutrition as well as physiology and other topics including the growing child. The sections on speed, strength, mobility and endurance development are particularly relevant to middle distance coaches. Frank Dick has always been a great speaker and it is the attention to detail that is a real strength of this book.

One chapter is entitled 'Fitting Things Together' and this section alone sets it apart from what might be called similar books. This deals with feedback from the coach to the athlete. Preparation for major events is covered and there are very detailed forms which can be used as a template. These include feedback from the athlete and the coach as well as the detailed preparation for major championships. Nothing is left to

chance. The publishers make it clear that if you want copies of these forms they can be downloaded from their website.

So who is this book for? Certainly for those studying sports science but also very useful for coaches and administrators preparing athletes for championship events. This would be a useful addition to the library of BMC members. This is a book that you are likely to come back to again and again.

Footnote

- Tim Noakes is the author of the 'Lore of Running', a bible for coaches. Will there ever be a fifth edition of this influential book?
- John Brewer is the editor of 'Running Science' and author of 'Run Smart' reviewed in recent editions of the BMC News
- Vern Gambetta is the author of 'Athletic Development'
- For those with long memories the names of Matveyev, Schmolinsky and Harre are synonymous with the advances of sport science in eastern Europe and Russia in the 1970s and 1980s.

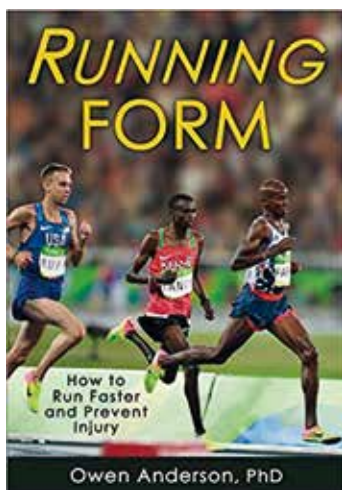
Running Form

By Owen Anderson (PHD)

Publisher Human Kinetics

This is an interesting book by the author of 'Running Science' reviewed in an earlier BMC News. It deals in detail of how improving the way you run can enable you to run more efficiently, faster and reduce the risk of injury. Any book that deals with those topics is worth a look!

He starts with the Kenyan runners who are good models for efficient running he maintains. Many start by running barefooted in their early days and this encourages them to run with a mid foot strike or fore front landing. Many Europeans land with the heel first which encourages braking of the running action. This what he calls 'running with square wheels' or as he also puts it is like 'running with battering rams



instead of springs'.

This also increases the risk of injury. It is interesting that some have claimed that even with the continuing development of running shoes the rate on injury amongst runners is now worse than it was years ago.

There follows a detailed discussion of reversal of swing (ROS), maximum shank angle (MSA), and shank angle at touch

down (SAT). All of these terms, as applied to the running action, can be assessed by the use of a video camera or for that matter a smart phone.

If this is all sounding a bit complicated then there follows some very practical advice. The first of these is a section that deals with drills that enable you to gradually move from heel striking to towards midfoot foot landing As Anderson

says 'For the first time in running history running form can be quantified and then developed and coached in a proper way'. In a way this makes sense. If you need to practice a golf swing or practice playing the piano to achieve perfection then why not try to do the same for running?

There are sections on dynamic running drills and an important section on running specific strength training.

He does have section on 'the puzzle pieces of posture' that includes:-

- The feet and ankles
- The legs including the knees
- The hips
- The trunk
- The arms, including the elbows and hands and the head and neck.

Anderson also deals with how to integrate all of this into a programme. There are coaches who believe that the way we run is a natural result of our bio mechanics. Then this is not for you. If you are looking for improvements in the running action that is repeated thousands of times then this book is worth a look.

By Alastair Aitken.

"The man who can drive himself further once the effort gets painful is the man who will win." (Sir Roger Bannister)

Sir Roger Gilbert Bannister, was born in Harrow on the 23rd of March 1929, was married with four children. He passed away peacefully on the 3rd of March 2018.

His Personal Best times were
800/1:50.7/1500 3:43.8/Mile 3:58.8.
All on cinders.

Roger Bannister

It was not the 4-minute mile that gave him the most satisfaction but, his 40 years in medicine, particularly his ground-breaking research into Neuro surgery. He came from humble beginnings and often spoke about running as a key to 'social acceptance.'

However, Bannister's feat to be the first four-minute miler, when he ran 3:59.4 on the Iffley road track, Oxford on May the 6th 1954, is something that will live on in the minds of sporting annals.

His friends at Oxford University, Chris Brasher and Chris Chataway, helped set it up. Brasher went through the first quarter in 57.5 and at the half he led in 1:58. 2 then in the back straight of the third lap he fell back and, from behind Bannister came Chris Chataway to take it on.

It was 3.00.4 at the bell and with Chataway still in attendance, Bannister put in his lung bursting challenge, after 1500 and never let up to the finish.

Dave Moorcroft reflects, "Sir Roger's achievement in 1954 is quite simply the most famous world record in track and field. This is because of both when he did it and how it inspired a new generation of middle-distance runners around the world. It is testimony to Sir Roger that his record for the mile was the only non-Olympic distance that has that kind of legacy"

Brendan Foster in tribute, "Sir Roger was the man who showed us how to

break our own barriers, and he was a true gentleman too."

I must point out here that it should not completely overshadow the fact of the first man to do inside 3:50 and, that was John Walker of New Zealand, who ran 3:49.4 in August 1975.

What did Sir Roger Bannister think back in 1979 about people breaking the World record in the future "I feel a clash between Filbert Bayi and Jim Ryun would obviously produce a very fast time and a World record of 3:46" In actual fact it was not till Steve Cram ran inside 3:47 on the 27th of July 1985, with a time of 3:46.32.

The fastest miles before Bannister, was by two Swedish runners Gunder Hagg in 1945 who ran 4:01.3 & in 1944 Arne Andersson did 4:01.6.

One must understand that except for the exceptions, like Emil Zatopek & Gordon Pirie, people did not do the volume of training in the 1950's.

That was the case with Bannister, who was a medical student with limited time to train.

However, he did come under the good influence of Franz Stampfl, who went on to coach Brian Hewson and even Ralph Doubell, the 800 Olympic Champion of 1968.

Bannister had several early achievements which indicated his future success. It was indicative of the time that training was not excessive, fitted in-between his stints as a junior Doctor. Sir Roger recalls:

"I trained for less than three-quarters of an hour for five days a week. I didn't have the time to do more...but it was all about



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quality not quantity. I didn't waste my time jogging ever."

He beat Bill Nankeville, the stylish, 4 times AAA.s Champion over a mile in 1951 and, the year before that Roger Bannister concentrated on the 800m and came 3rd in the European in 1:50.7 behind the winner John Parlett of GB (1:50.5) and he was a close second behind 1948 Olympic 400m Champion, tall Jamaican, Arthur Wint, over half a mile.

In Helsinki in the 1952 Olympics Bannister was 4th in the 1500m, but was unprepared for heats and a final but, after that, he was determined to improve.

He did with his four-minute mile. He beat the was the next World record holder, who was John Landy of Australia (3:58.0). It was in the epic British Empire & Commonwealth Games in Vancouver in 1954 (1 Bannister 3:58.8; 2 Landy 3:59.6; 4 Rich Ferguson of

Canada 4:04.6).

The event that stands out for me, which showed what a great competitor Sir Roger was, was the European Championships over 1500 in Bern in 1954.

The 5 names behind him were excellent 1500m men (1 Roger Bannister (GB) 3:43.8; 2 Gunner Neilsen (Denmark) 3:44.4; 3 Stanislaw Jungwirth (CSR) 3:45.4; 4 Ingvar Ericsson (Sweden) 3:46.2; 5 Werner Lueg (WG) 3:46.4; and 6 Sandor Iharos (Hungary) 3:47.0.

It was my first term, as a senior at boarding school in Norfolk, when a prefect told me Bannister had just broken 4 minutes for the mile. I did not really believe him at the time but how wrong I was....

"However ordinary any of us may seem, we are in some way special, and can do things that are extraordinary, perhaps until theneven thought impossible."

(Sir Roger Bannister)



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Bannister rings the bell and presents medals to distance stars Craig Mottram, Mo Farah and John Mayock in the 2004 Oxford BMC Mile.

Diane Leather

Diane Leather Charles, the first woman to run a mile in under 5 minutes and a true running pioneer, passed peacefully on 5 September. Her family said, "She was 85 years young and still very active right up to mid-August, when she succumbed to a short illness."

Diane Leather is probably the best British athlete you may never have heard of. Her talent and achievement came over a wide range of distances. In today's age, women have the stage to showcase their range of talents, but this wasn't the case in her day.

Over a three-year period from 1953-55, Leather improved the women's world best for the mile on five occasions and by a total of 23 seconds, taking it from 5:08.0 to 4:45.0, a time that remained unbroken for seven years.

Her relatively brief career saw her also equal the world best for 440 yards and set world best performances for 1500m twice and was also the first woman to go sub-4:30.0. These performances were classified as world best performances, rather than world records, as the only women's



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individual middle distances recognised by the IAAF were the 800m and 880 yards and she held the IAAF world record for 800m. She excelled at cross-country also and won the England National Cross Country Championships for four consecutive years from 1953-56 and claimed individual and team gold in the International Cross Country Championships on three occasions, 1954, 1955 and 1957.

On May 29, 1954 at the Midland Area Championships on a rain-soaked cinder track at Alexander Stadium, Birmingham, the mile was held just 45 minutes after the 880 yards, which Diane won, establishing a British Record. In that race she was way ahead of the field from the off and by the end she had 160 yards to spare on the second finisher to break the tape in 4:59.6 and become the first female to go under 5 minutes. This barrier was broken just 23 days after Roger Bannister had broken the 4-minute barrier in nearby Oxford.

Born on 7 January, 1933 in Streetly, Staffordshire, she took up running at the relatively late age of 19 after leaving school and being inspired by watching the 1952 Helsinki Olympic Games. She joined Birchfield Harriers in the autumn of that year (1952) where she started training for the winter events under the coaching eye of Dorette Nelson-Neal. At the club she immediately impressed as a versatile runner, winning the Midland Cross Country Championships and then the England National Cross Country Junior and Senior titles in her first winter with the club. In the Spring of 1953, she was a 20 year-old novice on the track. By the end of that year she had developed as a front-running middle distance runner unchallenged on the



domestic scene.

The Mile became a favourite event and she set a world best and English native record of 5:02.6 at the end of September. That time didn't survive long, being lowered two months later by Edith Treybal of Romania, who clocked 5:00.3 and the prospect of 1954 becoming a race to be the first woman to break 5 minutes for the mile perhaps became a focus.

The summer of 1954 was only her second track season but it was an intensive and memorable time for the Birchfield Harrier. On 26 May she regained the world best performance by lowering her own British Mile record to 5:00.2 and a mere three days later, she lowered the mark to create history as the first female to go sub-5:00. Three weeks later, on 19 June she recorded her only individual world record, officially recognised by the IAAF, an 800m of 2:09.0.

In 1955, Diane improved her world best in the mile twice. In London on 24 May she ran 4:50.8 and then, in the early autumn, achieved a further improvement. The October edition of the 'London Illustrated News' reported: *"In an athletics meeting at the White City on September 21, with representatives from the US and seven Continental countries, Miss Diane Leather won the women's mile by some 100 yards in 4min 45sec. The International Federation do not recognise this distance in women's athletics events, but Miss Leather's time is likely to remain the best for this distance for some time. As a runner, Miss Leather is always a pleasure to watch and she finished without a trace of flagging, breathing easily and quite undistressed."*

She competed at the Olympic Games in Rome in 1960, as Mrs Diane Charles, but it was only over the 800m and she was eliminated in the first round, finishing fifth in her heat in 2:14.24 with her glory years sadly

behind her. After retiring from competitive athletics at the age of 27, she went on to teach, perform social work and raise four children. For nearly 30 years, she served CRUSE, the leading national charity for bereaved people in England, Wales and Northern Ireland that offers support,

advice and information to children, young people and adults. She was inducted into the England Athletics Hall of Fame and her true abilities, achievements and influence on women's running are continuing to be more fully and widely appreciated.



Diane Leather inducted in the England Athletics Hall of Fame.

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Diane Leather Fact File

Personal bests

400m	56.3 (1955)	British Record
440y	56.6 (1954)	= World Best
800m	2:06.6 (1958)	British Record
880y	2:09.0 (1954)	World Record (880y time accepted by IAAF for 800m)
1500m	4:29.7 (1957)	World Best
1 Mile	4:45.0 (1955)	World Best

Bruce Tulloh

Alastair Aitken's Recalls Memories of the Pioneering Athlete and Coach Bruce Tulloh

MICHAEL Swinton 'Bruce' Tulloh, was born on 29th of September 1935 and died at home in Marlborough on 28th of April 2018.

BRUCE TULLOH made an immense contribution to British athletics As a runner who raced from 12 to 82; an author of several books, such as 'The Young Runner'. He coached Richard Nerurkar, who won the World Cup Marathon in San Sebastian in 1993 (2:12.57). Nerurkar had a personal best time of 2:08.36.

When Bruce was out in Kenya for 2 years teaching, he gave Mike Boit great coaching advice, which improved his confidence no end and, told him he could be one of the best in the World. Bruce remarked, "As he was only fifth best in Kenya at the age of 23 Mike, seriously thought of retiring from athletics but...I then gave him some good time trials." It was after that Mike Boit went on to be a close up 3rd in the Olympic 800 in 1972 in Munich; 2nd in the Commonwealth in Christchurch in 1974 in 1:44.4 and then Mike won by a street in the Commonwealth 800 in 1978. So, that was the kind of effect Bruce had on the athletes he coached.

Tulloh got a science degree at Cambridge University, where he quite naturally obtained full athletics 'Blue'. He joined Shell Company first of all but ended up his working life as a School teacher for 20 years at the prestigious Marlborough College.

When I first interviewed him, on 30th of September 1962 at the White City stadium, it was after the European Championships of 1962 he was then a research Biologist. but, of course, his family and running were the important planks of his life, right till the very end. Other than his track success he was one of a very successful Portsmouth AC team road relay & cross-country team, along with Tim Johnston & Martin Hyman and others (*Portsmouth AC won the team award in 'National' Seniors in 1963, 64 & 67.*)

Bruce came very close to winning the 'National' in 1962 but, as it was Gerry North's home course, at Blackpool Gerry, was determined to hold him off in the finishing straight, so Bruce ended up a good second.

When I first talked to Bruce at length, it was for my first published article in an athletics magazine, called *Modern Athletics*. The heading of my article was 'The Qualities that Make a star' The three people that I

Bruce Tulloh in action at White City.



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The Barefoot runner competes over the country.

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gold medal that he won over 5000m in 1962. There was a loaded field in Belgrade when he won in 14:00.6, from 1960 and Olympic bronze medallist Polands' Kazmierz Zimny; (14:01.8) and Olympic 10,000 Champion Pytor Bolotnikov (14:02.6) from the USSR.

To mention a few others of quality in the race Michel Bernard & Robert Bogey of France Siegfried Hermann of East Germany and the British runner John Anderson.

"At the bell; I was well up and could not hear a man behind me then I started to put in a bit more effort. I knew I had a bit more extra and was happy then. I had run some good times. I had run 13:12 for 3 miles by then, that was pretty close to the world's best. I figured my chance was then. I had been beaten narrowly by Zimny in the Poland match earlier on, but I thought in a Championship race I could probably beat him.

"I convinced myself I was going to win. Bolotnikov won the 10,000 and did not like doubling up. He tried a few bursts, but he did not push it hard enough to drop me. I felt I had enough speed to out sprint anybody as I had broken 4 minutes for the mile earlier that year and so, it proved."

He ran across America in 1969. Los Angeles/New York, knocking eight days off the record and, when he was 58 he ran the London Marathon in 2:47.

A wonderful gentleman that was Bruce and, will be missed by many in athletics.

Tulloh, is survived by Sue Tulloh, who enjoys running too. Bruce & Sue Tulloh have three children Clive, Jojo and Katherine. They all ran to a high standard. The twin sisters were 1st and 3rd in the Under 15's in the English Schools Championships 1500 who are now in the 'W45's.

included were Bruce, Robbie Brightwell and Derek Ibbotson.

In 1962 I asked Bruce who inspired him most?

"Zatopek is my main inspiration. Following his ideas and his book, a great man and a very nice chap, Gordon Pirie as well has done a great deal for British athletics- He showed us how to train. Most of us have benefited from his example"

In 2011 Bruce Tulloh added these words "Gordon was an inspiration and a totally committed runner but very self-centred, as most good runners are but he would be very kind to you and helpful to young athletes and, set a great example in terms of hard training .He raised the standards. We went to Rome for the 1960 Olympics and it was very hot, and we did not acclimatise properly. None of made the final but Gordon took us to the beach the next day so, I have very

fond memories of Gordon."

In 1955 he won the Hong Kong Championship 5000 in 16:46 which he considered was his first breakthrough, after his days at Wellington College. A lot later in 1962 he won the Inter-Counties 6 miles from Martin Hyman at the White City and beat Derek Ibbotson to win the 3 miles. He was AAA's Champion for 3 miles in 1959; 62 and 63 but an intriguing aspect of his career was the fact that he won running bare foot!

"I had been running in bare feet on grass in Devon and on the beach and then tried it on the cinder track and it was okay. The old-fashioned black ash cinder tracks.

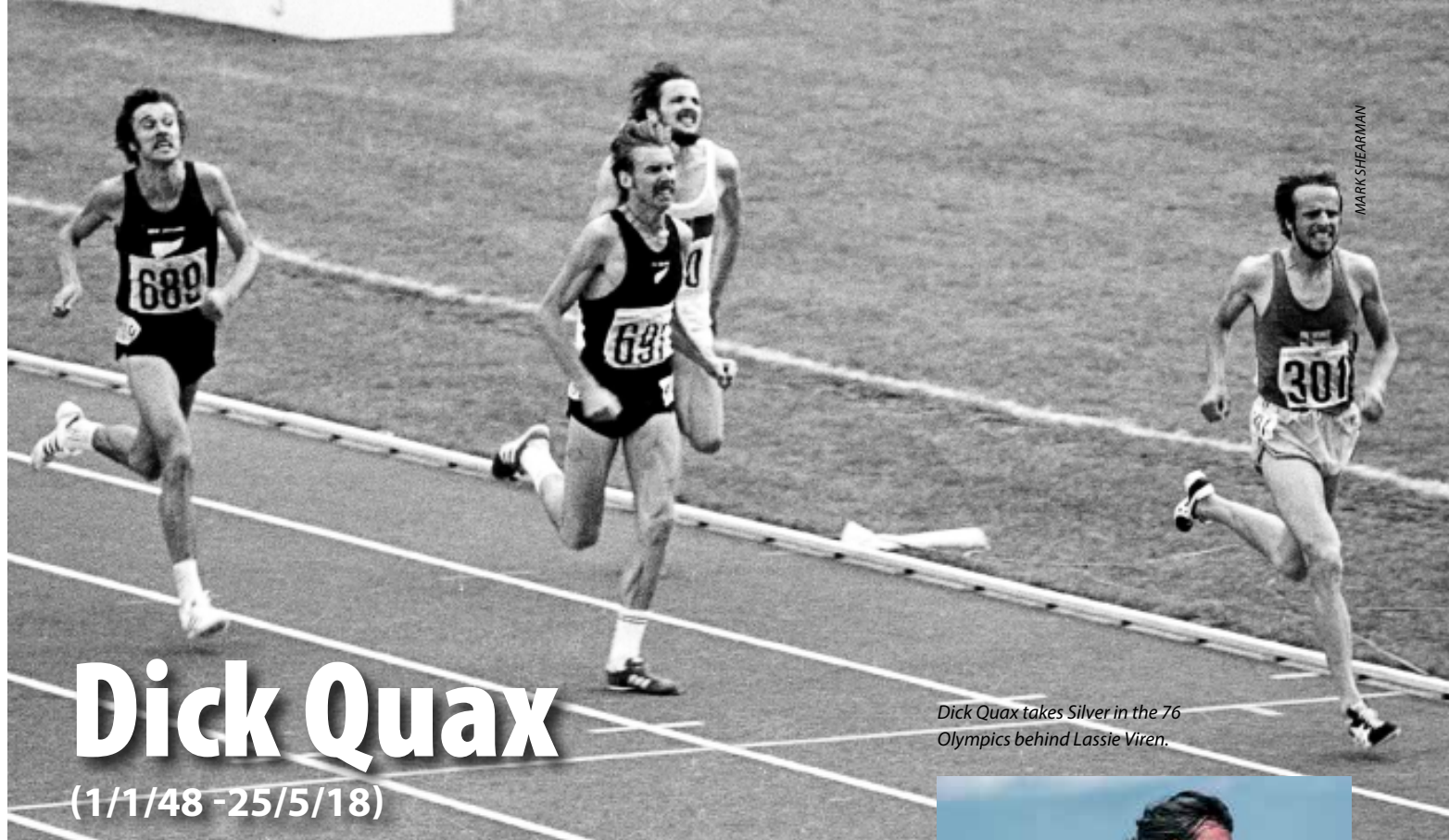
"It was just lighter in weight. You feel freer and easier. Run with a better action. I tried it out at the White City." *(It must have helped him, as in old measurements he was light at 8 stone 4lbs and 5ft ins tall).*

In 2011 Bruce talked about the European



Richard Nururkar wins the World Marathon Cup in 1993.

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Dick Quax

(1/1/48 -25/5/18)

Dick Quax takes Silver in the 76 Olympics behind Lasse Viren.

Alistair Aitken looks back on the trailblazing career of outspoken, and much-revered Kiwi distance star of the 1970's.

Just before the 'Great' trio of British middle-distance runners Seb Coe, Steve Ovett & Steve Cram led the World of middle-distance running in the 1980's, an equally impressive trio from New Zealand, lit up the tracks around the World, in their all black strip in the 1970's.

John Walker, the first ever to run under 3:50 for a mile and the 1500 Olympic Champion in 1976; Rod Dixon, who gained a bronze medal in the 1500 in 1972 and, also Dick Quax, a very popular man, Commonwealth silver in 1970 and Olympic silver in 1976, besides achieving a World 5000m record.

Dick Quax's three most notable races: 1970 Commonwealth Games 1500 in Edinburgh.

1 Kip Keino (Kenya) 3:36.6; 2 Dick Quax (NZ) 3:38.2; 3 Brendan Foster (England) 3:40.6; the same time as Peter Stewart (Scotland) brother of 5000 winner Ian Stewart.

"I had beaten Keino in March of that year, though he had a long journey from Africa. So, as I had beaten him that once before I thought I could beat him again. Perhaps the British guys had seen him run at his best so many times that they figured he was unbeatable where as I had only seen him run once and I had beaten him; so that gave me the confidence to think he was only as human as me."

1976, Olympic 5000 Final in Montreal.

First six: - 1 Lasse Viren (Finland) 13:24.76; 2 Dick Quax (NZ) 13:25.16; 3 Klaus Hildenbrand (FRG) 13:25.38; 4 Rod Dixon (FRG) 13:25.50; 5 Brendan Foster (GBR) 13:26.19 and 6 Willy Polleunis (BEL) 13:26.99. (14 ran)

"In the final my problem was I had all my confidence knocked out of me because of my illness leading up to the race. I remember at one stage it was very slow, and I was thankful for that."

"After about 5 laps Brendan Foster looked to me as though he was going to throw in a 59 or 60 quarter. He went for half a lap, looked round and saw everybody still with him and I felt he sort of threw it in a bit. I thought to myself—Thank God! I felt if a break had been made at that stage I probably would not have been in contention much longer."

Before his 5000 World record of 13:12.9 on the 5th of July 1977:

"I planned to break the world record because it was on the same day and the same place that I had missed the record by one tenth of a second the year before."

"It was the second day of the World Games; I was sitting in the stadium and it was freezing cold—about 10 degrees too cold—and I sat there shivering and ended up getting a cold. Two days before I ran the World record I could not even stay with Rod Dixon and Jos Hermens in a training run so that sort of threw my plans a bit haywire."

"The night of the race was cold and windy and not an ideal night, but I think if you have made a plan you should try and carry it



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out and I was lucky enough to get under by one tenth—it makes a world of difference you know!

His love of running shines through when he said to me in 1980:

"I guess what I really enjoy about running most is that I can run on a nice hot summer's day, perhaps on a Sunday morning, when everybody is still in bed. I go with my mates on a 22-mile run through the Bush and through the hills above Auckland about 2000 feet up where you can look right across the city, two harbours and over the sea. That is what most people don't get to appreciate. I enjoy racing and winning and competition, but it's the actual running that I can imagine doing for the rest of my life."

"The way I look at it is that life comes before running. I like going to the beach, I like sailing, playing golf, tennis and squash for fun. I like to spend time with my family and have a few drinks at the pub."



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