

A class of his own

Dr David Martin marvels at the unique talent of Haile Gebrselassie

In the Berlin Marathon on 30 September last year Haile Gebrselassie chopped 29 seconds from Paul Tergat's three-year old 2:04:55 marathon world record, set on the same course four years earlier. That achievement led many to suggest that Geb's career had now earned him the ultimate accolade: 'the greatest distance runner ever.'

He was already a two-time Olympic gold medalist (at 10,000m), and a four-time World Champion (at 10,000m). This marathon performance was his 18th IAAF-approved world record, over distances starting at 3000m, achieved during a period from 1994 through 2007. But he also had run faster than anyone else over seven other distances as well (see table). Racing the final kilometers alone in Berlin, with a spectacular negative split of 1:01:57 after a 1:02:29 first half, Gebrselassie demonstrated that the marathon distance was well under his control – especially on that day of ideal weather conditions (16C, overcast and no wind).

Just how fast is 2:04:26 in the world of marathon running? Those of us back in the pack find such a finish time for a marathon footrace rather unfathomable. One way of

appreciating it is to run one 4:44 mile after another, for 26 miles, plus a little farther to cover the remaining 385 yards. Those who do not run marathons may be able to visualize it in terms of pace per 400m – one lap of a standard athletics track. Run around that 400m track once in 70.8 seconds, and now do this 104 more times without taking a break, and you'll still be tied with Geb – but you'll have to continue onward at that pace for another half lap to the finish. [Equally amazing is that Paula Radcliffe raced at 77.0 seconds pace per 400 meters when she achieved her 2:15:25 world record at London in 2003.] That's endurance!

Another interesting question is: 'which of Gebrselassie's records is the best?' In order to compare each of the races, one must find a way to analyze 16 different combinations of running surface (road and track), environment (indoors and out), and distance (3000m, 2 miles, 5, 10, and 15km, 10 miles, 20km, one-hour run, half marathon, 25km, and marathon). The science of exercise physiology provides a tool for comparative assessment of the outdoor competitions.

When we exercise, our breathing



quicken and deepens. This brings oxygen into the working muscles and allows metabolism to produce energy for muscle movement. The largest volume of oxygen that can be absorbed and utilized is a quantity called VO₂-max. The units of this quantity are volume of oxygen in millilitres per kilogramme of body weight, per minute. VO₂-max is partly determined by genetics, partly by running efficiency, but also by training – running distances at a faster pace tends to raise one's VO₂-max. In top-class distance races, the men at the front all have VO₂-max values in the 70 to 90 range. Women are smaller in size and at the top end of performance have VO₂-max values from about 65 to 80 ml/kg/min. Without going into detail, prediction tables permit estimates of performance times achievable over various distances at

a wide range of VO₂-max levels. The right column in the accompanying table indicates the VO₂-max level required to achieve Gebrselassie's outdoor road and track performances.

Notice that Geb's 10,000m Hengelo performance in June of 1998, as well as his 5000m race two weeks later at Helsinki, appear to be his best efforts to date. Working at a metabolic rate (represented as VO₂-max in ml/kg/min) of 84.7 ml/kg/min, this brought finish times of 26:22.75 for 10000m and 12:39.36 for 5000m. Note also, however, that Geb's 2:04:26 at Berlin, despite being 29 seconds faster than Tergat's then existing record, required a slightly smaller VO₂-max value (82.4) than the 84.7 value for the two track performances. What do the performance tables say that Geb could have run for the marathon while working at an energy level of 84.7 ml/kg/min? The answer is an amazing 2:01.32

This value prompts one final question: Could Haile Gebrselassie become the first person to break the two-hour barrier in the marathon? Present-day charts using VO₂-max as a predictor stop at 85 ml/kg/min, which suggest a 2:01:10 marathon under ideal conditions. That would be a top-end improvement in performance capability required for Gebrselassie. Who knows? My prediction from analyzing mountains of marathon finish times is that this two-hour barrier will not be broken before 2015. And Geb will likely have retired before then. But his charismatic smile and effortless style of running will do much to bring the best out of his competitors as the next group tries to emulate this 'greatest distance runner ever.'

THE 25 WORLD-BEST PERFORMANCES OF HAILE GEBRSELASSIE

| DATE | VENUE | DISTANCE | TIME | RECORD STATUS | VO ₂ VALUE |
|-------------|---------------------|---------------|------------|-----------------|-----------------------|
| 04-Jun-1994 | Hengelo | "5,000 m" | 12:56.96 | IAAF | 82.5 |
| 27-May-1995 | Kerkrade | 2 miles | 8:07.46 | non-IAAF | 81.3 |
| 05-Jun-1995 | Hengelo | "10,000 m" | 26:43.53 | IAAF | 83.5 |
| 16-Aug-1995 | Zuerich | "5,000 m" | 12:44.39 | IAAF | 84.1 |
| 27-Jan-1996 | Sindelfingen | "5,000 m (i)" | 13:10.98 | IAAF | |
| 04-Feb-1996 | Stuttgart | "3,000 m (i)" | 7:30.72 | IAAF | |
| 20-Feb-1997 | Stockholm | "5,000 m (i)" | 12:59.04 | IAAF | |
| 31-May-1997 | Hengelo | 2 miles | 8:01.08 | non-IAAF | 82.5 |
| 04-Jul-1997 | Oslo | "10,000 m" | 26:31.32 | IAAF | 84.2 |
| 13-Aug-1997 | Zuerich | "5,000 m" | 12:41.86 | IAAF | 84.4 |
| 25-Jan-1998 | Karlsruhe | "3,000 m (i)" | 7:26.14 | IAAF | |
| 15-Feb-1998 | Birmingham | "2,000 m (i)" | 4:52.86 | non-IAAF | |
| 01-Jun-1998 | Hengelo | "10,000 m" | 26:22.75 | IAAF | 84.7 |
| 13-Jun-1998 | Helsinki | "5,000 m" | 12:39.36 | IAAF | 84.7 |
| 14-Feb-1999 | Birmingham | "5,000 m (i)" | 12:50.38 | IAAF | |
| 11-Dec-2002 | Doha | "10,000 m" | 27.02 | IAAF | 82.3 |
| 21-Feb-2003 | Birmingham | 2 miles (i) | 8:04.69 | non-IAAF | |
| 04-Sep-2005 | Tilburg | 15 km | 41:22 | unofficial | 82.3 |
| 04-Sep-2005 | Tilburg | 10 miles | 44:23 | non-IAAF | 82.8 |
| 15-Jan-2006 | Tempe | 20 km road | 55:48 | IAAF | 82.9 |
| 15-Jan-2006 | Tempe | 1/2 marathon | 58:55 | IAAF | 83.2 |
| 12-Mar-2006 | Alphen aan den Rijn | 25 km | 1:11:37 | no drug testing | 81.7 |
| 27-Jun-2007 | Ostrava | 20 km track | 56:25.98 | IAAF | 82 |
| 27-Jun-2007 | Ostrava | 1 hour run | "21,285 m" | IAAF | 82.3 |
| 30-Sep-2007 | Berlin | marathon | 2:04:26 | IAAF | 82.4 |

i = indoor

IAAF = world record as accepted by the International Association of Athletics Federations

non-IAAF = world best time over a distance not recognized by the IAAF

THE OPINIONS EXPRESSED IN THIS ARTICLE ARE THOSE OF THE AUTHOR AND DO NOT NECESSARILY REPRESENT THE VIEWS OF AIMS OR IAAF