

The Training Methods of Olympic 20 km Champion Ivano Brugnetti and Italian Race Walkers

In August 2004 Ivano Brugnetti added to his 1999 World Championship 50 km title winning the Olympic 20 km in a personal best time of 1:19:40 to join Ugo Frigerio, Giuseppe "Pino" Dordoni and Maurizio Damilano as an Italian Olympic race walking champion.

Brugnetti is one of a number of successful performers from the Italian race walking programme and this paper will examine the training means that have led to medal winning performances by Brugnetti, Damilano, Sandro Bellucci, Giovanni De Benedictus, Michele Didoni, Arturo Di Mezza, Giovanni Pericelli, Erica Alfridi, Elisabetta "Betty" Perrone, Ileana Salvador and Annarita Sidoti. In November 2004 Maurizio Damilano, Chairman of the IAAF Race Walking Commission and 1980 Olympic and 1987 and 1991 World 20 km Champion described the training methods of the Italian race walkers at a UK Athletics Race Walking Policy Support Team Seminar.

Technical preparation underpins all aspects of race walking training, as successful performance is a composite of effective technique (IAAF rule 230) and physical preparation. The training of the Italian race walkers applies the principles of marathon preparation developed by Canova and Gigliotti, who worked with among others 1988 Olympic Marathon Champion Gelindo Bordin. To this end training is geared to improving race walking biomechanics, i.e. develop economical technique; improving fuel efficiency in competition, e.g. through glycogen sparing; shift lactate threshold rightwards, i.e. increase velocity at lactate threshold; and develop physical and mental capabilities to tolerate the stress of maintaining race pace for well over an hour (Canova, 2002; Damilano, 2004).

Physical training sessions are divided into three areas to develop *aerobic power*, *aerobic resistance* and *specific resistance* using a variety of training methods outlined in Tables 1-3. Under this scheme *aerobic power* sessions describe a range of training to shift lactate threshold, e.g. "fast walk" and "long intervals" and aerobic power (maximum oxygen uptake) itself, e.g. "short intervals"(Table 1). These sessions could be described as quality sessions with aerobic resistance sessions as quantity (Canova, 2002). *Aerobic resistance* sessions are outlined in Table 2 and the key consideration is that these sessions are not performed at a slow pace! The final group of training is *specific resistance* training to establish and practice race pace sessions (Table 3). The work is completed with recovery training (slow pace), specific technique work, mobility exercises and strength training. Training intensities for individual athletes are established by track based testing on a monthly/six weekly basis in which blood lactate levels are measured during 5-6 incremental race walking intervals to establish individual anaerobic threshold. Organisation of weekly microcycles typically sees athletes following a pattern of one day hard, one day easy, two days hard, one day easy, one day hard, one day easy (Damilano, 2004). The hard training days are principally aerobic power sessions with one aerobic resistance session.

Aerobic Power							
Training method	Event	Distance	Interval	Pace per 1000 m	Work: Recovery ratio	Pace per 1000 m	
Fast walk	20 km w	5-10 km	NA	4:25-4:30	NA		
	20 km m	8-12 km		4:05-4:15			
	50 km	15-30 km		4:30-4:40			
Long intervals	20 km w	15-25 km	2000-5000 m	4:30-4:40	1:0.4/0.5	4:55-5:00	
	20 km m	20-25 km		4:15-4:25		4:40-4:45	
	50 km	25-30 km		4:25-4:35		4:50-5:00	
Medium intervals	20 km w	10-15km	1000-2000 m	4:20-4:25	1:0.5	4:45-4:50	
	20 km m	12-20 km		4:00-4:10		4:25-4:35	
	50 km	15-25 km		4:25-4:35		4:50-5:00	
Short intervals	20 km w	5-10 km	500-2000 m	4:00-4:10	1:1	Easy walk	
	20 km m	8-12 km		3:50-3:55			
	50 km	Not used					
Uphill walking (+10 % gradient)	20 km w	10-15 km	NA				
	20 km m	10-20 km					
	50 km	15-25 km					
Hill intervals (+10 % gradient)	20 km w	5-8 km	500-1000 m	NA	1:1	NA	
	20 km m	8-10 km					
	50 km	10-15 km					

Table 1. Training methods to develop aerobic power with examples of distances and pace for male and female 20 km athletes and 50 km athletes (Canova, 2002; Damilano, 2004).

Aerobic resistance						
Long walk	20 km w	15-25 km	NA	4:50-5:00	NA	
	20 km m	20-35 km		4:40-4:50		
	50 km	25-40 km		4:45-5:00		
Long walk with variations	20 km w	15-20 km	2000-5000 m	4:35-4:45	1:0.2	5:00-5:10
	20 km m	20-30 km		4:20-4:30		4:45-4:55
	50 km	25-35 km		4:30-4:40		4:55-5:05

Table 2. Training methods to develop aerobic resistance (Canova, 2002; Damilano, 2004).

Specific resistance						
Medium distance at race pace	20 km w	10-20 km	Race pace			
	20 km m	12-25 km				
	50 km	15-30 km				
Long intervals	20 km w	15-25 km	2000-5000 m	Race pace	1:0.4/0.5	Race pace +10 %
	20 km m	20-25 km				
	50 km	25-30 km				
Short intervals	20 km w	5-8 km	500-2000 m	4:00-4:15	1:1	Easy walk
	20 km m	8-12 km		3:45-3:55		
	50 km	Not used				
Special long walk at race pace	20 km w	Not used	Race pace			
	20 km m	Not used				
	50 km	30-40 km				

Table 3. Training methods to develop specific resistance (race pace) (Canova, 2002; Damilano, 2004).

Types of training	Pace per 1000 m	Annual Volume (km)
Continuous walking		
25-45 km	4:50-5:51	2000-2500
12-25 km	4:20-4:40	1000-1300
8-15 km	4:05-4:20	300-350
Interval		
Long (20-25 km volume)	4:15-4:25	150-200
Medium (12-18 km volume)	4:00-4:10	200-250
Short (5-10 km volume)	3:50-3:55	120-160
Variation, walking 2/3/5000 m		
Long slow (20-30 km volume)	4:20-4:30	130-200
Long speed (15-25 km volume)	4:05-4:15	250-300
Neuromuscular		
Continuous walking up hill	10-20 km (rhythm dependant on difficulty of gradient)	300-400
Intervals up hill (8-10 km volume)	Distances 500 or 1000 m, hard rhythm, HR 180-190 b.min ⁻¹	50-100
Muscular power work		
e.g. weightlifting		50-70 hours
Recovery		
For muscular regeneration	Slower than 5:00	1500-2000

Table 4. Training means and intensities of Italian 20 km athletes preparing for the 2004 Olympic Games (Damilano, 2004).

Training in the 2004 Olympic cycle

Table 4 details the breakdown of the different training intensities used by the Italian 20 km walkers (including Ivano Brugnetti) in the annual training cycle. To gauge how the actual training is periodised we will consider the actual preparation of the Olympic 20 km champion and the rationale of the 1999 World 50 km champion to step down in distance in his challenge for Athens in 2004.

Ivano Brugnetti: Periodisation of training in preparation for the 2004 Olympic Games

Ivano Brugnetti is 27 years old and started his career as a 50 km walker. In 1999 he placed 2nd in the 50 km at the World Athletics Championships in Seville but was upgraded to Champion following the disqualification for doping of German Skurygin (RUS).

In the four years following Seville Ivano failed to finish any of the five 50 km races he contested. After discussions with his personal coach Antonio la Torre and the FIDAL coaches Ivano decided to switch back to the 20 km distance, which it was felt he could tackle more successfully from a psychological perspective. Antonio La Torre is an exercise physiologist from the University of Milan and has coached Ivano since he was a young athlete. Ivano typically divides his training time between Milan and the Italian Race Walking Training Centre in Saluzzo, Piemonte where he spends about a week to ten days each month training with the rest of the Italian Squad. Gibbons (2004) recently highlighted

having training partners (a squad) to train with as a characteristic of many successful programmes across a range of winter and summer endurance sports.

In 2003 Ivano obtained some good but inconsistent 20 km results, finishing the season with a best time of 1h 20:40 and a positive feeling towards the following season. During the 2004 season his progress was evident starting in the winter, where he competed in the Italian Indoor Championships clocking a sub-19:00 5000 m. The following races confirmed his ability over the shorter distances:

- IAAF Race Walking Challenge 20 km, Tijuana (MEX), 3rd, 1:19:52 (personal best).
- IAAF World Cup of Race Walking 20 km, Naumberg (GER), 6th.
- Italian National Championships 20 km, 1st, 1:21:25.
- Italian National Team Championships 10 km, 1st, 39:26.
- EAA European Clubs Challenge 15 km, Cuneo (ITA), 1st, 1:00:53.
- IAAF Race Walking Challenge 20 km, Sesto San Giovanni (ITA), 2nd.
- Test competition 10000 m, Saluzzo (National Race Walking Training Centre) (ITA), 1st, 38:23 (Italian record).
- Olympic Games 20 km, 1st, 1:19:42 (personal best).

The training of Ivano Brugnetti, like the other Italian walkers, concentrates on the development of aerobic power and resistance managed with sports medicine and sport science support at regular intervals during the training cycle. Between November 2003 and August 2004 Ivano's total training volume was about 6000 km (Damilano, 2004), which averages out at about 140 km per week.

From November to January the training focus was aerobic resistance with a high training volume and specific strength training using up hill walking on mountain roads and weight training. Specific resistance was increased in February and the National Indoor Championship 5000 m was fundamental in ending this block of work on which the season would be based. Following a short period of active rest Ivano and other Italian squad athletes moved to the 2300 m altitude of Albuquerque (USA) in March to continue work on aerobic resistance and to end the training block competing in the seasons first IAAF Race Walking Challenge in Mexico. Ivano's 3rd place finish and personal best time behind Jefferson Perez and Robert Korzeniowski was a great confidence boost and a little unexpected. This demonstrated to Ivano that he was ready once more to use the aerobic capacities developed over years of training to compete in the lead group in international competition. He placed 6th in the IAAF World Cup of Race Walking at the start of May to back up the Mexico result with his performance planned to support the Italian team strategy (they placed 3rd). This performance was very important from the point of view of the coaching staff demonstrating the consistency of performance lacking in 2003. From this moment onwards training was focussed on the Olympic Games. Ivano returned to altitude twice more: in early June he spent 15 days with team mate Elisa Rigauda at 3500 m living in a mountain refuge. Each morning they descended to 1800 m for training on a flat circuit followed by an afternoon session of 50 – 70 minutes walking close to the refuge back at 3500 m (Damilano, 2004).

In mid June he placed 2nd in the IAAF Race Walking Challenge in Sesto San Giovanni demonstrating continued form before returning for a final altitude stint at the ski station in Sestriere with the rest of

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the Italian Squad returning to Saluzzo in July for final Olympic preparations (Damilano, 2004). The breakdown of the 2003 – 2004 training cycle is shown in Table 5.

Period	Means of work
October – January	Aerobic work and strength training
February	Specific resistance
March	Altitude work and competitions
April – beginning of June	Competitions
Beginning of June - end of June	Regeneration period and altitude work
July	Altitude work
August	Evaluation and competition - finish work

Table 5. Periodisation of training, Ivano Brugnetti, in preparation for the 2004 Olympic Games 20 km walk (Damilano, 2004).

Long term athlete development – Italy or Russia as a race walk model for UK athletes?

The three great race walking nations are Great Britain, Italy and Russia, although it is only the latter two who are producing truly World-class senior performers today. If we are interested in returning Great Britain to former glories then it may be useful to look at the characteristics of programmes that have produced successful endurance performers in a variety of sports, athletics in particular and race walking especially.

Tables 6 and 7 compare training microcycles for Italian and Russian athletes aged 17 years with very different workloads (Damilano, 1993; Morozov, 1996). The former "Soviet" coaches are proud of their "Russian methods" of preparation and when working for the IAAF at the Moscow Regional Development Centre in 2002 they challenged me as to why young British athletes did not train like Russians because "Russian race walkers are the best in the World"! There is some strong statistical evidence to support the Russian coaches – their athletes dominate age group championships, are prevalent in the senior World rankings and consistently figure on global medal podiums. Italy is similar society to our own and there are some similarities in talent development (Digel, 2002). Although Italy produces fewer junior champions than Russia it continues to produce senior champions.

The Russian republic of Chuvashia is a hotbed of race walk activity and 150 of the children of the Cheboksary Race Walking School paraded in front of 30,000 spectators in the Cheboksary Olympic Stadium at the opening ceremony of the 2003 EAA European Cup of Race Walking. Early specialization is seldom successful in endurance sports, especially in terms of retaining athletes (Gibbons, 2004; Smith, 2003), although it is an accepted characteristic in some countries (societies/cultures). The training of the Italian race walkers such as Ivano Brugnetti fits a more accepted (to our society/culture) model of long term development that undertakes event specialization from the mid- to late-teens onwards with a progressive increase in training load over a period of years. This model supports data suggesting that the years between 16 and 24 are the critical period for elite performance development and that 10 years or 10000 hours of deliberate practice is required to be competitive at international level (Gibbons, 2004; Gordon, 2003; Smith, 2003).

Training activities	
Day 1	10-12 km
Day 2	5-6 km "progression" + technique
Day 3	General and specific exercises, e.g. conditioning and mobility
Day 4	6-8 km incl. Intervals, e.g. 500 m
Day 5	10-12 km
Additional training in school holidays	
Day 6	Interval training similar to day 4
Day 7	4-5 km at race pace
Weekly volume of training	38/51 km

Table 6. Development Systems: Italy, training for 17 year olds (Damilano, 1993).

Training activities	
Monday	25 x 2 min, 1 min recoveries
Tuesday	20 km
Wednesday	Short x-c walk, indoor games
Thursday	10 x 1 km ~ 4.18.km ⁻¹
Friday	Rest
Saturday	5 km, 2 min slower than PB
Sunday	1 hour steady
Daily morning training	5 km jog
Daily evening training	5 – 10 km walk
Training camp competitions	U13: 10 km, 13+: 20 km
Weekly volume of training	160+ km

Table 7. Development Systems: Russia, training for 17 year olds (Morozov, 1996).

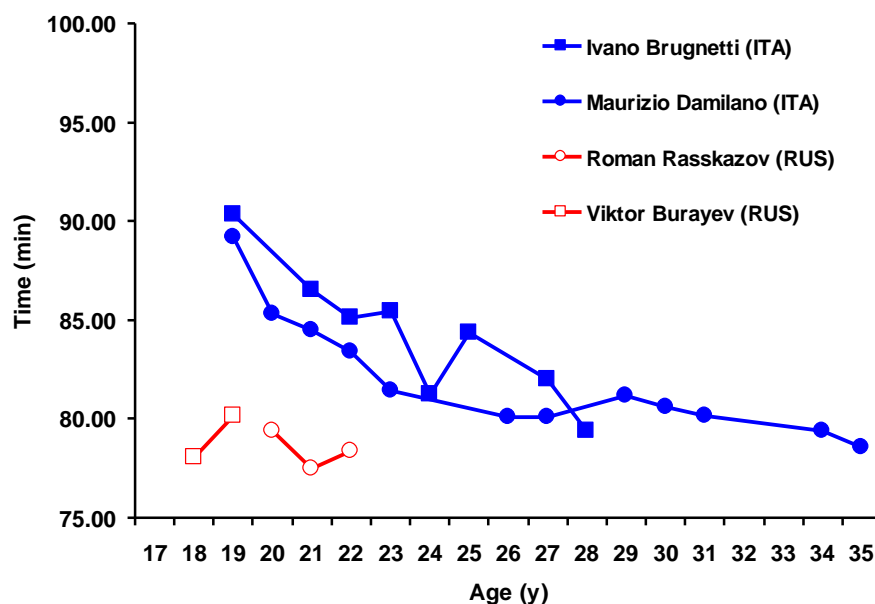


Figure 1. 20 km performance progression, Brugnetti and Damilano (ITA) v Rasskazov and Burayev (RUS).

Figure 1 shows the age related progression of the two Italian Olympic 20 km Champions and two of the Russian medallists from the 2001 World Athletics Championships. We can see the high level

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performances attained by the Russians in their teens and the later development of the Italians who at age 17 are working at 70 percent of the training volume of their Russian rivals. They hit breakpoint volumes of 140-150 km per week much later, which may explain why they struggle in age group competition. There was concern that Great Britain returned home empty handed from the World Junior Championships in 2004 and although the fact that some nations are happy to specialize early and load their juniors with what we may consider "senior" training volumes and so deliver "senior" performances does not explain all, it does help understand some of the differences in age group performance between nations. Some of the current developing British race walking talent demonstrates similar progression to the Italians and with two teams placing in the top ten in the junior races at the 2004 IAAF World Cup of Race Walking their should be some optimism for the event. Our challenge is to retain and develop talent based on sound endurance training principles with concomitant technical development.

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