Trainers, Coaches and Sports Scientists

A personal anthology
compiled by Ray Minovi

TRAINERS, COACHES AND MANAGERS have existed since the earliest-known days of sport. Among the Ancient Greeks, by the end of the fourth century BC, proper training programmes were in use, often based (like much modern training) on a four-day cycle:

Day 1 – preparation: short, brisk exercises
Day 2 – concentration: all-out effort to exhaustion
Day 3 – relaxation: rest and recovery
Day 4 – moderation: technical exercises to prepare for special events

The professional trainer became an important person. He was frequently a successful champion himself, and one of them, Iccus of Tarentam, is reputed to have written the first training manual, now unfortunately lost. Trainers knew that diet was important and ensured that the athlete's whole day was taken up by eating, sleeping and training. They understood the importance of psychology in winning races, identifying the 'ideal' athlete as one able to face hard work, having a healthy appetite, rarely ill and recovering quickly if he was. The importance of 'warming-up' was understood and a series of exercises, including running on the spot, was carried out before each event. There was also controversy. In his *De Ante Gymnastica,* Philostratus (third century AD) blamed trainers who indiscriminately applied hard-and-fast rules about diet and training techniques without regard to age or individual requirements.

The modern athletic era may be considered to have started in the nineteenth century. Training techniques had to be learned from scratch. The methods used to train prize-fighters are among the earliest recorded, and it is probable that they influenced training for athletic sports for some time. They were empirical, based on 'knowledge' which amounted to little more than old wives' tales, and many of the practices of Victorian times seem to us bizarre. There was by modern standards an over-emphasis on rest and on not exerting oneself too much until the race itself. A hundred years ago the workings of the body were little understood, and the science of nutrition had not yet been born. Eugène Christophe describes François Faber, winner of the 1909 Tour de France, eating six beefsteaks at a sitting, and the role of carbohydrate as the primary fuel for intensive exercise was unknown.

The public craze for endurance events and the introduction in 1896 of the modern Olympics fuelled a growing interest in training methods and by 1920 sports science, though not yet in its infancy, is at least recognisable in embryo.

Bergstrom, J.
In a famous study (an expansion of the 1939 work of Christensen) in 1967 Bergstrom and colleagues showed that athletes fed on a high-carbohydrate diet took 2 hr 50 min to cycle to exhaustion on an ergometer, compared with 1 hr 44 min on a normal mixed diet, and 1 hour on a low-carbohydrate diet.

Bobet, Louison
An 'adrenalin' rider in his early career, Bobet changed his training methods and diet radically after meeting Fausto Coppi. With his soigneur Raymond le Bert he adopted what was for the 1950s a scientific approach to training and diet,

avoiding a range of foods harmful to athletic performance. He also trained over the time rather than the total distance of the next important race. A book, *En Selle* (1955), written in collaboration with Le Bert, outlined his methods and approach.

Burke, Edmund
Burke's approaches ranged from the sound, based in solid experience and good science, to improbable flights of fancy. The first edition of his *Serious Cycling* advocated huge mileages even for non-elite riders, and these were drastically reduced in a second edition. Nevertheless, largely because he was a New Worlder, he acquired more influence than he perhaps merited. Some of his more interesting work was published in short articles in *Velo News*.

Carmichael, Chris
Coach to United States national teams, and to Lance Armstrong since 1990, and therefore an influence on contemporary training methods, Carmichael shows a typical American mix of traditional and innovative approaches. Uses some modern technology, particularly the HRM, weights, stretching, and the periodisation of training. Some of his methods show imagination and flair, others are ordinary and uninspiring.

Cavanna, 'Biagio'
The blind soigneur of Fausto Coppi. He kept a *pension* in Lombardy where many Italian racing cyclists came on early-season training camps. He was an advocate of hard work and plain, wholesome nutrition and was a great believer in massage. Issue 3/97 of *Coaching News* carried an interview made in 1953 with an account of his approach and methods.

Cerutty, Percy
Australian coach of the 1960s. A disciple of the methods of Paavo Nurmi (qv), he advocated a complete and demanding training regime designed to bring the athlete to an unbeatable condition of supreme fitness. This included such revolutionary ideas as running over sand dunes. His successes include the runner Herb Elliott, winner of the 1500 metres at the Rome Olympics, and the cyclist Russell Mockridge.

Christensen and Hansen
In 1939 two Danish scientists did a crossover study of low carbohydrate, moderate carbohydrate, and high carbohydrate diets, each lasting one week. At the end of each diet, the subjects rode to exhaustion on a stationary bicycle. Compared to the mean endurance time on the low carbohydrate diet of 81 minutes, the subjects on the high carbohydrate diet were able to ride for 206 minutes.

Conconi, Francesco
Sports scientist of the late 20th century. Conconi came to prominence in 1984-85 when he guided Francesco Moser to a new Hour Record. He was an innovator in the scientific testing of athletes, and his development of the ramp test led him to propose a 'deflection' indicated by blood lactate levels, visible on graphs showing the athlete's performance. The existence of this so-called 'Conconi point' is disputed by many sports scientists. Probably an early user of EPO, Conconi was investigated during the 1990s by the Italian police under suspicion of having diverted research funds into buying and selling performance-enhancing drugs to cyclists and other athletes. Michele Ferrari (qv) was his student and colleague.

Coppi, Fausto
Winner of two Tours de France and five Giri d'Italia, plus numerous classics, three world titles, and the Hour Record, despite losing his best years during the Second World War, Fausto Coppi had great natural talent which he augmented by a training regime that was very advanced for its time. It included long training rides (up to seven hours a day) followed by long periods of recovery, and there was an emphasis on diet. Coppi started each day by drinking a mixture of fruit and vegetable juices. His careful regime enabled him to recover quickly from a number of serious accidents, and to enable

him to compete until his late thirties. During his early career he was aided by his blind soigneur Biagio Cavanna.

Ducazeaux, Sauveur
A former Tour de France rider (19th in 1937), his guiding of the little-known outsider Roger Walkowiak to victory in the 1956 Tour de France is often evoked as an illustration of the difference effective management, particularly psychological, can make in the success or otherwise of an athlete. Walkowiak was naturally reserved, likely to become over-anxious, and Ducazeaux sought to conceal from him until the last possible moment the knowledge that he might win.

Ferrari, Michele
Sports doctor and coach. In a career in which he introduced a number of interesting approaches to training for road racing, he was pursued by controversy over the use and supply of drugs. As team doctor with Gewiss in 1993, he compared the dangers of EPO to orange juice if taken in large enough quantities and was sacked. He remained private adviser to a number of leading riders, including Tony Rominger, who broke the World Hour Record twice under his guidance, and Lance Armstrong. In 2004, following a long investigation by the Italian judicial authorities, he was convicted of sporting fraud but later cleared on appeal on the grounds that too long a period of time had passed. Ferrari believes that coaching is both science and art, and insists that the coach must work with the whole person, not just the athletic component. His *velocita ascensionale media* ('average climbing speed') method is a novel and effective way of assessing the progression of a rider's fitness.

Joe Friel
Another influential American coach who appears superficially innovative, but whose advice is in fact fairly traditional. *The Cyclist's Training Bible* is generally good, except for his extreme views on nutrition (he advocates the Palaeolithic Diet). *Cycling Past Fifty* is an excellent guide, not only for veterans, but also for younger riders.

Genzling, Claude
Innovative French writer on cycle racing and training, associated with Bernard Hinault, with whom he wrote ***Road Racing.*** Interesting ideas on position and gearing.

George, Walter
Victorian athlete who set a record for the mile of 4 min 12 seconds on grass in 1886. Over a twenty-year career he evolved training methods which influenced British athletes right up to the Second World War and included the following features:

- training was frequent, twice a day during the running season
- training was not excessively strenuous
- training was specific – if George wished to run at a pace of 65 seconds per lap, that was the speed he trained at
- rest before races.

Gerschler, Woldemar
The first coach to use interval training for top-class track athletes, Gerschler developed his system in conjunction with heart specialist Herbert Reindel (who had used interval training to treat heart patients), and laid down its principles. Gerschler devised the system of short intervals of fifteen seconds or less, with recovery periods equal to, or not more than twice as long as, the effort interval.

Keen, Peter

A successful junior pursuiter, Keen became British cycling's leading sports scientist in the late 1980s and 1990s as head of department at Bishop Otter College in Chichester. He was a pioneer in the use of heart-rate monitors and fluid replacement, and his work was the basis of the British Cycling Federation's table of Four Levels of Training Intensity. His most famous 'coachee' was Chris Boardman, whom he guided to victory in the 1992 Olympic pursuit, and thereafter to world titles and the World Hour Record. Meticulous preparation and a planned tapering period before the key event were features of their approach. As the architect of British Cycling's World Class Performance Plan Keen must take a major share of the credit for BC's track successes in World Championships and Olympic Games since the mid-1990s. In 1999 he was awarded the Mussabini Medal (qv) for achievement at world level.

Kohlemainen, Hannes
The first 'Flying Finn', Kohle-mainen, at the age of only 22, won three gold medals in the 1912 Stockholm Olympics, setting a new world record for the 5000 metres 25 seconds faster than it had been run before. In 1920 he won the Olympic marathon in 2 hrs 32 minutes, unprecedented at the time. A farmer used to spending hours every day on foot, he was no simple peasant: he read and studied the training methods of other leading athletes and added them to his own year-round conditioning programme.

Konopka, Peter
German doctor who published in 1981 Cycle Sport from Beginner to Expert, a comprehensive manual for competitive cyclists marketed in the UK as The Complete Cycle Sport Guide. Although the sections on equipment have been superseded by subsequent developments, it remains an excellent all-round guide, particularly strong on physiology, nutrition and training.

Le Bert, Raymond
Physician noted as the soigneur of Louison Bobet, the first winner of three consecutive Tours de France. Le Bert was something of a pioneer in techniques of training, nutrition and body care. In 1955, with Bobet, he published a training manual, ***En Selle***, much of which is still relevant today. Bobet adopted the system, novel at the time, of training over the time he expected to race, rather than the distance. His recommended diet avoided traditional French food, like paté de foie and rich sauces.

Magne, Antonin
Winner of two Tours de France (1931, 1934) and the World Road Championship. A great time-triallist, he won the first time-trial stage in the Tour de France (1934) and the Grand Prix des Nations three times. After the war he became *directeur sportif* to the Mercier team, where he employed relatively scientific methods. He discouraged any familiarity from his riders and was always addressed as Monsieur Magne. He personally supervised his riders' meals, even to removing the soft (less digestible) bread from baguettes, and regularly took their blood pressure. Eggs were forbidden on race days. He regarded a racing cyclist as 'a liver surrounded by some other bits and pieces.'

Mussabini, Sam
The trainer of Harold Abrahams, winner of the 100 metres in the Paris Olympics of 1924, Mussabini's innovative contributions to scientific training were largely unknown until the release of the film Chariots of Fire. The child of Italian/Arab parents, he was ostracised by the establishment, and as a paid coach regarded with suspicion by the authorities, who ignored his contribution and tried to prevent his involvement. Mussabini was the first to use movie film as a training aid. He coached eleven Olympic medallists, including (uniquely among coaches) winners of the 100 metres and 1500 metres. He wrote a definitive work on billiards, worked with several London football clubs, and trained cyclists at Herne Hill. In 2000 he was inducted into the National Coaching Foundation's Hall of Fame. A medal is awarded in his name to coaches for outstanding achievement at world class level.

Naessens, Gus
Belgian 'soigneur' of the 1980s and 1990s, Naessens was typical of the unqualified quacks who brought the word 'soigneur' into disrepute - the UCI eventually abolished its official use. His methods were more suited to the training of horses than human beings and included putting cattle feed in his riders' bottles to give them a feeling of being 'full'.

Nurmi, Paavo
The best known of the 'Flying Finns' of the first half of the Twentieth Century, Nurmi developed intensive training techniques. From 1920 to 1924 he trained twice a day, around 7 miles plus some sprints in the morning and a 2 - 4 mile run in the afternoon, raising the pace over the last mile. He increased the intensity of his training progressively, used a stop-watch to regulate his pace, warmed up for 30 minutes before races, wore a sweat-suit before and after, and had regular massage. He never smoked or drank spirits. In his 26-year career he was rarely beaten, and won a record total of nine Olympic gold medals. In 1932 he set a world marathon record of 2 hrs 22 minutes. At one time he held all world track records from 1500 to 20,000 metres.

Saris, Wim
Sports scientist who, with colleagues, carried out an important study into energy demands in the Tour de France, establishing that on some days in the high mountains, demands could reach 9000 calories, outstripping the rate at which they could be replaced.

Soens, Eddie
Former sergeant-major, effective and self-taught coach, originally of boxers and runners, who found and developed a number of successful British riders in the 1960s, 70s and 80s, including Dave Lloyd and Chris Boardman. His methods were never written down, but his greatest talent seems to have been first in identifying talented riders and then in motivating them and building up their confidence and self-belief.

Voet, Willy
Another of the unqualified Belgian 'soigneurs' who used dubious and, eventually, criminal methods to obtain success. With the Festina team in the 1990s he injected his riders with cocktails of drugs, including amphetamines, human growth hormone, steroids, EPO, and other substances. He himself acted as guinea pig to test the effects of clenbuterol, a steroid used to fatten beef cattle, concluding that it was excellent. In 1998 he was arrested while transporting the team's drugs, including EPO, to the Tour de France, imprisoned, and banned for life. He tells 'his' story in his book, ***Massacre à la Chaine*** (1999), subtitled 'Revelations from thirty years of cheating'.

Warburton, W. G. 'Choppy'
A self-styled trainer of the late 19th and early 20th century, Warburton flourished in a period of apparently insatiable public demand for ultra-endurance tests like six-day non-stop walking races. There can be little doubt that Warburton gave his athletes drugs, the commonest of which was strychnine: 'If his charge showed any undue sign of distress, out came the black bottle, the contents of which seemed to act like magic on the distressed rider.' In 1896 Arthur Linton, a young man in his twenties, won Bordeaux-Paris under Choppy's guidance, dying two months later of typhoid; but stories spread that Warburton had poisoned him, and he was eventually warned off the tracks.

Woodard, Dr Christopher
Dr Woodard was a contributor to the weekly magazine ***Cycling*** in the 1950s and published a best-selling (among cyclists) small book in 1953 called ***Scientific Training for Cycling***. It wasn't scientific by any standards and is weak on nutrition. Its primary emphasis is on leading as far a possible a 'natural', healthy life-style, avoiding excess in anything. The book includes contributions from leading cyclists, including Reg Harris.

Zatopek, Emil

Wrongly identified by many people as the originator of interval training, the Czech runner was a leading proponent of intensive interval training (devised by Gerschler, qv), and of methods similar to those of Nurmi and Cerutty, which enabled him to win the 5000 and 10,000 metres and the marathon in the 1952 Olympic Games. He also won the 10,000 metres in the 1948 Games and by 1954 had won 38 consecutive races at the distance.