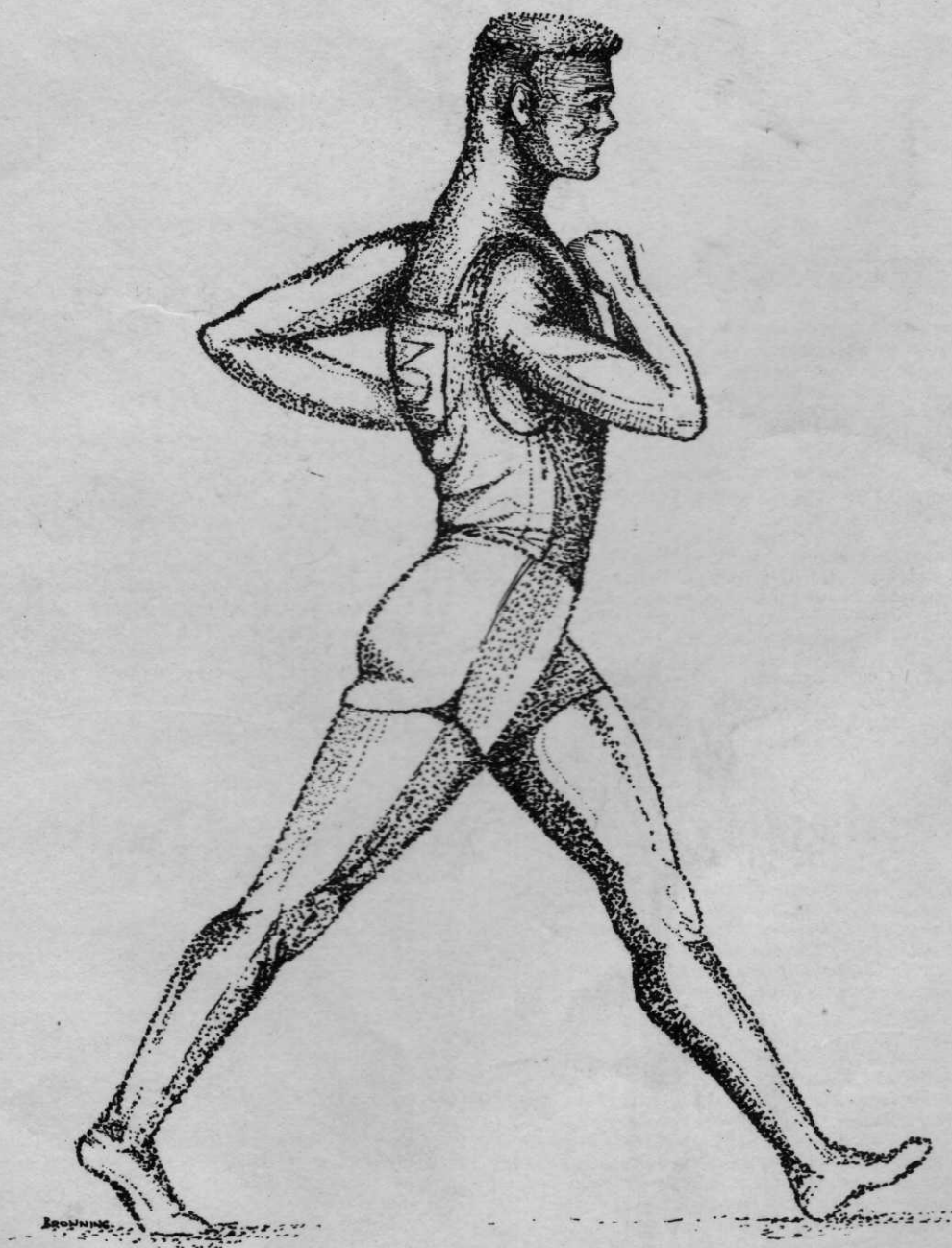


TRAINING for RACE WALKING



Frank McGuire

Training for Race Walking

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Foreward

In this present age of specialists, an athlete, to be the best in any sphere in his chosen sport, must sacrifice a great deal, and spend a considerable amount of time in assimilating the knowledge which zealous students of athletics have accumulated over the years, and have committed to paper.

The contents of this booklet are the results of thorough research by Frank McGuire, and contain the training secrets of many of the world's leading walkers, as well as important information on style training.

I feel that no greater appreciation of Frank's work could be shown than by putting into practice the lessons to be learned from a study of the methods of the masters outlined herein, as well as recommending the purchase of this booklet to anyone interested in our particular branch of the athletic game.

A. E. Robinson
Chairman of the Race walking Commission of the Amateur Athletic Union of Australia.

Introduction

The present day advancement in amateur athletic performances is often credited to improved training techniques and the comparison of these techniques by athletes and coaches all over the world. This booklet is aimed at bringing to race walking the benefits of the training techniques of leading walkers. It has been compiled from questionnaires which I distributed among walkers.

Although these are the training programs of champions, I would like to point out that they should only be used as a guide. There are no two people who train exactly alike, and each individual should select a training program suitable to his own physical and mental make-up. Important factors to be taken into consideration are age, ability to recover, and type of employment. If a man is working hard manually he will find that a tough schedule will take its toll; a student studying hard will also use up much energy and must consider this aspect before blindly tackling a set schedule. If your daily work involves a lot of walking, by all means count it as part of your schedule. Ability to recover can be determined by experience, or in comparison to the individuals normal pulse rate. The actual time of recovery before commencing another part of a training

schedule can be measured as the time taken for the pulse rate to drop a pre-determined amount. This subject is treated in more detail in this booklet under "Training for Juniors" and "Low Pulse Rate Breaks Records".

It is the development of ones own training techniques over the years, and the build up of powers of endurance, that enables a walker to stay in top class competition against the up and coming youth. This is particularly exemplified by the great John Ljunggren who in his fourth Olympics at Rome finished a brilliant second in the 50 kilometers race. This aspect of the sport of race walking enables athletes to enjoy many years of good healthy exercises in challenge against others.

Over the last few years much has been written on the merits of repetition training, resistance training on sand, and weight training. It is interesting to note that former Australian champion, Bert Gardiner, used all these methods back in the mid-1920's. Bert also had regular pulse checks taken, used the stop watch for pace judgement, and trained eleven times weekly during the mid-summer each year. He regularly took part in running events (much to the horror of the experts of his day) and was a great believer in calisthenics as an aid to flexibility.

Training methods vary the whole world over. World record holder Josef Dolezal (Czech) and John Ljunggren (Sweden) both utilize running as part of their preparation. By contrast the English champions Ken Matthews and Don Thompson keep strictly to walking in order to achieve their results.

I would like to thank the walkers who contributed so readily, and all my Victorian Amateur Walkers Club friends who have helped in the preparation of this booklet. A special note of thanks goes to my son, Frank, who became just as interested in this project as I. In behalf of walkers everywhere may I thank Track & Field News for putting this material into print.

Frank McGuire
Chief Walking Coach of Australia.

Training Techniques

INTERVAL TRAINING:

Interval training is used by many leading walkers as the means of developing both stamina and speed. It involves continuous repetitions of fast and slow walking over a predetermined time and distance. Probably the most commonly used interval workout is the 440 yards at a fast pace followed by a 440 yards recovery at slowpace. Other combinations range from 220 yards with 110 yards recovery, to one mile with 880 yards recovery. The combinations used depend on the fitness of the individual and the distance of the event for which he is training. The 440 yards workout is used as a basis for speed and stamina training for all distances ranging from one mile to fifty kilometers, while the longer workouts from 880 to one mile are generally only for the longer distance races. The length of the recovery distance is determined by the individuals experience and as he becomes fitter the distance can be shortened. The pace at which the fast section is walked is normally aimed at 90% effort with the recovery section at a brisk strolling pace. The number of repetitions again depend on the individual, varying from 8 to 25 for 440s and usually about 4 to 5 for 1 miles. Training continuously over a set distance at a set speed has the benefit

of teaching the walker good pace judgment which is most important, particularly for the long distance races. The other major advantage of this type of training is that the athlete is disciplined in his training by having a set target and is thus able to obtain greater benefits from the training.

REPETITION TRAINING

Repetition training consists of a series of walks over a predetermined distance in a set time with a minimum rest period between repetitions. It has the same advantages as interval training in improving speed, stamina, and pace judgment, but it is a more concentrated form of training. It places more emphasis on continued fast pace with minimum rest, thus giving the athlete that little extra needed for sustained pace in long walking events.

Walkers using this training method usually vary the distances during a week's workout, ranging from say 440 yards repetitions to 880 yards or 1 mile repetitions. This provides diversity to the training program and also assists in judgment of different pace. An evening's workout could consist of say six 880s at four minutes with a rest interval of two minutes. The rest interval is the time taken to recover normal breathing. This can be assessed fairly accurately by taking the pulse rate after a fast workout and finding the average time taken for the pulse rate to fall to a steady level. This subject has been covered in some detail under "Pulse Rate Checking" in the article "Training for Juniors". The athlete can alternately determine his recovery time by trial and errors. He will find that if the time used is too short he will have to strain to complete the repetitions in the set time. This could be harmful if carried out frequently so it is advisable to have the recovery time too long rather than too short. As the walker finds he can do the set number of repetitions in the set time without much effort, he can then either increase the number of repetitions or increase the speed. The pace should be kept below racing speed, or alternately, the distance should be less than that which would be covered at racing speed. For example the walker could do 1 mile repetitions at three-quarter pace or 440 yards repetitions at mile pace.

Repetition training is an extremely rigorous method which can produce good results if used correctly. Because of the attention to details entailed with measurement and timing, and the danger of misuse, it is advisable that the training method be used in coordination with an experienced coach. Also the newcomers to this method should be careful not to neglect style in an over emphasis on speed.

FARTLEK

Fartlek, meaning "speedplay", is a Swedish method of training for distance. Its development is generally credited to Swedish National coach Gosta Holmer, and it was used with great success by Gunder Hagg and Arne Andersson. The technique has spread throughout the world and has since been adapted by many walkers as a method of developing the powers of endurance needed for the long distance races. A typical workout for a walker could consist of (1) Warm up with jogging and calisthenics. (2) 2 miles of fast strolling over undulating country. (3) A few 100 yards wind sprints walking. (4) 5 miles stroll at approximately 5½ to 6 miles per hour, breaking occasionally into short fast bursts. (5) Uphill run for 100 to 200 yards. (6) Finish off on grass track (bare feet if softgrass) with a few intervals.

This schedule is best used over undulating country such as parks, golf courses, or country road, which encourages natural changes of pace, and provides the challenge of tackling uphill gradients.

A similar training system known as "Power Training" has been developed in Australia by noted coach Percy Cerutti, and it has been used with success by several Australian Olympic walkers. It consists of blending training over sand dunes and beach with weight lifting and surf swimming and generally living the life of a stotan (a phase coined by Cerutti from the words "stoic and spartan").

Whether the athlete uses fartlek, power training or other similar techniques depends largely on the countryside near his home, however it is the basic principle of using the natural undulations of the countryside to bring about variations in pace and effort that enables the athlete to undergo a long training session which is interesting by its diversity and beneficial by its rigor.

Fartlek could form the major part of the early road season training and could be practised say once a week regularly right through the season. For the long distance walker who needs many hours of hard training, fartlek can be an extremely useful addition to a training program. It is also noteworthy that several of the walkers included in this book use parts of the fartlek schedule combined with fast work in their training. Hill walking, running interspersed with walking training and long striped spins with occasional short bursts, are all used to advantage.

RUNNING

Running as part of training for walking is becoming more widely accepted as it is adopted by leading walkers throughout the world with success. It has been a fallacy that mixing running with walking has a detrimental effect on style and speed, but modern training methods have shown that on the contrary it can be beneficial. Combining running and walking in training has the important effect of exercising all the muscles of the legs in the correct capacity. If running is neglected entirely certain muscles are neglected while others are exercised until the athlete reaches a stage where disturbing ankle and shin soreness is developed. This is probably due to the continual contracting of certain muscles, instead of the two way stretch which the muscles undergo in normal conditions. Flexor and extensor muscles are antagonistic. When one contracts, the other relaxes. Another advantage of including running in the training schedule is that respiratory capacity and general fitness can be improved without developing the style trouble which can arise with continuous all out wind-sprint walking.

Continental walkers favor both running and skiing as a major part of maintaining physical fitness during the off season. Many carry running throughout the main training period in smaller quantities, sometimes as part of a fartlek workout. Russian walkers usually finish off a hard interval training workout with a 2 to 3 kilometer run.

As in other branches of sport such as the jumping or throwing events, running can be an important part of the training schedule, but it must be regarded in its correct perspective with the main focus of training on the specialised event.

STROLLING

Strolling is the term used in race walking referring to walking with an easy rhythmic action at a moderately fast speed. It can form part of any training program from 1 mile to 50 kilometers, and this issued extensively. Most walkers make it a regular part of their training schedule to include a stroll every Sunday or on Saturdays when not racing. A week-end stroll has the advantage of being a respite from the hard evening workouts and the grind of the working week. A stroll in the hills, along country lanes, or by the banks of a river on a quite Sunday afternoon enables a man to enjoy nature and the elements to the full and makes it so much easier to put the necessary miles under the belt.

For the short distance walker strolls of 5 or 6 miles can be beneficial, but as the racing distance increases so does the strolling. Walkers training for 50 kilometers stroll up to 6 hours a fortnight or so before racing. Pace may vary from 4½ to 6½ miles per hour depending on the ability of the athlete and the distance. Some walkers like to stroll in light slacks and sweaters, while others prefer to strip to racing gear. This of course is affected by the time of the year and local weather conditions.

Strolling is particularly useful to the distance walker, who has to remain on his feet longer than a marathon runner. Long periods of strolling are thus essential for the walker to become accustomed to thinking of breathing and relaxation in long races. He is also able to practice changing pace and style pattern and to ease fatigued muscles while still walking at speed.

Race walkers have a fortunate advantage over other athletes in that every step taken in their normal daily routine is assisting their training. Miles accumulated in lunch time strolls, or in walking to work in the morning, all help in building up a foundation for racing, and should be taken into account when planning an overall schedule. Whether in the early morning, lunch time, evening or on Sunday afternoon, strolling is essential to the walker.

Training for Junior Walkers

by Frank McGuire

For a number of years now, athletic associations through the world have placed emphasis on developing junior (under 20 years) track and field athletics as a means of considerably raising the general standards. However, until recently there has been comparatively little encouragement for junior walkers.

It is essential that an athletic program should cater for all branches of the sport, including walking, so that junior athletes can find by their own experience the events for which they are most suited. The general advantage of having this opportunity at an early age is that the athlete can have the benefits of technique and experience behind him when he reaches full maturity. The particular advantages to walking of teaching technique at a receptive age are that it leads to a general improvement of walking styles as well as a greater respect for judging discipline. To receive the full advantages of beginning race walking as a junior, it is essential that the athlete learns to understand the basic principles of good style, and carries out his training program wisely. In order to achieve these aims it is desirable that the junior athlete should have a coach who can advise him on training programs and corrections in style.

As a guide to the junior walker I have set out below the fundamentals of style and general conditioning. These and the section on "Coaching Junior Walkers" may also be of assistance to the all-round track and field coach who does not have a specialized knowledge of race walking. The section on "Pulse Rate Checking" is included as a comparatively recent method of training control which can be of definite benefit to the athlete but which should be used under the supervision of an experienced coach.

STYLE TRAINING:

Style of walking is purely individual depending on the skeleton frame, posture, flexibility, and muscular strength. Refinement of style can be increased however by practicing walking at moderate to fast speeds.

Requirements - One of the main requirements is to have great flexibility at the hip joints. By using the hips correctly the forward leg extends further, and a longer stride is obtained; as a result, minimum energy is exerted. By maintaining the torso at a constant level and keeping the feet close to the ground at the end of the stride, movement in a straight line is also ensured. Greater hip flexibility can be obtained by doing exercises practised by the high hurdlers, and general calisthenics. The hip action, when mastered, will give the walker the feeling of "walking with the hips". There should be no forced side to side action, but rather a feeling that the torso is sitting on the pelvis.

Correct Posture - Good posture in walking can assist greatly in combating fatigue and together with the carriage of the arms is largely responsible for governing the speed of the leg action. At the full stride, or double supporting phase, the body should be perfectly upright against gravity. During the forward stride the "apparent lean" may be noticed, but should never be more than 5 degrees except when walking up-hill. It is natural to lean slightly backwards when negotiating a down-hill grade.

The legs - To walk correctly, the foot must land heel first, the knee locking soon after contact and remaining firm until the opposite leg which has now been carried forward lands. If the hip action has been properly mastered the feet will travel in a straight line, but care must be taken in the early stages that no criss cross action takes place. It is best to "make haste slowly".

The arms - The purpose of the arms is primarily one of balance; they should be carried to suit the body structure of the individual. Any drive should be directed back rather than forward, with the closed hand (not clenched) reaching a spot about level with the opposite breast during the forward swing. Most walkers carry the arms at an angle of 90 degrees but this can vary depending on the leg length of the walker.

The shoulders - As we are endeavoring to carry the body on a low plane, it is essential that the shoulders are not lifted high

or become "joggy". A jogging shoulder can lead to a rising hip and broken contact with the ground.

Relaxation - Walking being more or less a test of speed and stamina it is most important to avoid tension as much as possible. However at time tension is hard to recognize and it is good practice to walk for short distances, opening and closing the hands, contracting and relaxing different sets of muscles alternately until one has the feel of relaxed muscles.

GENERAL CONDITIONING:

The aim of general conditioning for a junior is to prepare him for his immediate racing, but in doing so he is also building his body towards maturity. The relative muscular development of the body at adulthood is considerably affected by the type of exercises carried out during the teenage years. Thus the form of the general conditioning should be such that the athlete receives an all-round development.

For walkers of the 13-15 years old group I would recommend they mix their walking training with other branches of athletics. They should not take any particular one too seriously at this age but aim at enjoying athletics generally, and developing technique. The walking training should consist of track workouts twice a week covering approximately 2 miles at each session, and in addition 3 to 5 miles long strolling once per week. The long strolling at about 4 to 4½ miles per hour pace can form the basis for both road and track racing. For track training the warming up period should include calisthenics and slow jogging followed by ½ mile of style training. The rest of the workout could be either repetition or fartlek style or a combination of both. The average expected mile time divided by four should form the basic time for the fast laps. This type of training can take the younger teen-agers up to distances of 4 miles in racing if the race program is built up gradually.

The 16-18 years old group can afford to take their walking training more seriously although still mixing it with running and other branches of athletics. The same basic training as the under 16 years age group can be followed with modifications. The distance of the long strolls can be increased with age and body development and the track workouts can be increased to 4 nights weekly for a period of an hour each night including warming up. With this training the athlete can race up to 5 miles. For road racing there should be more strolling and less emphasis on track work.

After the age of 18 years the comparative success of the walker depends on early or late maturity. With early body maturity the walker can now tackle a training program that will bring him to championship standard at a comparatively early age. We have recent evidence of this with several Russian walkers achieving international successes in their early twenties and Noel Freeman of Australia gaining a Silver medal at Rome at the age of 21. The training program that an athlete adopts at this stage of reaching maturity depends entirely on his own physical and mental make up and the experience of his coach. The training schedules in this booklet are aimed at assisting the athlete in selecting the schedule which will be of most benefit to him.

Another important feature of general conditioning is the development of upper body strength. Percy Cerutti, famous Australian coach, advocates upper body strength as a requirement for power running and his coaching successes seem to confirm this theory. I consider all round body strength to be equally important in walking. This strength can be developed by the use of weights or body resistance exercises. Walking itself is a resistance exercise and workouts over sand dunes, beaches and hills during the early season training will develop both strength and endurance. However, for all round scientific development there is nothing to beat weight training. Weight training exercises should be done with a tigerish movement, with the emphasis placed on upper body, abdomen and legs. Commence all weight training workouts with a few free standing exercises and for general toning up before commencing the heavier work. In the early stages of weight training workouts should be done two or three times weekly, gradually reducing both workouts and exercises as the season approaches. The all the

year walker can do weight training in the early part of the season, tapering off as the longer distances approach. Suitable exercises for a walker are military press, press behind neck, curls, flying exercises and jumping half squats. See illustrations, (Note-8X8X8 means three sets of eight repetitions with a rest between each set). Sit ups, with or without weights, are recommended. Select the poundage that will permit the correct number of repetitions to be performed in the correct style, and add to the poundage when the number of repetitions becomes easy. Rest between each set of repetitions until breathing becomes normal. These exercises with a limited number of repetitions, are designed to develop muscular strength rather than muscle size.

COACHING:

It is often found that a track coach has the sole responsibility for the training of a group of athletes such as in a school or a small club. This coach has usually developed a sound all-round knowledge of track and field athletics but frequently it is found that his knowledge of race walking is limited. If he wishes to assist a junior athlete in becoming a race walker, it is important that he realizes that though literature on the subject may appear involved, the basis is that the walker looks like a "walker". The only basic differences between race-walking and street-walking is that in the former the arms are bent to shorten the arm swing, and the hips are rotated to extend the stride and keep the body on a low plane.

When the athlete is first introduced to race walking, he should be asked to do a few laps of the ground in his ordinary street walking style, as if he were hurrying for a train. The coach should then correct faults, one at a time, as they become apparent. The first instructions would probably be for the athlete to correct his carriage to an upright position, as the tendency for the novice is to lean forward. Next he can bring his arms to the bent position for greater ease of movement of arms and legs. By making full use of his knees and ankles he can now extend his stride.

The next step is to develop the correct flexible hip movement. A good method of achieving this is to stand upright with the feet together and move the hips in a backwards and forwards rotation without moving the shoulders. When this is mastered continue the same movement but as the left hip goes forward bend the left knee so that the body is sitting on the right hip with the right knee locked to take the weight. Continue to rotate the hips so that the right hip goes forward with the right knee bent and the left knee locked. This action should be practiced until movement is smooth and co-ordinated. The walker should now attempt to practice this action while walking briskly. He must remember that as the weight is on one leg the body should rest easily on that hip, while the other hip is moving forward with the leg reaching out to complete the stride.

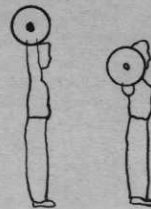
The action of race walking can be usefully taught to most athletes to assist them to become more flexible in the joints, and as an aid to co-ordination of movement. In a less exaggerated form it is a completely natural movement which is disappearing due to the excessive use of motor transport and the tendency of the modern youth to rest on his skeleton frame against the nearest wall. By standing upright and walking with a free hip movement the athlete will improve carriage and probably his athletic performances. A well known college coach in Melbourne insists that all the boys learn the movements of racewalking before doing other track and field events, and the marked improvements in performances seem to vindicate his teachings. The idea is not so strange when one considers that flexible hips are so necessary for hurdle events and field games. In running too, a significant pointer is that Wilma Rudolph, who has a remarkably flexible hip movement, is the outstanding woman sprinter in the world today.

Assuming that the athlete has mastered the basis of the race walking style, then his actual training becomes important. General conditioning has been previously covered and here the coach will take the usual precaution to see that the athlete does the correct training to suit the race and the individual. A certain amount of training time will be taken up in style grooving - that is a few laps concentrating on the elements of good style. Important points to watch are an upright carriage, even distribution of the stride (i.e., the body should be midway between the front heel and the rear toe at full stride) and correct locking of the knee. The knee should be locked for as long as post-

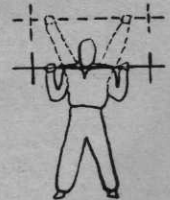
ble during the period that the leg is supporting the body. This supporting phase is from when the heel strikes the ground until the toe leaves it. Thus at full stride the body should be equally supported by both legs. The feet should point directly ahead and if the correct hip rotation is used, the points of contact with the ground should be in a straight line.

When the coach is called upon to advise the walker on the fairness of his style, he should endeavor to keep in mind the I. A. A. F. definition of walking. -Walking is a progression of steps so taken that unbroken contact with the ground is maintained. The advancing foot of the walker makes contact with the ground before the rear foot leaves the ground. During the period of each step, in which a foot is on the ground, the leg shall be straightened (i.e., not bent at the knee) at least for one moment. The competitor may be cautioned when by his mode of progression he is in danger of ceasing to comply with the definition of contact. The definition is based on the mechanics of walking and is phrased such that a walker can be disqualified if he loses contact with the ground or if his leg action is such that he is in danger of losing contact. High speed cine films have shown that any deviation from the correct style can lead to occasional or even continual loss of contact which will give the walker an unfair advantage over his competitors. Figs. 1&2 (p.11) are consecutive pictures taken at 64 f.p.s. The interval between these shots is less than 100th of a second, and in this period contact may or may not have been achieved. This illustrates that it is often extremely difficult for a judge to determine whether a walker is in actual contact with the ground at every stride. Thus it is imperative that the walker maintains the correct style so as not to raise doubt in the judges mind.

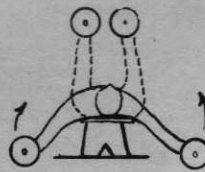
Weight Training Exercises



Press behind neck.
8 x 8 x 8



Military Press
8 x 8 x 8



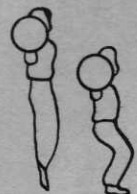
Flying Exercise
8 x 8 x 8



Two hand curl
8 x 8 x 8



Sit-ups
4 x 10 x 15



Jumping half squats
10 x 10 x 10

Technique for Race Walking

by Ruddi Toomsalu (Estonia)

The IAAF rules define race walking as progression by steps so taken that unbroken contact with the ground is maintained. The advancing foot of the walker makes contact with the ground before the rear foot leaves the ground. During the period of each step, in which a foot is on the ground, the leg shall be straightened (i.e. not bent at the knee) at least for one moment.

It has been observed that by ordinary walking, wherein the length of a step is about 32 inches (82 cm.) an increase in the number of steps to 190 in a minute (i.e. more than three steps in a second) inevitably results in running. To avoid running, a different walking style has been introduced, whereby the frequency of the steps has increased even to 220 in a minute (i.e. about 4 steps in a second). At the same time the length of the steps has increased to 47-51 inches (120-130 cm.), and results have been reached that seem to be superhuman for an ordinary walker. One must walk briskly to cover one kilometer within 10 minutes, but the Swede, V. Hardmo, the owner of the 3,000 meter world's record of 11:51.8, did it in 3:57.2.

Walking is a process of pushing the body out of balance, while it is supported over one leg and of then bringing the swinging (driving) leg forward in time to prevent the body from falling. This process is repeated with every step by an increasing force until the desired walking speed is achieved. One must remember that forward propulsion is due only to the fact that the extensor muscle forces of the leg apply at the ground in an oblique direction and not in a strictly vertical direction only. (Fig. 1)

For analyzing walking movements it is sufficient to remember that one might divide the action of legs into three phases: 1)the swinging phase, 2)the supporting phase and 3)the double phase.

THE SWINGING PHASE. In the swinging phase the forward pendulum movement of the leg is facilitated by the great mobility of hip joint and occurs largely under the influence of gravity, so that very little muscular action is necessary. It is also essential that the limb be slightly flexed, by shortening the leg almost one-ninth of its entire length to prevent the toes from touching the ground.

The swinging phase starts at the moment the toes get off the ground, and at the end of this phase the heel touches the ground. The duration of this phase is 0.415 sec. (assuming that the duration of the double step, i.e. the entire period in which the limb covers the swinging and the supporting phases is one second).

During the swinging phase the muscles of the leg are held relaxed, to get ready for the exertion which is waiting in the following phase, when they are being used first as restraining, then as propelling forces.

The swinging phase might be divided into (a) posterior period, in which the limb is moving from the ground to the vertical line of the center of gravity of the body, and (b) anterior period, in which the limb swings from the vertical line to the point of landing.

THE SUPPORTING OR PROPULSORY PHASE. The moment when the heel touches the ground, marks the beginning of the supporting or propulsive phase, which ends at the take-off moment, when the great toe leaves the ground.

As long as the supporting leg assumes a position ahead of the vertical line of the center of gravity of the body, the limb acts as a restraining force (not as a propulsive force), and this interval might be called the anterior or braking period.

After that moment, when the head of the femur assumes a position in front of the heel, the posterior or propulsive and forward pushing action of the supporting legs comes into effect.

The time of the supporting phase (0.575 sec.) is always longer than the swinging phase (0.415 sec.), being increased by slower walking, and decreased by faster walking. As the walking speed increases, the closer these times come to each other. However the supporting phase never becomes shorter than the swinging

phase. Here lies the fundamental difference between the walking and running: In running the swinging phase is always longer than the supporting phase!

THE DOUBLE SUPPORTING PHASE. Between the two above named phases exists a transitional phase or double supporting phase. This is a space of time of 0.081 sec., when both legs are in contact with the ground. This phase almost disappears when walking is performed with the utmost velocity, namely when the walking borders on the mechanics of running.

RACEWALKING. As soon as we increase our walking speed to the maximum limit, we are confronted with the shortcomings of ordinary walking. We might observe that the basic difference between the slow and the fast walk lies in the height which the two heads of the femur are carried above the ground. The higher they are, the shorter must be a single step, since the leg can remove itself only slightly from the vertical position. When they are in a lower position (fig. 2, P.2), then the pendulum from forward to backward has a larger amplitude. This coincides with the length of the step. But we know this is associated with bending the knee joints to a greater degree, and that such a low position of hip joints produces a great and tedious burden on the thigh muscles. And now, to reduce that tiresome muscular effort, and at the same time to keep the hip joint in a low position, the head of the femur of the swinging leg is brought downward and forward by a circular movement, with respect to the head of the femur of the supporting leg, (fig. 2 p.3). The pelvic bones in the hip girdle can do this, with a very slight movement of the spine. Such a downward-forward rotating movement of his hip joint guarantees an extensive movement for the swinging leg. When executing the hip movement correctly, the walker will feel that he is "walking with the hips", and using his legs as extensions.

At the same time the up and down oscillation of the head and trunk disappears, as the supporting leg remains locked from the knee and the head and trunk are always kept at the same height, thus maintaining a constant center of gravity, and the extra burden of the thigh muscles becomes minimized.

Such a walking style is uncomfortable and unfamiliar when training is started, as the hip muscles get tired very soon. But such fatigue disappears after a few training sessions as the unfamiliar movement becomes familiar.

The feet should land with an almost straight inner side as this gives the advantage of correct balance through the toes.

The heel is the first part of the foot that makes contact with the ground. The take-off occurs over the great toe, whereby the toes are pointed outward for a few degrees.

The length of the steps is highly personal, depending mainly upon the height of the body and legs, the looseness of the hip girdle, and the take-off force. For example, the famous Latvian walkers, P. Zeltins and A. Kruklins had the same length of the steps, in spite of a great difference in their heights 5'6" (168 cm.) and 5'11" (180 cm.) respectively. But Zeltins possessed very loose moving hips, which gave him added stride-length.

The arms with clenched fists swing powerfully up and right across the chest to the front of the opposite shoulder. The arms are held bent at the elbows at approximately 90 degrees, and as each fist reaches his highest point, the other drops back in rear of the hip.

For learning and perfecting his walking style, one should stress certain items, one by one. For example:

1. To develop the relaxed movements of legs and shoulders, the walker should walk slowly about 30-40 minutes.
2. In stressing take-offs, it is recommendable that the hands be kept down by the sides.
3. Keep the hands to side position when seeking to perfect rotary movements of the hip girdle and landings, heel first.
4. To improve shoulder action, place a 3-foot length of wood-pole, one inch diameter, on the back, held in place with

front of elbows, and walk with prolonged steps while stressing the swinging of the shoulders. Keep the head and body upright at the end of each stride.

THE TYPICAL FAULTS OF WALKING TECHNIQUE. 1. Hands are carried in a too high position. Such a position is usually connected with high lifted shoulders, and when walking fast the shoulders tend to perform "jogging" (bounding) movements, making the competitors eligible for a "caution of running", as the knees begin to lift high and contact with the ground in broken. In such a case, encourage a more directly forward drive with the arms.

2. General or partial muscular tension. One should perform stretching and loosening exercises, and long walks with relaxed muscles daily.

3. Exaggerated lateral movement of hips (correct is forward and downward). This is usually connected with a sideward inclination of the trunk. An exaggerated side to side hip swinging will destroy balance, cut down the effective stride, and impose greater stress on the abdominal muscles.

4. Passive, hanging arms by sides. Arms should swing back and forth in the same rhythm as legs. Passive arms tend to produce lateral sway of the upper body and lateral forward-downward swinging movement of hips.

5. The trunk, due to fatigue or of some other reason, inclines forward some 10-15 degrees. As a result, the hip girdle sinks backward, strides become shorter, and by trying to keep a high walking velocity one might easily start running. In every workout one should control his body stance, by trying to keep his hip girdle in an erect position.

6. Excessive lengthening of steps (a) When in the forward pendulum movement the leg is overextended, or (b) when in the supporting phase the supporting leg is forced to remain on the ground too long. This over-extending or over-stretching action is beyond the walker's capacity, and he exaggerates the turn of his toes outward at the moment of take-off. Thus, the take off becomes weaker, and very often, by trying to keep his walking velocity, springy steps are introduced which lead to running.

7. The swinging leg is brought forward through with a movement which is too high. As a result, the supporting leg very often leaves the ground, before the swinging leg touches the ground. This fault is mostly due to an excessively high hip action in a forward direction. The knee lift, and vigorous drive of the supporting leg, would produce a lifting tendency in the trunk and consequent loss of contact with the ground. This condition demands a retarded supporting leg break, if continuous contact is to be maintained.

8. Walking with bended knees. This is caused by (a) a feeble and defective take-off movement. The supporting leg must not break at the knee prior to the front foot landing, as there is danger of general loss of contact, especially if any spring is also imparted through the calf at the same time, (b) the swinging leg is grounded before a full extension is reached from the knee, (c) the hip girdle is continuously held in a backward position,

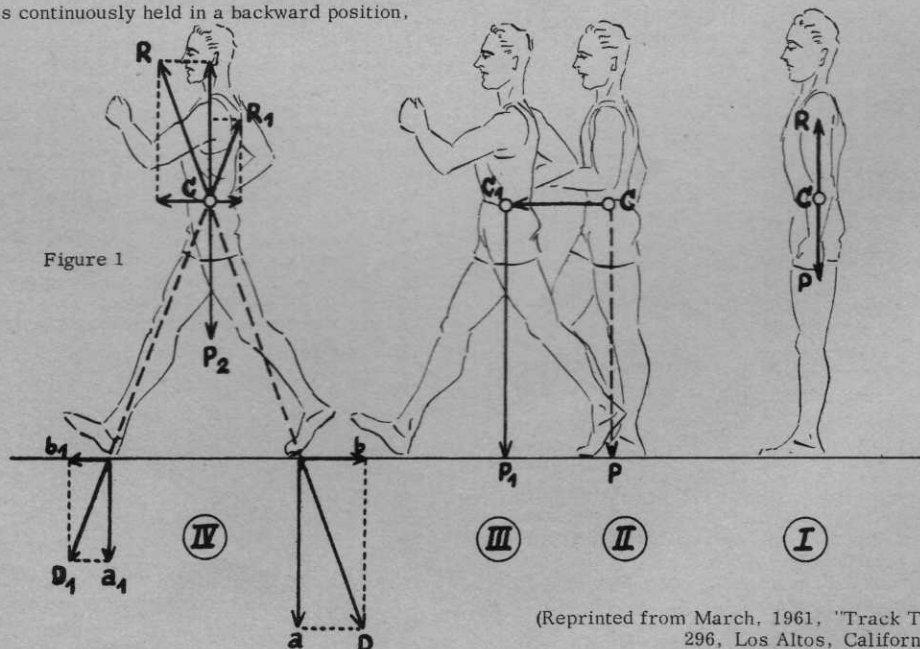
(d) just a moment before the landing of the swinging leg, the hip of the supporting leg is falling back from its erect position, and as a result the steps become short and the landing is performed on the sole, but not heel first, or (e) the total contractile force of the anterior part of the leg muscles (the extensors) is too feeble for the extension of the knee joint, or the posterior muscles of the leg (the flexors) are too short and rigid and do not permit full extension which enables the knee joint to reach its natural extended position. The hurdler's exercise, by using both hands for pressure on the forward knee, will help to stretch thigh ligaments and muscles, and concentration on the supporting knee lock when walking will show an improvement. 9. The swinging leg is extended too early in the air before the landing. A delayed landing follows in a jerky manner which may injure the heel. While the landing is delayed, the supporting leg leaves the ground before the swinging leg touches the ground, and running movements are introduced. The swinging leg should be extended exactly at the time of landing, but not sooner or later.

FIGURE 1. In the standing position, the erect body is in a state of equilibrium, as its center of gravity (C) is directly above its base of support (I). Usually the line of gravity falls about 1½" (4 cm) in front of the center of the ankle joint. There is equilibrium between superincumbent weight (P) and the counter pressure from the ground (R), ti means that P equals R.

The step forward from a standing position is initiated by an alternation in postural tonus. The tonus of the extensor muscles of the foot and flexors of the leg is diminished, allowing the body to topple forward slowly. At the moment when the center of gravity has passed forward beyond the supporting base of the supporting leg, the balance of the body is lost, and the knee of the swinging leg is flexed and lifted forward (II and III). When the swinging leg touches the ground it displays a restraining action, and in the double supporting phase the superincumbent weight (P) is now locating in the middle of the legs (P₁).

In this position the pressure against the ground is divided between the vertical directions of "a" and "a₁", and of oblique (horizontal directions of "b" and "b₁" (IV). The faster the speed of walking, the greater is the pressure against the ground, and the friction makes the underlying surface a firm point of application.

The resultant force of "D", composed for the forces "a" and "b" is equal to the propelling force of body (R). At the same time the resultant force "D₁", composed of the forces "a₁" and "b₁", is equal to the restraining force of the body (R₁). As the propelling force "D" is greater than "D₁", then the speed of the walking is dependent upon the strength of the take-offs, and from the angle of the take-off being greater when the application time (duration) of the restraining force "R₁" is as short as possible.



(Reprinted from March, 1961, "Track Technique", P.O. Box 296, Los Altos, California.)

Training in the USSR

The spectacular rise to success of Russian athletes since their entry into international competition is partly due to the thoroughness with which both coaches and athletes approach their sports. This applies equally to race walking where Soviet athletes have drawn world wide attention to their training methods by their many successes in international events.

The main features of Russian training for walkers are the intensive use of the stop watch, the attention to detail of all items of training, and the great quantity and diversity of training. The stop watch is used for most workouts in early and main season training, for interval training, time trials, or to measure the "tempo" of the individual (i.e. the number of paces per minute). The pace of every workout, whether it is 100 meters intervals or a 20 kilometers time trial, is thought of in terms of the pace needed to reach a planned time for the individual's main event at the peak of the season. Continuous records of all training times are made as a check on progress.

Attention to detail is applied to warming up, diet, special walking exercises to promote flexibility, medical check-ups, and general body fitness. Gymnastics calisthenics and other sports such as basketball, skating, and skiing are also used to promote flexibility and body fitness. A movement highly recommended to strengthen knee joints is walking over undulating country going uphill freely and downhill tensed (locking knees). The diversity of training helps the walker maintain a fresh mental approach. During the off-season walking is kept to a minimum with lots of skiing. Running is mixed freely with most training workouts and a fartlek like workout in the woods is used frequently. However the greatest emphasis is placed on a maximum amount of training. Even with intensive training methods it is still considered necessary to train at least 5 days per week. This is in addition to regular early morning walks which amount to more than one-quarter of the total training distance for leading Soviet walkers. It is noteworthy that V. Ukhov covered more than 5,000 kilometers in training for the 1954 European Championships 50 kilometers which he won.

A year's training involves a gradual building up from strolling to fast walking. Winter training includes taking up the sport of skiing to its full capacity to exercise the legs while having a virtual break from walking. However even in this period morning strolls and runs are included to the individuals discretion. In the spring a large amount of cross country running is included in the morning sessions while long strolling and easy paced road training is the basis of the main workouts. This is built up to medium paced walks on road and track, and fast interval training in the summer. The autumn sees a tapering off to include long hikes and hunting trips in the country. Typical year round training schedules for 20,000 meters and 50 kilometers are shown below.

TRAINING FOR 20 KILOMETERS

Preparation Period

1st Day Walk---exercises in gym (play basketball etc.).

2nd Day Track (or road) training (winter time run on flattened snow, or on track in a few inches of snow, 1 to 2½ hours to own satisfaction).

3rd Day Continuous walk at easy limit.

4th Day Rest.

5th Day Skiing on undulating country up to 4 hours medium pace with some fast bursts of 1 to 2 kilometers.

6th Day Rest.

7th Day Skiing on hills and flat for 30 to 40 kilometers, including 8 to 10 kilometers at high speed, until you feel the strain of your efforts.

Early Season

Mon. Rest.

Tue. Interval training on road or track building up from 5-6 X1,000 meters at 4:30 per kilometer to 10 to 15X1,000 meters at 4:35 per kilometer, followed by fast spin of from 3 to 10 kilometers at 4:45 to 4:50 per kilometer.

Wed. Varied workout of walking, running, in woods, exercises, running, jumping, and javelin throwing.

Thu. Rest.

Fri. 1st Week-20 to 25X200 meters with 200 meters recovery

and 20 to 25X100 meters with 200 meters recovery, followed by 3 to 4 kilometers style training, finish up with 1 to 2 kilometers run. 2nd Week-15X200 meters with 200 meters recovery, and 20X100 meters with 200 meters recovery. 3rd Week-50X100 meters at 21 to 21 seconds with 100 meters recovery, 2 to 3 kilometers run. 4th Week-2 to 3X400 meters, 5 to 6X200 meters, 10X100 meters, 10X50 meters, 3 to 4 kilometers run. Sat. 1st Week-20 to 25 kilometers varying fast and slow walking and running, 5 to 7 kilometers easy run. 2nd Week-15 to 16 kilometers on road at 4:50 to 5:10 per kilometer with fast 1,000 meters every 3rd kilometer. 3rd Week-20 to 25 kilometers easy run in woods. 4th Week-5 kilometers at 4:45 per kilometer, 3 to 4 kilometers easy run. Sun. 5 to 6 hours walk in woods.

Main Period

1st Day Repetitions of 1 to 8 kilometers, 8 to 18 kilometers at medium pace on road or track.

2nd Day Active rest, i.e. mixed running and walking in woods at discretion.

3rd Day Rest.

4th Day 50X100 meters or 20 to 40X200 meters, or 10 to 30X400 meters.

5th Day Fast repetitions of 1, 2, 3, 4, or 5 kilometers of 16 to 25 kilometers on road with 1,000 meters fast sections, or 20 to 25 kilometers mixed running and walking.

6th Day Rest.

7th Day Repetition 50, 100, 200, or 400 meters at very fast pace.

Transition Period

Long hikes and hunting trips in the country.

TRAINING FOR 50 KILOMETERS

Preparation Period: As for 20,000 meters.

Main Period - Summer months June, July, and August.

1st Day 30 kilometers in June, July period extending to 45 kilometers during August prior to a 50 kilometers race. There are three methods of training: A. Medium pace throughout. B. Slow beginning but increasing to medium pace with strong finish on the last 2-3 kilometers. C. Medium pace but with fast kilometer at the end of each third kilometer.

2nd Day Active rest including fartlek style in woods 1½ hours.

3rd Day Rest.

4th Day A. June, July. Repetitions 100, 200, and 400 meters at speed. B. Mixing race style and strolling with lowered arms, including 200-400 meters sprints. C. Stripped spin with 20-25 sprints from 200-300 meters, or 20-25 x 400 meters at 1:43 per lap, plus 200 to 400 meters slow recovery. From July onwards include longer speed workouts-For example: 1 kilometer fast with racing style, plus 2 kilometers slow at either normal gait or race walking style. Repeat 8-10 times.

5th Day Take note that emphasis is on speed this day using a variety of walk actions on a distance of 25-30 kilometers. For example: 3 kilometers warm-up with run-like walk, followed by 5 kilometers fast race walking style and 3 kilometers slow run to recover. Then 2 kilometers walking (big strides) with lowered arms. 5 kilometers fast race walking and 2 kilometers slow recovery run, then 1 kilometer slow walking. Complete workout with 2 kilometers race walking style at set speed, finishing with 2 kilometers very fast.

6th Day 4-6 hours stroll in woods, or over hills and country.

7th Day Rest.

Diet:

A substantial meal prior to any event over 1½ to 2 hours is recommended. A liquid refreshment used by most Soviet walkers in training and in competition consists of strong tea made with hot water (not boiling), adding 250 to 300 grams of sugar per liter and the juice of 4 or 5 lemons. After drinking rinse the mouth out with plain water or swallow a mouthful of water.

(This article is from "Race Walking" compiled by D.I. Kozlovskim, Trainer of Light Athletics of U.S.S.R., published in 1955.)

Correction of Faults

by S. Lobastov

Honored Master of Sport. U.S.S.R. 50 kilometers world record holder

The basic requirement in the walk is continuous contact with the ground. In other words, the leading foot must touch down before the trailing foot leaves the ground. Failure to pay attention to this aspect of walking leads to a violation of the rules and can mean a disqualification of the athlete.

In order to avoid this error it is necessary to master correct habits of technique right from the very beginning of your race-walking career. By studying movies of the best walkers you get the most complete picture of the correct walking techniques. In watching these movies pay close attention to the position of the legs, arms, pelvis, and the whole trunk.

There are many causes of errors in race walking but we will deal here only with three of the most common ones.

1. "LIFTING" OR LOSS OF CONTACT WITH THE GROUND:

a. "lifting" due to not "locking". This error occurs when the athlete, without completing the pushoff and before setting the swinging foot on the ground, prematurely removes the supporting foot from the ground. Correcting this mistake is easy; do not remove the pushoff foot from the ground until the leg has completely straightened at the knee and the lead foot has been set down on the ground.

b. "lifting" due to too rigid hip action: "Lifting" also occurs when the leading foot is carried forward and is not set down in front of the leading leg but rather underneath it, at the moment

of contact. When this happens the length of the stride is shortened by 4'-6". It is recommended that the pelvis be turned (swung) at the same time the step is taken. This increases the stride length and provides a better control for timing the removal of the supporting foot from the ground.

c. "lifting" due to vertical hopping: This is the result of a vertical variation of the body's center of gravity, and is caused by the walker pushing off in an upward rather than a forward position. To correct this it is necessary to discontinue working on speed for a while and to walk with a long, sweeping stride, observing all the technical rules of walking.

2. "SHUFFLING" FROM FOOT TO FOOT:

This comes about when the athlete, at the moment of the pushoff and before setting the leading foot down, carries this foot over to the side, causing a raking type of motion in the foot, often leading to a loss of continuous contact with the ground. This error is corrected by taking a longer stride and keeping the toes of the rear foot pointed straight ahead at the instant of pushoff.

3. NOT LOCKING WHEN GOING DOWNHILL:

To correct this, train on hills, trying especially hard to lock. Carry the arms lower when going downhill - higher when going up.

It is possible to check on walking movements by various methods. For example, specially wired shoes with a light that goes on if contact is broken.

(From Soviet Sports Journal "Track & Field" June, 1960. Translated by Gar Williams, USA)

Diet for the Walker

The subject of diet is most controversial and the study of training programs herein will show how even the food and drinks taken during a long distance walk vary considerably with each individual. This is understandable when one considers how body weight, style of walking, speed of walking and temperament can alter the calorie requirements of each and everyone of us. For instance a walker of heavy build traveling at about 4 miles per hour on a level surface would require about 360 calories per hour while a lighter person traveling at the same speed would require much less. Walking up hill would increase the requirements and if walking down hill there would be a decrease.

Environment and custom also play a large part in dietary habits and by looking over our training programs again we can see a wide variety of pre-race meals. Josef Dolezal favors chicken and rice, Ron Crawford prefers grilled lamb, while Eric Hall says "strangely enough bread and jam". However the later may not be as strange as it seems according to R.C. Hutchinson, D. Sc. (Melb) in "Food For Better Performance": "There is an argument in favor of the last meal before an athletic event of limited duration consisting largely of carbohydrates, unless the interval between the taking of food and the athletic performance is considerable, in which case appreciable amounts of fat should be included because of its high satiety value. The advantage of a carbohydrate meal would stem not only from a possible increase in physical efficiency resulting from carbohydrate but from the speed with which ingested carbohydrate, particularly sugar, is absorbed, and the benefits to be derived from having ample supplies of stored glycogen. Perhaps jam could be spread on bread in place of butter, and greater use made of such foods as bananas and dried fruits".

In the article "Training For Walking In the U.S.S.R." mention is made that a light refreshment used by most Soviet walkers in training and in competition consists of strong tea made with hot water (not boiled). It is interesting to note Dr. Hutchinson's comments on the value of tea and coffee: "When consumed in moderate amounts, tea and coffee are valuable adjuvant foods. Each contains small amounts of one or more substances that can promote the increased flow of gastric juices, reduce or postpone fatigue, improve morale and generally promote a sense of well-being. In addition, any sugar, milk or cream

that is added would provide additional calories as well as small quantities of some other nutrients. Both may be taken hot or cold enabling them to be consumed with almost equal popularity during winter and summer.

In a normal balanced diet there is usually an adequate supply of vitamins for an average working day, but for an athlete attempting to follow a strenuous training schedule it is sometimes advisable to supplement certain vitamins in tablet or drop form or food rich in the vitamins required. Vitamins A and D can be obtained from fish oil, Vitamin B1 from wheat germ, and Vitamin C (Ascorbic acid) is contained in oranges, lemons, grapefruit and several vegetables and other fruits. There is some evidence that overdoses of Vitamin C taken before an endurance test such as a 50 kilometers walk tends to give quick relief to fatigued and aching muscles that often accompany such work. The extra vitamin intake should commence some weeks before the race and continued during the events. Care must be taken when taking Vitamin D in concentrated form as it can cause a toxic condition if taken in larger than the prescribed dose.

Perhaps the most important meal of the day is breakfast and it should supply at least one-fourth of the calories needed for the day. If morning and afternoon tea is taken it is better to split the normal luncheon into three parts rather than ever eat inferior foods. In Australia an evening dinner is the main meal of the day, supplying most of our needs in calories, vitamins, etc. As a precaution against cramp in longer events walkers are advised to add extra salt to their diet and this can be added to the evening meal as a condiment. Some athletes who sweat profusely have to take salt during the event.

Glucose sugar can also be taken to advantage during a long event and is available in tablet form as a single unit or combined with salt. Glucose can also be taken after a distance event and it is thought that the benefit derived in this case may not be due to the additional energy provided but rather to the effect of raising the blood sugar level on the central nervous system.

(Reference: "Food For Better Performance" by R.C. Hutchinson, "Vitamins For the Swimmer" by Harry Gallagher, "Athlete and Coach" July, 1959.)

Low Pulse Rate Breaks Records

by Brian Connor
From "Heel and Toe" Australia

This is the result of a survey of walkers pulses by one of our members in 1959

The normal resting pulse is 72 per minute (60 when sleeping) whereas it was found that the pulse rates of some of our champions was about 50 (Note: Noel Freeman 50, Don Keane 52, Alan Hancock 48, and also Herb Elliott 46, Merv Lincoln 45.) This theory was confirmed in a three miles race when those walkers with lower pulse rates definitely walked faster times than those with more "normal" pulses.

At the end of the same race, every athlete's pulse was 180 per minute. Thus if there is a maximum heart rate, the slower rate increases a greater number of times to the maximum than the normal rate does during a race. This means that more blood is pushed through the body per minute by the champion and more oxygen is supplied to his muscles. Science has proved that if the normal heart beat faster than 190-200-per minute there would not be time for it to fill again between beats.

Pulse Rate Checking

The use of pulse rate as a method of measuring "recovery" after exercise has been shown recently to have definite benefits in preventing overwork of an athlete. In Australia Franz Stampfl has been prominent in using this method of control of training of his athletes, and Derek Cole of England studied control of this type in relation to juniors who are beginners at the sport. Derek Cole has detected in pulse recovery measurements three distinct stages in a beginners training. They are:

- (1) There is often (but not always) an initial period of some weeks when the boy's pulse recovery will be very slow and unfavorable.

- (2) There is a second stage of about a year or more when the pulse recovery (under normal conditions) takes a short and regular time. If the boy is asked to run repetition 440s in 75 sec., this second stage almost always shows the following characteristics: The pulse will return from its maximum (about 30-32 in 10 seconds) to a rate of say 20 in 10 seconds, in about two minutes. It will then remain on the "plateau" of 20 seconds for a longish period of about half an hour before dropping further. Repeated 440s in 75 seconds will have no ill-effects on the speed of recovery, that is to say the pulse will return to 20 in two minutes after the 15th repetition just as it will after the first. Some boys at this stage recover to a "plateau" of 19 or 21 but very few deviate from the normal 20.

- (3) There is a third stage when after the "plateau" has stayed at 20 for a year or so, it starts dropping down and may become as low as 14 over the years.

I have conducted some tests with walkers and have found the results to follow a similar pattern. The correct use of pulse ratings for an athlete can have four important effects.

The first is the prevention of overwork due to either excessive racing, disease in the incubation stage, or other causes of strain. Day to day slight variations in the "plateau" will naturally occur, but any variation from say 20 to 24, will probably be due to one of the above causes. These causes of strain could

WALKING DOES NOT CAUSE ARTHRITIS

by Brian Connor From "Heel and Toe" Australia
Walking does not cause arthritis - at least not any more than other sports. This was the conclusion reached by Ray James, Queensland medical student and Intervarsitywalk champion, in a survey carried out last year.
James interviewed 31 former walkers throughout Australia - only seven had experienced even slight suffering from osteoarthritis. Osteoarthritis is a degeneration of the cartilages in any joint.

Oxygen is the important substance required by the body to keep the muscles functioning in long distance races. In all events, no matter what distance, the pulse gets to its maximum very early to keep this supply going.

After a short race however, the pulse returns to normal quicker than after a longer one. This is because, during the race, waste products are formed. These are oxidized by oxygen when the race is over, and the longer the distance the more waste products are formed.

The pulse should return to 120 within two minutes of each hard training walk. If it does not, some coaches advise discontinuing that session.

Many good walkers have normal pulse rates but to be a world record-breaker, it seems essential to have a low pulse rate. However, the normal pulse rate can be reduced by hard training. This makes the heart stronger; improves the circulation to the muscles and increases the reserve sugar supplies in the muscles. You might like to try these theories out yourself. Note, however, that many good athletes have low pulse rates and do not break records.

otherwise remain undetected and the athlete subjected to harmful strain by excessive training.

Secondly, the speed at which an athlete should walk in training can be assessed to some degree. Any interval training which causes the pulse recovery to take more than a few minutes to return to a reasonable "plateau" is probably too fast. For a beginner development comes in a few weeks and there is no sense hurrying it.

Thirdly, we can control the quantity of repetitions an athlete does. In the second stage (and thereafter) we know the normal recovery, and have stated that it should be identical after the 15th repetition as after the first. Now it could be that this is true after the 10th repetition, less true after the 11th, and quite untrue after the 15th. In that case we believe that 10 is quite enough for the time being. This is a very important control as it has become obvious for some time that it is desirable to do a very large mileage, yet that it is necessary to know when to stop.

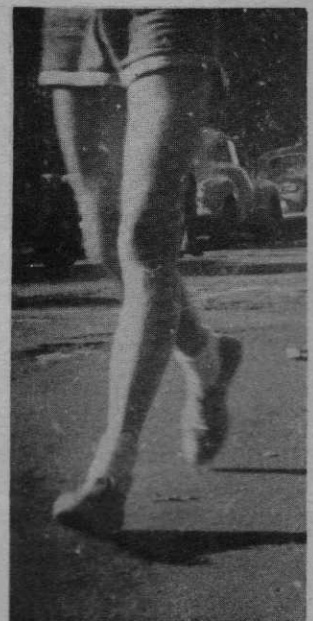
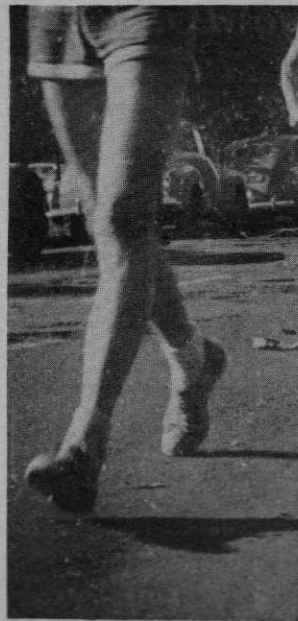
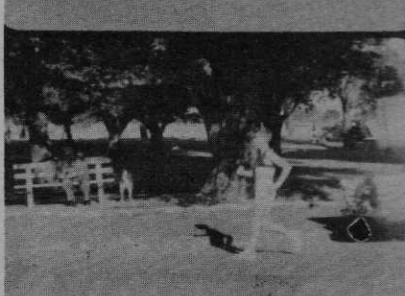
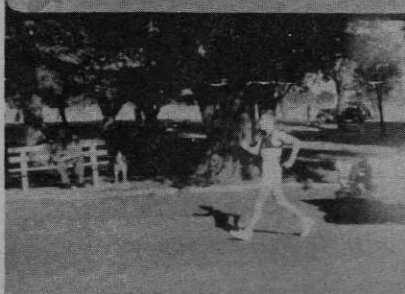
Fourthly, the rest period between repetitions can be reduced to that time necessary for the pulse to recover to the "plateau". This has the effect of intensifying the training without any harmful result to the athlete.

However, it should be noted that reducing the rest period will lengthen the pulse recovery time slightly and this factor should be watched carefully.

The regularity of the 10 seconds pulse checks for an athlete while training may be reduced as he finds his "plateau" for a particular training schedule. With experience, spot checks will suffice to bring the best from an athlete without harm to his health.

(Reference: "Pulse Recovery After Exercise" by Derek Cole. Modern Athletics, April, 1958)

This could be described as a joint wearing out. It had been thought likely that serious race walking increased the likelihood of contracting this condition, especially in the knee and hip joints. However, on close study, it was seen that many of the walkers suffering from the condition had also played other sports as well. Apparently certain people are more susceptible to arthritis than others. No matter what sport these people play (walking included) they are likely to contract osteoarthritis, which will probably be more severe if the sport is strenuous. We can assume osteoarthritis to be an occupational hazard to all sportsmen.



Action sequence, left, shows junior walker demonstrating correct form.

Top right, Josef Dolezal of Czechoslovakia leads Bruno Junk (22) and Leonid Spirin, the winner, in the 20,000m walk, 1956 Olympic Games.

Center, Figures 1 and 2 show consecutive pictures taken with interval of less than one hundredth of a second. In this period contact may or may not have been achieved.

Bottom right, Tommy Kristensen, Denmark.



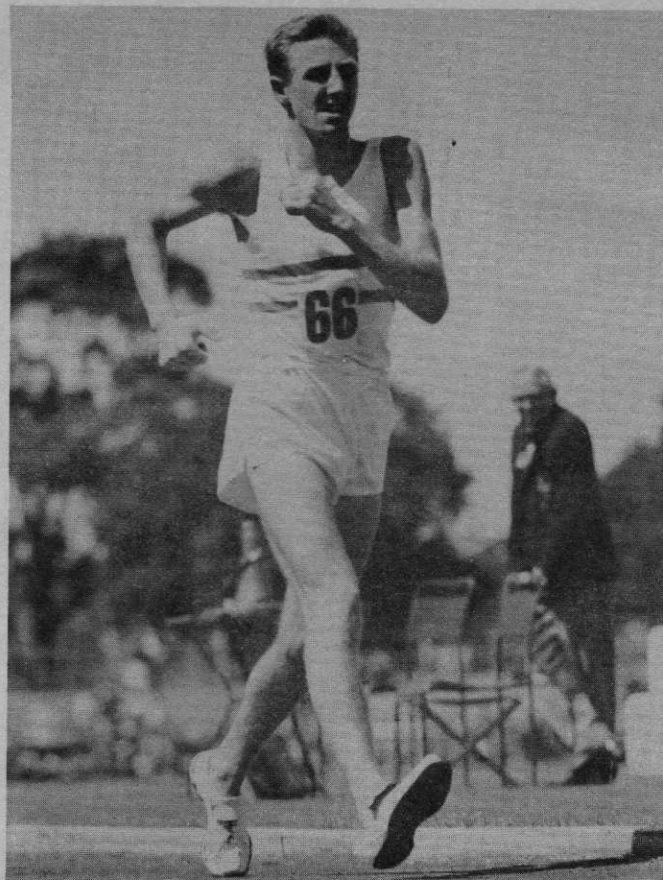
TOP ROW (left to right)

NOEL FREEMAN, Australia
Second, 1960 Olympics

RON ZINN, United States
Leading 1962 AAU indoor

TED ALLSOPP, Australia
World two hour record, 1956

DON KEANE, Australia
6th, 20,000m, 1956 O.G.



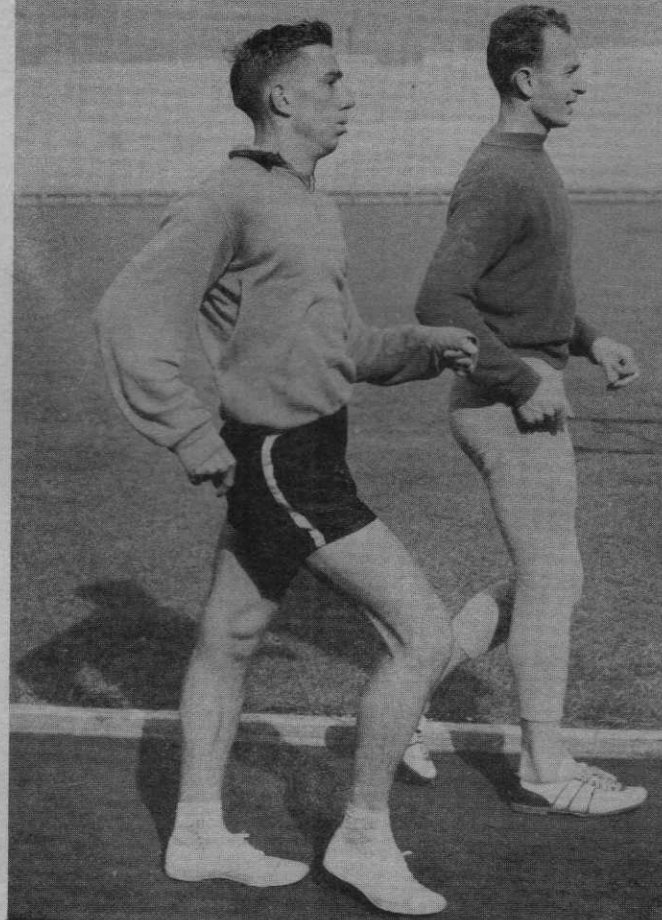
BOTTOM ROW (Left to right)

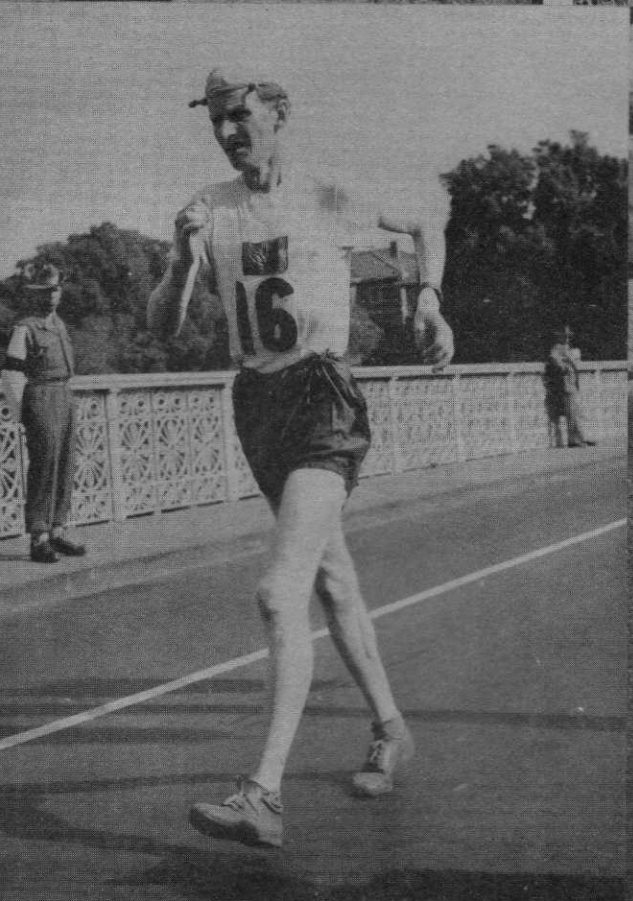
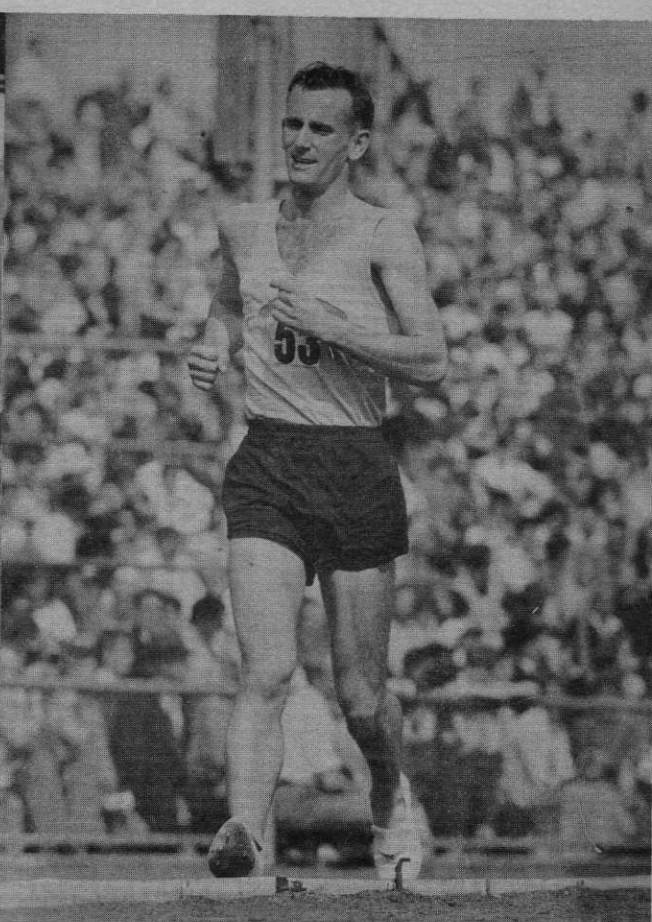
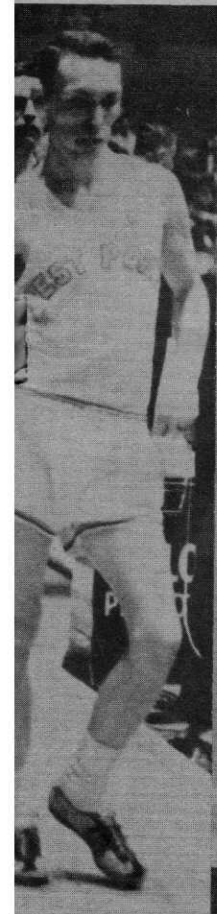
RON CRAWFORD, Australia (left)
Training at Olympic Village with
ABDON PAMICH, Italy
3rd, 50,000m, 1960 O.G.

BERT GARDINER, Australia
National champ of the 30s

JOHN LJUNGGREN, Sweden
1st 1948, 2nd 1960 O.G. 50km

DON THOMPSON, England
1st, 50,000m, 1960 O.G.





Training Schedules

EDWARD JAMES ALLSOPP

Ted Allsopp. Williamstown A.A.C. and Victorian Amateur Walkers Club. Australian Olympic Team 1956. Ex Australian Champion 2 miles to 50 kilometers.

Best times: 1 mile, 6:28; 2 miles 13:32; 5 miles, 32:25; 10,000 meters, 44:24; 20,000 meters, 93:30; 2 hours, 16 miles 403 $1\frac{3}{4}$ yards (world record 1956) Born December 15, 1926 at Edenhope, Victoria, Australia. Height 5 ft. 9 $\frac{3}{4}$ in. Weight 145 lbs. Started race walking in 1945 at age 18 years.

TRAINING FOR 3,000 METERS. Typical schedule:

Sun. 4x1 mile, 8 mins. pace. (2 mins. rest)
Mon. 12x440 at 1:50. (1 min. rest.)
Tue. 6x880 at 3:40 (2 mins. rest.)
Wed. 4x1 mile at 8 mins. mile pace. (2 mins. recovery)
Thu. 12x440 at 1:50 pace (1 min. recovery)
Fri. Rest.
Sat. Race.

TRAINING FOR 10,000 METERS. Typical schedule:

Trains 5 nights per week over repetition 440s, 880s, and $\frac{3}{4}$ mile. Races each Saturday.
Sun. 1 hour on road.
Mon. 16x440 with 1 min. recovery.
Tue. 7 miles at 8 min. mile pace.
Wed. 5x1 mile at 8 min. mile pace. (1 min. rest)
Thu. 12x440 at 1:50 to 2:00. (1 min. rest)
Fri. Rest.
Sat. Race.

TRAINING FOR 50 KILOMETERS. Typical schedule:

Sun. 5 hours road. (9-9:30 mins. per mile)
Mon. 10 miles on road, 8:45 mile pace.
Tue. 12 miles on road, 8:30 mile pace.
Wed. 10 miles track 9 mins. mile pace.
Thu. 12 miles, 8:30 mile pace.
Fri. Rest.
Sat. Race.

Trains alone and has no personal coach now, but was helped early in career by ex-New Zealand champion, Ian Driscoll, and later by club coach Cliff Barling. Lost form for a year or so while undergoing a style change recommended by the writer. Is now back in top form specializing in long distance with great success. Does no calisthenics or weight training. During 50 kilometers event, takes tea and glodocin.

JOHN GAVIN BREEN

Gavin Breen. Melbourne University A.A.C. and Victorian Amateur Walkers Club.

Best times: 1 mile, 7:06.4; 2 miles, 14:54; 5 miles, 38:16; 10 miles, 79:01; 20 miles, 2:47:50; 50 kilometers, 4:54:41.2. Born January 22, 1935 at Essendon, Victoria, Australia. Height 6 ft. Weight 147 lbs. Commenced race walking Nov. 1957 at age of 22 years.

PRE-TRAINING WARM UP: Runs 1 to 2 miles, walks slow half mile to 1 mile.

PRE-RACE WARM UP: Summer (short distances) 1 to 2 miles, including a few sprints. Winter, (long distances), runs 1 to 2 miles, walks 2 miles. If event is over 20 kilometers, 2 miles jogging and easy walking.

TRAINING FOR 3000 METERS. Typical week, mid-summer:

Sun. 10 miles run (6 $\frac{1}{2}$ to 7 min. miles) or walk (9-10 min. miles)
Mon. 6x440 at 1:40 to 1:45, slow style training recovery. $\frac{3}{4}$ hour weight
Tue. Repetition work over 2, 3, or 4 miles at 7:30-7:40 mile pace.

Wed. Repetition $\frac{1}{2}$ miles at 3:30, with slow recovery.
Thu. Repeat Wednesday.
Fri. Rest.
Sat. Race 5 to 7 miles.

TRAINING FOR 50 KILOMETERS. Typical week for winter:

Sun. After long race, over 20 kilometers. 15-25 miles stroll at 10-12 min. per mile.
Mon. 15-25x440's average 1:50 with slow 100 yards recovery.
Tue. 5-10 miles at 8 min. per mile if possible.
Wed. 4-6x1 mile repetitions. 7:30 to 8 min. for fast miles.
Thu. 8-10x $\frac{1}{2}$ miles, average 3:40-50 for fast laps, or 3x2 miles average 16 minutes.
Fri. Rest.
Sat. Race.

Trains half the time alone, is coached by Des O'Dwyer. Runs in competition on occasions and likes to compete in marathon runs once a year. Trains with weights and occasionally calisthenics. Pre-race meal: Porridge with added wheat germ and all bran. Steak, liver fried eggs or similar.

RONALD JOHN CRAWFORD

Ron Crawford. New South Wales Amateur Walkers Club. Australian Olympic Team 1956, 1960.

Best times 10,000 meters, 46:30; 20 kilometers, 94:30; 50 kilometers, 4:38. Australian 10,000 meters champion, 1961. Born March 26, 1936 at Randwick N.S.W. Australia. Height 5 ft., 11in. Weight, 175 lbs. Commenced race walking 1953 at age of 17 years.

PRE-RACE WARM-UP: Calisthenics and light walking, depending on weather conditions, jogs in cold weather. Usually trains the year round but occasionally has a rest period between seasons.

TRAINING FOR 3,000 METERS. Up to 5 miles of track work, varying from all slow work to a complete session of repetition 440s.

TRAINING FOR 50 KILOMETERS. Keeps up track work, and as much slow road work as time permits.

Has no personal coach and trains mostly alone. Does weight training and calisthenics. Takes extra vitamins. Pre-race meal: Grilled lamb.

JOSEF DOLEZAL

Josef Dolezal. Czechoslovakia Gold Medal European Games 10,000 meters 1954. Silver medal Olympic Games 50 kilometers 1952. Held 9 world records.

Best times: 3,000 meters, 12:00.1; 5,000 meters, 21:00.0; 10,000 meters, 42:29; 50 kilometers, 4:16.5. Born 1920 at Pribram, Czechoslovakia. Height 5ft., 8 $\frac{1}{2}$ in. Weight 148 lbs. Started race walking at age of 13 years.

PRE-TRAINING WARM-UP: Gymnastics, running and walking.

PRE-RACE WARM-UP: As above.

PRE-SEASON TRAINING: Some slow tempo walking but mostly gymnastics, swimming, skiing, and skating.

TRAINING FOR 3,000 METERS. Interval training ranging from 100 meters to 400 meters at speed.

TRAINING FOR 10,000 METERS. Trains twice daily-22 to 25 kilometers at various pace.

TRAINING FOR 50 KILOMETERS. As above with a once a

week outing of 65 kilometers at slow pace.

Trains alone and has no coach. Plays tennis, football and ice hockey. Does weight training in winter. Has a slow pulse rate of 36 (normal 48). Takes no extra vitamins, has regular blood count taken. Pre-race meal: Chicken and rice 4 hours before event. During 50 kilometers takes refreshments after 25 kilometers.

NOEL FREDERICK FREEMAN

Noel Freeman. Footscray A.A.C. and Victorian Amateur Walkers Club. Silver medalist 20 Kilometers Olympic Games Rome.

Best times: 10,000 meters - 43:41; 20 kilometers - 90:20; 50 kilometers track - 4:28; road - 4:30. Born: December 24, 1938 at Melbourne, started race walking 1955 at age 16 years. Height: 5ft., 10ins. Weight: 149 lbs.

PRE-RACE WARM UP: Runs until perspiration flows freely and body is up to racing temperature, then solid training, followed by a few exercises to loosen up and aid relaxation, followed by a few minutes rest before event.

PRE-TRAINING WARM-UP: As above but without exercises.

TRAINING FOR 3,000 METERS OR TWO MILES. One night $\frac{3}{4}$ pace up to 5 miles. Two nights interval training - $\frac{1}{2}$ and $\frac{3}{4}$ miles, gradually cutting rest periods as condition improves. One night of general training incorporating distance and sprints. Friday - rest. Saturday - Race. Sunday - Long distance.

TRAINING FOR 10,000 METERS. Similar to above with distances increased to 10 miles and on occasions 15 miles, plus few miles each week of medium paced running.

TRAINING FOR 50 KILOMETERS: Mainly distance training, 10 - 15 miles during the week. Saturday race. Sunday - long stripped spin approximately 4 to 5 hours at about 9 - 9:30 mile pace.

Trains alone and is coached by Percy Cerutti - believes in developing upper body strength by weight or body resistance exercises - says upper body strength develops power walking. He is a firm believer in massage. Recommends a variety of training venues and does not use a stop watch. Likes to split sessions into morning and evening workouts, separating strolling and running. Enjoys bush hikes. He says "Challenging every mountain is a great morale builder and stimulant to the mind". Takes vitamin tablets. Plays no other sport. Pre-race meal: Raw oatmeal and fruit. During 50 kilometers - salted water and glucose.

NOTE: Body resistance exercises mentioned are isometric contractions (maximum resistance of the body against an immovable force). Exercises carried out for 6 seconds for each movement.

CHARLES HERBERT GARDINER

Bert Gardiner. Brunswick A.A.C. - V.A.W.C. Aust. (retired from competition) Ex Australian Champion. Manager Empire Games Team 1958.

Best times: 1 mile 6:39, 10 miles 1:20:24, 12 miles 1:39:27. Born: London, England December 26, 1901. Height: 5ft., 5 ins. Weight: 132 lbs. Started race walking 1919. Former Australian 7 miles Champion, Former Victorian Champion 1 mile, 10 miles & 25 miles.

PRE-TRAINING WARM UP: Calisthenics, leg stretching by slow long stride, slow walking, high kicking.

PRE-RACE WARM UP: As above but fewer floor exercises. Trained all year round for 20 years, easing October to December.

TRAINING FOR ANY DISTANCE: Fit after long distance winter events. Eased to 3 nights weekly until December. Two weeks hard training during summer vacation on sandy

beaches in heavy shoes. Early January trained 11 times weekly midday and evening. Race Saturday. Interval training 440 and 220 yds, dashes never more than 8x440 yds., fast, with 440 yds recovery laps. Time trials over 440 yds and 880 yds. prior to major events in late summer. Longer work slow during autumn. Then longer interval training evenings and fast work at mid-day.

Note: (Although Bert Gardiner won his last championship nearly 30 years ago, his training schedule reads like a page from Franz Stamfl, Forbes Carlisle or even Percy Cerutti. No wonder he was a successful walker.) Trained alone and timed all laps, fast or slow, to improve pace judgment. Had no coach but listened to advice from all sources. Did weight training during winter months. Had pulse ratings taken occasionally (remarkably slow pulse.)

Pre-Race meal: Egg and milk at breakfast 10:30 a.m. No lunch. During 50 kilometers: Oranges, beef tea, Hot tea. Believed that walking should look like walking, and always did normal street walking at start of training, gradually lifting arms and walking in straight line after few laps. Recreations: Running, for mental change after major events were over in Summer months.

ROBERT CHARLES GARDINER

Rob Gardiner. Collingwood Harriers Club & V.A.W.C., Australia. Australian 2 miles Champion 1961.

Best times: 1 mile 6:41.6, 10,000 meters 48:16.20, 20 kilometers 98:03.6. Born: Preston, Victoria. March 22, 1936. Height: 5ft., 7ins. Weight: 130 lbs. Started race walking 1953 at age 17. (Son of ex Australian Champion Bert Gardiner.)

PRE-TRAINING WARM UP: Jog $\frac{1}{2}$ mile, stroll or slow race walk $\frac{1}{2}$ to 1 mile.

PRE-RACE WARM UP: As above, distance up to 3 miles depending on event to follow.

PRE-SEASON TRAINING: Between road and track season, weight training and style training.

TRAINING FOR 3,000 METERS. After basic style & build up program.

Mon. 10x440 sprints with 220 recovery.
Tue. Medium pace 4 miles.
Wed. 2x1 mile - little less than race pace.
Thu. Fartlek style on road 5 miles.
Fri. Rest.
Sat. Race.
Sun. Rest.

TRAINING FOR 10,000 METERS. Typical schedule.

Mon. 8 miles medium pace style training.
Tue. Rest.
Wed. 15x440 sprints.
Thu. 7 miles solid work out.
Fri. Rest.
Sat. Race.
Sun. Rest.

Believes that style training done during the season is more beneficial than trying to win each week. Trains alone only when necessary, has no personal coach. Trains with weights, does calisthenics but not before walking. Takes extra vitamins when necessary. Pre-Race meal: Scrambled eggs on toast, cup of tea.

JAMES JOSEPH GLEESON

Jim Gleeson. Chelsea AAC & V.A.W.C. Australia.

Best times: 1 mile 7:12, 2 miles 15:11, 5 miles 38:32, 10 miles 80:32, 20 Kilo, 100:35, 20 miles 2:47. 50 miles 8:42, 40 Kilo 3:31, 50 Kilo 4:44. Born: June 14, 1931 Melbourne, Australia. Height: 6ft., 1 $\frac{1}{2}$ ins. Weight: 161 lbs. Started

race walking 1958 at age of 27.

PRE-TRAINING WARM UP: Runs 880 yards then style walking at medium pace for $1\frac{1}{2}$ miles.

PRE-RACE WARM UP: Varies greatly depending on distance of race, i.e. 20 kilo events .runs 440 yds. then walks for about a mile, does lots of style training.

TRAINING FOR 3,000 METERS, OR 2 MILES. Being essentially a long distance man, training for the shorter events is carried out mainly to gain points for Chelsea in Inter-club competition. Training consists of repetition 440s or 880s with a two hour stroll once a week to break monotony of track walking.

TRAINING FOR 10,000 METERS. Typical workout.

Sun. 2 hours fast and slow strolling.
Mon. 1 hour " " " "
Tue. Repeat Sunday.
Wed. Repeat Sunday.
Thu. Repeat Monday.
Fri. Rest.
Sat. Race.

TRAINING FOR 50 KILOMETERS. Similar to 10,000 meters with a longer duration of the hours of training during the week.

Sun. 4 to 5 hours stroll.
Mon. Rest or 1 to 2 hours stroll.
Tue. 1 to 3 hours stroll or repetition 440s on track.
Wed. Repeat Tuesday.
Thu. Repeat Tuesday.
Fri. Rest or light stroll. Running is mixed with track work.
Sat. Race.

The distances are built up gradually from Autumn, from 1 hour work outs, until Spring where maximum efforts are produced. Work is done on road, track or beach or combined - Fartlek style. Training cuts out on the Monday before major distance events to allow full recovery.

Medical checkups are made and weight watched closely. Pulse ratings are taken regularly. Does weight training early in season and regular calisthenics. Coached by Frank McGuire. Pre-race meal: Grilled steak and salad. During 50 Kilo: Honey, glucose, glucona, salt tabs with small glass of water.

VALDEMAR-WILLIAM GRANDY

Bill Grandy. Toronto. Ontario. Canada.

Best times: 3,000 meters 12:02.6; 5000 meters 20:36.8; 10,000 meters 44:25.0, 1 mile 6:37; 50 Kilo. 4:49:54.9. Born: Ventspils Latvia. Height: 6ft. Weight: 165 lbs. Started race walking in 1937 aged 17. Has raced in Sweden, Latvia, Aust., Canada and U.S.A.

PRE-TRAINING WARM UP: Gymnastics, combined with a fair amount of speed work (if weather is not too hot).

PRE-RACE WARM UP: Gymnastics and several laps of slow walking injected with a few short but sharp bursts.

PRE-SEASON TRAINING: Gymnastics, body build up with two or three long distance hikes wearing heavy boots.

TRAINING FOR 3,000 METERS. Gymnastics followed by 4-6 laps slow relaxed walking, rest 2 to 5 mins., then several fast dashes at 95% effort over about 120 yards on each side of track, spaced by completely relaxed slow walking or jogging around curves, occasionally mixed with a 95% effort for 440 yards. Followed this schedule in 1943-44 four to five times weekly for an hour each day. On other days worked out over 3 to 6 miles walking or running.

TRAINING FOR 10,000 METERS. Gymnastics followed by 4-6 slow relaxed walking, then 90 mins. of interval training, fast 440s of 90% effort with 100 to 200 yards recovery, 4 nights per week, other nights long strolls.

TRAINING FOR 50 KILOMETERS. Has never trained for this event in particular but would recommend a mixture of speed

and strolling 50x50. About 80 to 120 miles per week.

Trains mostly alone, has seldom had a coach and occasionally plays other sports. Does some weight training, has pulse rate taken and does calisthenics. Now takes extra vitamins. Pre-race meal: Likes to eat light meal such as oats or rice at least three hours before race, longer if event is over long distance.

ERIC WILLIAM HALL

Eric Hall. Belgrave Harriers - England, Olympic representative 1956-60.

Best times: 2 miles 13:51; 10 miles 73:38; 7 miles 50:40; 15 miles 1:57:15; 20 miles 2:39:07; 50 Kilo 4:31:41. Born: September 15, 1932 - Oxshott, Surrey, England. Height: 6ft. Weight: 140 lbs. Commenced race walking 1948 aged 16 yrs.

PRE-TRAINING WARM UP: 1 to 2 miles depending upon distance and temperature, plus some stretching exercises.

PRE-RACE WARM UP: As above.

TRAINING FOR 3,000 METERS. 12x330 yds, with 110 yds recovery then 660 yds fast and 220 yds recovery (6 times) all four times per week. Other night stamina training, especially for short events.

TRAINING FOR 10,000 METERS.

Sun. 12 miles stroll (2 hrs.).
Mon. 7 miles stroll.
Tue. 7 to 10 miles fast.
Wed. 2 hrs. stroll.
Thu. Repeat Tuesday.
Fri. Rest if racing Saturday.

TRAINING FOR 50 KILOMETERS. As above but stepping up the distance to double if time allows, for approximately 1 month before major event.

Prefers to train in company - has no coach. Pre-race meal: Says "strangely enough" - "bread and jam". During 50 Kilo: Lemonade or tea depending on weather. Believes in style training when warming up but says he is by no means a stylist.

ALAN JAMES HANCOCK

Alan Hancock. Glenhuntly A.A.C. and V.A.W.C. Australia. Holder of 4 Aust Junior records (under 19 yrs.)

Best times: 1 mile 7:02.6; 5 miles 38:30; 10 miles 79:36; 20 Kilo. 99:17; 20 miles 2:50:18; 50 Kilo 5:04. Born: Leeton N.S.W. September 11, 1940. Started race walking 1956 aged 16 years.

PRE-TRAINING WARM UP: Calisthenics, style walking (not fast) for 10 to 15 mins only.

PRE-RACE WARM UP: As above.

TRAINING FOR 10,000 METERS. Two or three 5 to 10 mile spins per week at 80-90% effort but with best style possible. Concentration on style essential. Three other sessions per week slow walking with many bursts of speed for 30-70 yds. Plenty of stretching exercises.

TRAINING FOR 50 KILOMETERS. At least two long street walks per week, 10-20 miles with at least one stroll over the full distance a few weeks before event. Consistent daily spins at solid pace (average about 8:15 min, miles) over varying distances.

Trains 50% alone and 50% accompanied. Has no coach at present but listens to good advice. Uses light weights occasionally, does lots of calisthenics. Has pulse taken (average 45-48). Takes extra vitamins when training for 50 Kilo. Believes in

style training, particularly for young walkers. Pre-Race meal: Porridge (oats) toast and honey, sultanas etc., During 50 Kilo: Drinks anything except alcohol or soft drinks. Prefers to eat honey, oranges and lemons.

GEORGE GRAHAM HAZEL

George Hazle. Tansvaal, South Africa. Olympic Representative 1960, South African Champion.

Best times: 1 mile 7:13; 3 miles 23:36; 20 Kilo 1:33, 50 Kilo 4:43. Born: October 3, 1924. Height: 5ft., $\frac{1}{2}$ in. Weight: 152 lbs. Started race walking 1957 at age 33, Athletics 1939.

PRE-TRAINING WARM UP: Calisthenics then 2 laps slowly.

PRE-RACE WARM UP: As above but distance increased to $\frac{3}{4}$ to 1 mile slow medium pace on road or track.

PRE-SEASON TRAINING: Cross country walks and weight training.

TRAINING: The standard distances of events in South Africa is 1, 2 and 3 miles on the track and 20 Kilo and 50 Kilo on the road. Only two national championships are held, the distances 3 miles and 50 kilo. A 20 kilo trial for the Olympic Games was held for the first time in 1960.

"In this country we cannot specialise, therefore, in my own case training is a combination of road and track walks". The road walks to build up stamina vary between 5 to 28 miles depending on the event. Sundays are the days for 3-5 hour walks. At the height of the season I do 3 track training sessions and 1 road walk between 5 and 10 miles during the week, I am just starting repetition track work."

Trains alone, plays no other sport. All training is done at altitude of 6,000'. Sample reps: 10 to 24 reps. 440 yds with 220 recovery times between 1:45 to 2 mins. 1 mile reps x 440 recovery. Does some calisthenics as well as weights, takes own pulse check, takes vitamins when training hard. Pre-Race meal: Porridge if a morning race, sandwiches if event is in afternoon. During 50 Kilo. Weak black tea with sugar and glucose.

DONALD MICHAEL KEANE

Don Keane. Glenhantly A.A.C. and V.A.W.C. Australian Olympic representative 1952, 1956.

Best times: As junior (under 19 yrs.) 1500 meters 6:11; 1 mile 6:46.8; 2 miles 14:17. As Senior, 1500 meters 6:03; 1 mile 6:19.2; 3000 meters 12:22.2; 2 miles 13:28.6; 3 miles 20:24; 5 miles 35:03; 10 kilo 43:37; 7 miles 42:14; 1 hr. - 8 miles. 875 yds; 10 miles 71:07; 20 kilo 90:22.2 (track), 93:50 (road), 8 miles (road) 57:04. Born: Perth. Western Australia. November 12, 1930. Height: 5ft. 8ins. Weight: 147 lbs. Commenced race walking in 1947 aged 16 $\frac{1}{2}$. Holds 9 Australian records, 1 Australian Junior record and 2 miles record in each state of Australia.

PRE-TRAINING WARM UP: Jogging, lots of loosening up exercises, more jogging, more exercises, finishing up with style training before start. If temperature over 90 degrees, never wears sweat clothes and without singlet if possible.

PRE-RACE WARM UP: As above but always on own.

PRE-SEASON TRAINING: Strength work must be enjoyed. Cerutti type work - beach and cross country running (anything but walking). In lighter moments strenuous game of tennis, kicking a football, plenty of dancing (rock & roll etc.)

TRAINING FOR 3000 METERS. (also 1 or 2 miles.) Mainly in summer months in varying degrees of heat. In Perth for instance 80 to 100 degrees. Sample 1 evening: Warm up 1 $\frac{1}{4}$ miles, 100 yds. recovery, $\frac{3}{4}$ miles 100 yds. recovery, $\frac{1}{2}$ mile 100 yds. recovery. $\frac{1}{2}$ mile, $\frac{1}{4}$ mile recovery, another slow $\frac{1}{4}$ mile. 3x220 yds. First 5 laps done at 7 mins. mile pace and

speed up as distance shortens all non stop. Second evening: Warm up, then fast $\frac{3}{4}$ mile, repeat $\frac{1}{2}$ mile, repeat $\frac{1}{2}$ mile and then 4 miles with 100 yds. recovery between efforts. Fast work all at 6:50 mile pace, or better, finish with few sprints. All non stop. Beach work on Sunday when racing on Saturday.

TRAINING FOR 10,000 METERS. Generally in winter time, treats entirely different to track preparation. Having walked a few solid 10 miles on road, trains on track for the last month, also 2 nights per week in gymnasium. On Sundays if weather conditions good, spend all day in hills. Actual training on track similar to 3000 meters preparation, only longer distances at slightly slower pace. Sample: 3 $\frac{1}{2}$ miles fast, 2 $\frac{1}{2}$ miles fast, 1 $\frac{1}{2}$ miles fast with $\frac{1}{4}$ mile recovery between efforts. Light calisthenics, then fast $\frac{1}{4}$ mile. Start with 7:20 mile pace and speed up each effort. All non stop or after warm up try for an even pace with varying distances i.e., 1 mile, 1 $\frac{1}{4}$ miles, 1 mile, 1 $\frac{1}{2}$ miles and 1 mile and 1 $\frac{1}{4}$ miles with 220 yds. recovery between efforts. Finish with sprints. In cold weather wear light pajamas, underwear etc., to cover arms and legs. Prefers to train alone and has no coach but always a good listener. Has gained knowledge from ex Olympian George Knott, Percy Cerutti, Glenhantly coach Gus Theobald, Frank McGuire and others. Is a great believer in calisthenics and exercises each day. Does weight training daily. Pre-Race meal: Chipped potatoes in oil, grated carrots, 1 egg, tomato, 2 slices wholemeal bread, honey, always 6 hrs. before event. Believes that walking should look like walking and trains that way. Has annual medical check up.

CECIL WILLIAM ROBERT KIRBY

Bill Kirby. New South Wales Amateur Walkers Club Australia.

Best times: 1 mile, 6:47; 2 miles, 14:43; 10,000 meters, 48:22; 20 kilometers, 101 minutes; 50 kilometers, 4:48:49. Born: 1935. Height: 5ft. 8in. Weight 144 lbs. Started race walking 1953 at age 18.

PRE-TRAINING WARM UP: Usually runs about 2 miles.

PRE-RACE WARM UP: A few minutes jogging to loosen up, followed by slow walking from 1 to 4 miles depending upon distance of event. Calisthenics until desired suppleness is obtained.

TRAINING FOR 3,000 METERS. Being married, cannot afford time for more than 3 training sessions per week.

Sun. 6 miles style on golf course in one hour (no warm up).
Tue. 8x880 yards, average 3:40 with 1 minute recovery.
Thu. 2 miles run then 8x440 yards in 1:45 with 1 minute recovery, followed by 12x100 yards, concentrating on stride length.

TRAINING FOR 10,000 METERS: Similar to above but with an increase of about 50% each session.

TRAINING FOR 50 KILOMETERS:

Sat. Race (races average about 15 miles).
Sun. Slow strolling on open road 15-20 miles.
Tue. Style walking on golf course, 6 miles at 6 miles per hour.
Thu. Alternate laps running and walking on golf course up to 10 miles.

Trains alone and has no coach. Does calisthenics before racing. Belives in concentrating on style rather than speed, says: "If style is perfected speed will come with work." During 50 Kilo-meters: Eats oranges, glucose jelly beans, chocolate in cold weather. Drinks mostly glucona.

TOMMY KRISTENSEN

Tommy Kristensen. Club: Sdr. Omme I.F. Denmark. Olympic Representative 1960.

Best times: 10 kilos, 43:47.2; 15 kilos, 1:08.6 (track) 1:08:-51.4; 20 kilos, 1:33:34.6; (Scandinavian Junior champion in 1959. Danish junior record holder for all distances from 3 to 15 kilometers.) Born: November 6, 1939 in Denmark. Height: 5ft.

11½ in. Weight: 149 lbs. Started race walking 1953 at age 14.

PRE-TRAINING WARM UP: Running and rhythmic exercises.

PRE-RACE WARM UP: Running and rhythmic exercises and at least ½ hour walking.

TRAINING FOR 20 KILOMETERS: Off Season: (Dec. to Feb.) Trains four times a week. Walks 25 to 30 kilos twice weekly to strengthen the legs. Other two nights fartlek training: 1 kilo run-1 kilo walk-3 kilo run-2 kilo walk-2 kilo run-3 kilo walk -1 kilo run and so on for about 1½ hours, walking speed 6 minutes per kilo, running speed 4 minutes per kilometer. From March trains 5 or 6 times a week. Style training at moderate speed for first two weeks. Then commences interval training on 400 meters (1:40 to 1:45 per 400 meters) for about 1½ hours. Includes 1 day a week 20 to 25 kilos long walk.

Does no weight training, takes some vitamins in tablet form, plays no other sport.

RONALD OWEN LAIRD

Ron Laird. Norristown Penna. U.S.A. Olympic Representative 1960.

Best times: 1 mile 6:47.6; 10 miles 1:19.44; 12 miles 1:35.35; 20 kilo 1:40.9; 15 miles 1:57.54; 35 kilo 3:5.09; 40 kilo 3:45.46; 50 kilo 4:40.9. Born: Louisville, Ky., U.S.A., May 31, 1938. Height: 6ft. ½ in. Weight: 166 lbs. Commenced race walking September, 1955, aged 17 yrs. Has won national championships.

PRE-TRAINING WARM UP: Never warms up before training, likes to start cold.

PRE-RACE WARM UP: The shorter the race the longer the warm up. A lot from 1 min. to 15 mins., a lot of short sprints, stretching and balancing exercises. Beyond 15 miles, stretching and balancing exercises. Trains the year round. Likes to do fast hiking of 25 to 35 miles on Sundays when not racing. Rest of time all interval work.

TRAINING FOR 3000 METERS. Track or road consists of fast sprints from 100 yds. to 800 yds., a few fast miles. The interval work ranging from 5 to 7 miles, mostly road work - likes to walk up and down long steep hills. Always wears sweat suit no matter how hot. Uses ankle weights a lot.

TRAINING FOR 10,000 METERS: As above but including 3 to 7 miles time trials, mostly on roads as tracks are not kept up to condition.

TRAINING FOR 50 KILOMETERS: As above. On week-ends fast hiking of 25 to 30 miles. Likes to do "power walking" as Cerutti advocates for runners. (Holds his breath a lot in training.)

Believes in training alone to intensify interval work. Has no coach and says none available for race walking mainly because there are no walking events on collegiate programs. Does calisthenics after training - stretching and strength straight after road work. Uses weights to strengthen upper body.

Recreation: Throws discus and javelin, swims breast stroke and butterfly, some speed skating. Takes extra vitamins - ABCE - mineral tablets and protein pills. Pre-Race meal: High starch before race over 5 miles. During 50 kilo event says it is hard to obtain aid during events (about 2 a year), so takes anything offered. Water and fruit juices preferred, also ice cubes.

ARMANDO LIBOTTE

Armando Libotte. Viganella - Switzerland. (retired) Swiss 75 Kilo Champion 1951. Now member of I.A.A.F. Walking Commission. Chief Judge, Melbourne. Australia. Olympic Games 1956.

Best times: 75 Kilo. 7:25.00; 100 Kilo. 10:42.00. Born: Bad

Worishofen. December 6, 1917. Height: 5ft. 9½ in. Weight: 160 lbs.

PRE-RACE WARM UP: Gymnastics, slow walking, then faster.

PRE-SEASON TRAINING: Cross country walking.

TRAINING FOR 3,000 & 10,000 METERS. Interval training i.e. 1 Kilo 4:30; interval 6 minutes, 3 to 4 work outs per session 4 times per week.

TRAINING FOR 50 KILOMETERS. Two to three days weekly as above and twice weekly over longer distances from 25 to 35 kilo. Trains alone and has no coach. Plays football and basketball. Trains with weights and has blood count taken.

Pre-Race meal: Normal. During 50 Kilo: Takes orange juice, dates and figs.

JOHN LJUNGGREN

John Ljunggren. Sweden. Olympic Gold Medalist London 1948. 50 Kilometers. Olympic Bronze Medalist Melbourne 1956. Olympic Silver Medalist Rome 1960. (at age 41)

Born: Forsheda. September 19, 1919. Height: 5ft. 10½ in. Weight: 133 lbs.

PRE-RACE WARM UP: Running and Gymnasium. Trains the same for all distances, running and gymnasium form a large part of his pre-season training; believes that to be a good walker, a man must be in good condition. This condition is gained by hard pre-season (winter) training. Racing in Sweden takes place in the summer months. Eats lightly before racing. During 50 kilometer race eats orange and drinks warm water with honey, grapesugar and lemon. Other sport - a little skiing and running.

Trains mostly alone but sometimes with his brother. Has no coach and does very little weight lifting.

"For a couple of nights a week my training consists completely of running, and quite often on other nights after some running, I walk 8 to 10 kilo. When I come to a hill, I try a little harder and sometimes make sharp bursts on the flat." Seldom trains on the track.

"At the start of my training, I also do some gymnastics. During the training, I also do some gymnastics. During the training period, I often give various degrees of effort and never stop moving before the whole of the training period is completed. I then shower and a couple of times a week take a bastu (Swedish dry heat bath with temperature of 240 degrees or higher.)"

Footnote: John Ljunggren must be an inspiration to his fellow walkers in Sweden. His three Olympic medals prove that, in addition to his remarkable stamina, he also possesses a fair style, particularly suitable for long distance.

KENNETH JOSEPH MATTHEWS

Ken Matthews. Eddington. England. Olympic Representative, 1960.

Best times: 2 miles 13:09.2; 5 miles 34:21.6, (both track); 7 miles 48:02 road; 10 miles 70:57; 7 miles 48:24 (track); 20 kilo 88:15 (road); 25 kilo 1:53.0. Track 1 hour, 8 miles 1018 yards. Born: Birmingham, England. June 21, 1934. Started racing 1952 at age 18.

PRE-TRAINING WARM UP: Approximately 20 minutes, jogging and walking then 3 or 4 straight sprints.

PRE-RACE WARM UP: 20 minutes walking to remove all stiffness, shin soreness etc. - three or four 200 yards sprints and 10 minutes rest. Trains all the year round during winter races 7 miles every fortnight, training is cut a minimum during November and December so that full training in February means

extension of distances with fitness retained.

TRAINING FOR TWO MILES: The fact that there are many races from 7 miles upwards restricts serious training for shorter distances. Therefore 2 miles training is incorporated with 7 miles training, i.e. fast and slow laps 1:35 and 2:35 x 15 or 20. Training varies according to how he feels. Sometimes a fast mile with 10 minutes break followed by 2 to 3 miles followed by a flat out mile. This is made easier if you can have a runner just in front to keep you going.

TRAINING FOR 10,000 METERS AND 7 MILES. Likes to cover the distance at least twice a week including the above training for pure speed while keeping an eye on style. Someone usually tells him if he is moving correctly. He does not race in the longer events such as the 50 kilo, believing that these distances have a slowing effect for sprinting. Trains alone and has no personal coach but is advised by his father and H. H. Whitlock. Has no other sporting activities. Does no weight training, and calisthenics only occasionally when warming up.

Pre-Race meal: One or two soft boiled eggs or poached on toast usually at breakfast time. Nothing else before the race unless the event is in the late afternoon when a ham salad less cucumber and tomatoes is taken. Believes a walker should develop his own particular style while training - always remembering the rule of walking.

ROBERT F. MIMM

Robert Mimm. Olympic Representative Rome 1960. Levittown, Pa., U.S.A.

Best times: 2 miles 14:53; 20 kilo 1:36; 50 kilo 5:15. Born: Lancaster, Pa., U.S.A. October 18, 1924. Height: 5ft. 11in. Weight: 150 lbs. Started race walking 1955 at age 31.

PRE-TRAINING WARM UP: Jogging, stretching exercises, moderately slow walking with short sprints.

PRE-RACE WARM UP: As above but with less slow walking and more sprints.

TRAINING FOR 3,000 METERS. "When concentrating on a distance of approximately 3,000 meters, I like to do repetition work at a very fast pace. Perhaps 440s fast and slow or a combination of 220s, 440s, and 880s. I do not follow any rigid training scheme".

TRAINING FOR 10,000 METERS. As above with longer distances and added road work from 7 to 10 miles. Some 3 x 2 miles sprints on track.

TRAINING FOR 50 KILOMETERS. Starts 50 kilo training early with 10 miles stroll on Sunday and increases distances each Sunday until distances are up to 34 miles. Fast work during the week, two work outs of from 7 to 20 miles. If time allows, one day on track for 10,000 meters.

Has no personal coach and plays no other sport, has done weight training to advantage but can't find time now. Takes multiple vitamin tablets. Pre-Race meal: Oatmeal, tea perhaps toast and juice. During 50 kilo: Drinks soda - perhaps with honey. Nothing to eat.

JOHN E. MORTLAND

John Mortland. Columbus, Ohio, U.S.A. Olympic Representative 1960.

Best times: 1 mile 6:42; 20 kilo 1:43:17; 25 kilo 2:13:03; 10 miles 1:19:14. Born: Galion, Ohio. January 23, 1935. Height: 5ft. 11in. Weight: 140 lbs. Started race walking August, 1958 at 23 years.

PRE-TRAINING WARM UP: For shorter distances alternates strolling with hard bursts of $\frac{1}{2}$ to $\frac{3}{4}$ mile. When training at a slower pace generally does not warm up at all. Says "Actually I have been able to do a mile well under 7 minutes in

practice without warm up and with no apparent harm, and I must add that this is completely opposite to my running experience where I have always warmed up quite thoroughly."

PRE-RACE WARM UP: Similar to above but tapering right off for longer events.

TRAINING FOR 3,000 METERS. Does 2 nights per week running (Monday & Thursday) consisting of repeat 220s and 440s, at a moderate pace with short recovery rest or jogging. Walk workouts follow similar lines, perhaps 8x440 at 1:35 minutes per lap with strolling recovery. Generally walks from one to three miles 4 times each week. Average about 5 workouts per week.

TRAINING FOR 10,000 METERS. This would be along the same lines as above but the number of reps would be greater at a slightly slower pace. Has trained for 25 kilo events but no further, and has still followed the repetition training method. Has done up to 36x440 at average of 1:51 with shorter recovery periods (50-60 seconds) at fast strolling pace (about 5 m.p.h.) Finds long strolling too boring.

Trains mostly alone, has no coach, likes running and playing baseball. Uses weights for light work out about twice per week.

Pre-Race meal: Two poached eggs, toast and tea, when event is in morning. If racing in afternoon likes steak 4 to 5 hours before.

FRANK O'REILLY

Frank O'Reilly. Lozells Harriers. Eire Olympic representative Rome 1960.

Best times: 2 miles, 15:30; 5 miles, 39:12; 6 miles, 47:52; 7 miles, 55:52; 10 miles, 81:09; 15 miles, 2:06; 20 miles, 2:55; 50 kilometers, 4:46:32; 100 miles, 16:54:15. Born: April 7, 1924 at Dublin, Eire. Height 5 ft. 10 in. Weight: 178 lbs. Commenced walking at 25 years of age.

PRE-TRAINING WARM-UP: 30 minutes steady walking.

PRE-RACE WARM UP: 40 minutes walking, generally steady, with occasional sprints. Shakes hands, legs, and body generally to ease tension.

TRAINING FOR UP TO 15 MILES: Mid-Week: Track work with fast and slow sessions of 440, 880 yards and 1 and 2 miles, and occasionally sustained sessions of 1 hour duration. Week-ends: Saturday, if not racing, training up to 2 hours at a reasonably fast pace. Sunday, strolls of not less than 2½ hours duration at approximately 6 miles per hour.

TRAINING FOR 50 KILOMETERS OR LONGER: Mid-Week: Fast 2 mile walks and 1 hour sessions. Week-end: Fast 10 or 15 miles walks on Saturday. Strolls of 4 to 5 hours duration at approximately 6 miles per hour on Sundays. "I place particular emphasis on style training for my 100 mile walks. The man whose strides flow in to a rhythm will move quite swiftly even when he is very fatigued. Some walkers tend to fight the force of gravity rather than proceeding with a sustained leverage of the body with the legs. Very often in walks of a long distance nature it isn't necessarily the fast walking alone that counts. It is the amount of slow walking you can avoid doing. Obviously great fitness will prevent this happening, but an economical action will prevent it even more. There isn't much point in being fit and strong if you haven't got the ability to express your effort freely and economically. Good walking is nice to watch, but bad walking looks positively grotesque."

Advocates weight training but gets enough in his work as a foundryman to give him the added strength needed for distance racing. Pre-Race meal: Short distances, egg on toast or brown bread with tea two hours before race. Long distances: Usually salad or of a salad nature up to one hour before race. During a long distance event: Usually cold rice pudding, hot tea with plenty of sugar and a little milk.

HENDRICK PIENAAR

Hendrik Pienaar. Johannesburg. South Africa. Olympic Representative 1960.

Best times: 1 mile 7:14; 3 miles, 23:2; 50 kilo, 4:52. Born: Oudtshoorn, Cape Province. February 13, 1916. Started race walking 1948 aged 32 years.

PRE-TRAINING WARM UP: Breathing exercises and 6 laps walking.

PRE-RACE WARM UP: Breathing exercises and slow walking, finish off with a few fast sprints about 3x50 yards.

PRE-SEASON TRAINING: Long slow walks once a week for 2 to 4 hours.

TRAINING FOR 3,000 METERS: 1 hour on track twice weekly or 8 to 10 laps of 440 yards at 1:50 per lap.

TRAINING FOR 10,000 METERS: Road walks: 2 hours walk on road at a fast pace and $\frac{1}{2}$ mile sprint on track at 3:40.

TRAINING FOR 50 KILOMETERS: Road walks: built up in from 2 hours walk to 5 hours walk on road, and twice a week on track doing 440 yards interval training at 1:40 laps 8 to 12 laps.

Trains alone and has no coach, believes in always keeping fit. Motto is "train to strain, never strain to train". Recreation: Fond of ballroom dancing.

GABRIEL REYMOND

Gabriel Reymond. Switzerland.

Best times: 3,000 meters, 13:10; 10,000 meters, 45:04 20,000 meters 93:51; 50 kilometers, 4:40. Born: 1923. Weight: 154 lbs. Height: 5ft. 5in. Started race walking 1942. Represented Switzerland in European Games 1954, 1958. Olympic Representative 1952, 1960.

PRE-RACE WARM UP: For 3,000 to 10,000 meters, 1 hour warm up including sharp bursts. For longer events $\frac{1}{2}$ hour similar to above.

WINTER TRAINING: (November to March.) Trains three times weekly. Tuesday and Thursday: Workouts in clubrooms including rhythmic exercises and ball games. Sunday: Walking and running in the country for 3 to 4 hours interspersed with short sprints and rhythmic exercises.

SUMMER TRAINING: (April to October.) Typical workout for 20 kilometers:

Mon. 1 hour rhythmic exercises and relaxed strolling on track or road.
Tue. 2 hours on track. First hour interval training 100 yards fast and slow. Second hour fast tempo.
Wed. 1 hour stroll.
Thu. $2\frac{1}{2}$ hours. First at slow pace interspersed with 3x1000 meters sprints, then fast tempo for last 1,000 meters.
Fri. As Wednesday.
Sat. Rest.
Sun. Race, or long walk in the country for 4 hours.

Information supplied by former Swiss walker Claude Martin who trained with Gabriel Reymond. Claude is now a resident of Australia and a member of the Victorian Amateur Walkers Club.

RAYMOND CHARLES SMITH

Ray Smith. Coburg Harriers Club and Victorian Amateur Walkers Club. Australian Olympic Team 1956.

Best times: 1 mile, 6:35; 10,000 meters, 47:06; 50 kilometers, 4:40. Born August 12, 1929. Height: 6ft. 2in. Weight: 189

lbs.

PRE-TRAINING WARM UP: Slow walking exaggerated style, followed by jogging and long striding running, plus light calisthenics.

PRE-RACE WARM UP: As above plus a few walk bursts at race pace according to how you feel on day.

TRAINING FOR 3,000 METERS AND 10,000 METERS. Hiking, climbing, strolling, and cross country running. Repetition speed work over various distances with short recovery period.

TRAINING FOR 50 KILOMETERS. Trained only for 2 years in preparation for this distance prior to the Melbourne Olympic Games winning Australian Championship in 4:40 and filled 6th place in Olympic Games. Training was based on a schedule originally prepared for Don Thompson by Harold Whitlock. Tough mountain walking with pack was substituted for long strolls when ever practicable and some 10,000 meters types training used instead of some stripped spins. Did not follow set schedule entirely but trained to his own feelings.

Coached by Coburg Harriers coach George Price as a junior and joined the Cerutti group in 1953 and has been advised by him since then. "Terrain at Portsea is not suitable for walking training except strolls. My time spent there is for general conditioning with running, (this aspect is neglected by most Australian walkers I believe) and talks. Often I found the atmosphere so relaxing and talks so interesting, that exhausting training was forgotten. This always resulted in a keener attitude towards training on return to the city."

Plays no other sport seriously, but enjoys basketball, squash, and table tennis as much as possible. Trains with weights, for trunk and upper body only. Uses heavy weights with few repetitions as regularly as possible without fixed schedule. Takes vitamins as a precautionary measure when training hard. Pre-Race meal: Poached eggs, toast and honey, coffee, and ice cream four to five hours before race. General diet as laid down by Percy Cerutti. Eats large meal on day before race and to satisfaction on race day for race over 10 miles.

DONALD JAMES THOMPSON

Don Thompson. Metropolitan Walking Club, Middlesex, England. Gold Medalist Olympic Games Rome 1960, 50 Kilo.

Best times: 1 mile 7:15; 2 miles 14:46; 5 miles 37:52; 7 miles 53:19; 7 miles (road) 52:25; 10 miles (road) 76:11; 20 miles 94:45; 20 miles (track) 2:41:43.8; 50 kilo (track) 4:17:29.8; London to Brighton 53 miles, 7:35:12. Born: Middlesex, Eng. January 20, 1933. Height: 5ft. 5 $\frac{1}{2}$ in. Weight: 120 lbs. Started race walking in 1951. Holds British records, track 20 miles to 5 hours inclusive.

PRE-TRAINING WARM UP: Only before track training.

PRE-RACE WARM UP: Gentle walking, sprints, stretching repeated from about 1 hour before race until about 5 minutes from start. Trains all the year. Races all distances on 50 kilo schedule.

TRAINING FOR 50 KILOMETERS:

Sun. 25 to 30 miles (in shirt and trousers) pace 6 m.p.h. or better.
Mon. 5 to 7 miles (stripped training)
Tue. Fast and slow laps - 1:50 and 2:40x440 yards x 12 to 15 laps.
Wed. 8 to 12 miles at 6 $\frac{1}{2}$ miles per hour or better.
Thu. (if no race Sat.) 6 to 8 miles on road or 5x1 miles with 880 yards recover laps.
Fri. Rest.
Sat. 10 to 14 miles or race 20 to 50 miles.

Trains alone on road, or in company with club mates on track. Has no personal coach but seeks advice from H.H. Whitlock. Takes part in no other sports but enjoys hill walking on holidays. No calisthenics except stretching exercises occasionally.

Pre-Race meal: Boiled egg, toast and marmalade, tea. During

50 kilo: Has nothing to eat, drinks lemon barley water (rich mixture with salt added) and lemonade.

(The following is extracted from "The Don Thompson Story" Modern Athletics, England, December 1960, with permission of the publisher.)

1. Heat Treatment. I was a bit scared of the heat prospect, and had great fear of failing as I did in Melbourne, because of the heat. So came the much publicised bathroom treatment. During the three months prior to the Games, there were nearly 20 sessions of $\frac{1}{2}$ to $\frac{3}{4}$ hours duration in an atmosphere of 100 degrees F, with a humidity around 55. I am sure this was a great help.

2. Relaxed Training. In mid-August, some three weeks before the race, I spent a very vigorous week in the Lake District on my own. The lovely fells provided a training ground with which I doubt even the much publicised Australian Portsea can compare, for a walker anyway. Some 150 miles of fast walking were indulged in. Then, being on my own for long hours each day provided opportunity for plenty of uninterrupted thought about Rome prospects, and the walkers who might upset my hopes. There was a lot of very pleasant day dreaming, inducing a form of self-hypnosis, which in turn was used to strengthen the will and boost the spirit to a high degree of exhilaration. So I went to Rome very relaxed.

3. In Rome. I normally consider myself as fairly active, but the four days spent in Rome prior to the race were unusually quiet and restful. The only training was three very short sprints on the roads round the village. Most of the time was spent resting on my bed or in deck chairs in the shade of the buildings, just summoning up enough strength for a journey to the restaurant to eat light meals.

No energy was wasted shopping or sightseeing. In fact, I only left the village twice, once to motor over the course, and the second time to inspect the exit from the stadium and the first mile of the course.

NIGEL THOMPSON

Nigel Thompson. Metropolitan Walking Club, London.

Best times: 1 mile 7:21; 2 miles 15:11; 7 miles (track) 55:30; 7 miles (road) 54:17; 10 miles 80:04; 20 kilo (road) 101:19; 20 miles 2:51:52; 50 kilo 4:38:01; London to Brighton, 53 miles, 8:28:30. Born: Hillingdon, Middlesex, England. June 11, 1934. Height: 5ft. 7in. Weight: 142 lbs. Started race walking in 1952 at age 18 years. R.A.F. 20 kilometers champion.

PRE-TRAINING WARM UP: Seldom except for track training.

PRE-RACE WARM UP: 10 minutes session starting 45 minutes before race. Slow walking (10 minute mile speed) with a few 50 to 100 yards sprints in latter half, stretching exercises. Finishes warm up 5 to 10 minutes before start of race. Trains year round.

TRAINING FOR 3,000 AND 10,000 METERS.

Sun. 15 to 20 miles; $5\frac{3}{4}$ to 6 miles per hour.

Mon. to

Thu. Usually 3 sessions - 2 stripped 5 to 7 miles and 1 x 8 to 10 miles outing at 6 to $6\frac{1}{2}$ m.p.h. pace.

Fri. Rest.

Sat. Race or 12 to 15 miles at 7 m.p.h. pace.

Trains on own mainly. Has no coach but useful advice from Harold Whitlock. Enjoys hill walking, rock climbing, skiing and skin diving. Pre-Race meals: 2 to 3 slices of bread-butter and honey, and tea 2 to 4 hours before race. During 50 Kilo: Takes orange drink with glucose and salt, effervescent lemonade. very long races. 15 upwards per day: Not recommended for serious walking."

Trains alone for road events - has no formal coach but has received invaluable advice and help from Harold Whitlock. Trains for style. Plays an odd game of cricket and table tennis. Pre-

Race meal: Depends on distance and time of start - usually scrambled eggs (2) about 3 hours before middle distance event. During 50 Kilo: Eat nothing, drink strong well sugared lemon barley water or lucozade.

ARTHUR GILBERT RAMSAY THOMSON

Arthur Thomson. Hounslow, Middlesex, England. Metropolitan Walking Club.

Best times: 2 miles 14:11.4; 5 miles (track) 37:26; 7 miles (road) 51:40; 20 kilo (road) 94:35; 20 miles (track) 2:47:33; 20 miles (road) 2:47:20; 50 kilo 5:03:00. Born: Cardiff, Wales. April 22, 1936. Height: 5ft. 11in. Weight: 161 lbs. Started racing 1950.

PRE-RACE WARM UP: No warm up for road events except $\frac{1}{2}$ mile run in cold weather. Track. 1 miles at steady pace 8 mins. to 8:15 pace, sometimes with 100 yard bursts in straight for last couples of laps, finish off with few minutes stretching exercises. For 7 to 15 mile events, about 1 mile steady walking interspersed with a few sprints of 100 yds. about 20 to 30 minutes before event. Stretching exercises, particularly shin muscles. Longer spins for the shorter events and visa versa.

TRAINING: Says: "The season here is all the year round so there is no pre-season training. My training does not differ very much for different distances. In general, training is planned for optimum performance at 20 kilo, but aiming to cover all distances from 2 miles to 50 kilo., but, of course, taking the very short and long races less seriously. As an example, the following is a summary of training during February, March, and April, 1961, during which most of my best performances between 7 and 20 miles were made": Number of sessions per week, incl., racing (average) 5.2; average weekly mileage, 52; made up of averages: track training (intervals) 1 session, 6 miles per week. Road training, $2\frac{1}{2}$ sessions, per 1 week, 23 miles per week. Strolling, 3 sessions, per 4 weeks, 13.5 miles per week. Racing, 1 session, per 1 week, 9.5 miles per week.

This is usually made up as follows:

Sun. Stroll. 15 to 25 miles.

Mon. Easy road training 10/15 miles.

Tue. Track, 1 mile warm up, 15/20x440 yards with 220 yards, rests in 1:47 - 1:52 with every 5th lap, extra fast (target 1:40) or, 15x440 yards with 440 yards rest in 1:43/1:47.

Wed. Road training, faster than Monday, 6 to 12 miles.

Thu. 6 miles road or rest before important race.

Fri. Rest.

Sat. Race.

"Having started smoking at college, I find it difficult to give up for more than a few weeks at a time, and have done some unscientific experiments on the effects of various levels of smoking on racing performance. My conclusions, for what they are worth are: Up to 5 cigarettes per day: No noticeable effect at all, but it is easier to give up altogether than keep it at this level. 5 to 10 cigarettes per day: no effect so long as none or very few smoked for 24 hours before a race. 10 to 15 cigarettes per day: Giving up after a few weeks at this level results in an improvement of about 30 seconds, in 7 miles, but little effect on

V. UKHOV

V. Ukhov. U.S.S.R. Olympic Representative 1952. European Games 50 kilometers Champion 1954.

Best times: 50 Kilometers - 4:18:49.2.

WARM UP: Slow running for about 2 kilos, followed by loosening, bending, and stretching exercises, then slow walking interspersed with short bursts and walking fast in circles. Total time about 22 minutes.

TRAINING FOR 50 KILOMETERS. Schedule July, 1954.

1st Week:

Fri. 25 kilos medium pace road walk followed by a bath.
Sat. 1½ hours slow run.
Sun. Rest.

2nd Week:

Mon. 22 kilos walk with arms lowered.
Tue. 5x2 kilos fast walk on road.
Wed. 1 to 1½ hours rowing.
Thu. Rest.
Fri. 40 kilos medium pace road walk.
Sat. 11 kilos slow run, bath.
Sun. 9 kilos stroll, 10 kilos varied fast and slow and running.

3rd Week:

Mon. 20x400 meters on road, 3 to 5 kilos brisk walk.
Tue. Rest.
Wed. 2x3 kilos fast workout on track.
Thu. 20 kilos run in woods.
Fri. 15 kilos fast walk on road.
Sat. Bath.
Sun. 4x400 meters fast, 2x220 meters fast, then 3 kilos easy run.

4th Week:

Mon. 30 kilo race.
Tue. 10 to 12x2 kilos on road.
Wed. 5½ hours walk in woods.
Thu. Rest.
Fri. 25 to 30 kilos medium pace walk on road, increasing speed at each 5 kilo.
Sat. 1½ hours workout in woods-running, walking, jumping etc.
Sun. Rest.

5th Week:

Mon. 10 to 15 x 1 kilos on road, with 200 meters rests.
Tue. 1½ hours workout in woods-running, walking, jumping etc.
Wed. 3½ hours workout in woods-running, walking, jumping "
Thu. 3 to 4 kilos easy run in woods.
Fri. 45 kilos race.
Sat. 1 hour walk in woods.

Note: This schedule is from "Race Walking" compiled by D.I. Kozlovskim, Trainer of Light Athletics of U.S.S.R., published in Moscow in 1955.

COLIN WILLIAMS

COLIN WILLIAMS

Colin Williams. Ilford Athletic Club, Kent, England.

Best times: 1 mile 6:45; 2 miles 13:45.6; 5 miles 36:17.6; 7 miles (track) 51:47; 10 miles (road) 77:40; 1 hour, 8 miles 170 yards (track). Born: Ilford, Essex, England. June 30, 1935. Height: 5ft. 11½in. Weight: 147 lbs. Started race walking in 1951 at 16 years. Essex County Champion at 2, 7, and 10 miles.

PRE-TRAINING WARM UP: 5 minutes loosening up exercises and then about 1 mile steady walking, getting faster as loosens up.

PRE- RACE WARM UP: 5 to 10 minutes loosening up exercises, steady walking for 15 minutes but if for a two miles event, does a few sprints at about 1½ times racing pace. Trains all year round; has no coach but has attended weekend coaching courses by Harold Whitlock.

TRAINING FOR 3,000 METERS.

Tue. Warm up then 8 to 12 440 yards at 1:40 to 1:43 pace with 220 yards recovery. 2 to 3 miles steady walking at 7:40 to 8 minutes mile pace, warm down 880 yards. Total time 60 to 75 minutes.
Thu. Warm up then 4x220 yards at 45 to 50 seconds - 110 yards recovery. 4x330 yards at 70 to 75 seconds - 220 yards recovery. 1 or 2 miles steady walking at about 7:45 pace. Warm down. Total time - 60 to 75 mins.

TRAINING FOR 10,000 METERS.

(a) Summer for track.

Tue. Warm up - 8 to 10x880 yards at 1:45 to 1:40 laps, 3 to 4 miles at 7:45 to 8 minutes per mile. Total 60 mins.
Thu. Warm up - 3 to 4 miles at varying speeds 7:20 to 7:50 mile pace then 8x220 recovery. Total 60-75 mins.

(b) Winter on road.

Tue. Steady walking for about 7 miles - 56 to 60 minutes.
Thu. 3 or 4 miles round park paths at varying speeds with several speeds with several up-hill sprints. Total time 45 to 60 minutes.

Trains on Tuesday with clubmates, Thursday alone. For relaxation, plays tennis up to 3 hours per week at times, says he is not very good. Does no weight training now but did benefit from it 2 years ago. Uses calisthenics only for warming up before training.

Style Training: Places a lot of importance on good style and always tries to correct defects when pointed out by judges or friends. Trains for style early in track season. "I have never let training rule my life as can be seen from the fact that I only train twice a week, sometimes only once. At the beginning of the 1961 track season, I only trained twice in the four weeks prior to the A.A.A. 7 miles Championship in which I finished second in 53:08. I admit that my lack of training accounts for my slower times over 10 miles, but my main object in to enjoy my walking."

Pre-Race meal: Eats anything served providing it is 3 hours before race; has eaten a large steak an hour before minor race events without troubles, and registered 54 minutes for 7 miles.

RONALD L. ZINN

RONALD L. ZINN

Ron Zinn. Olympic representative U.S.A., 1960.

Best Times: 1 mile, 6:43.3; 1 mile indoors, 6:31.4; 2 miles, 15:02; 10 miles (road), 1:18:47; 20 kilometers, 1:35:58; 50 kilometers, 4:44:39. Born May 10, 1958. Height 5 ft. 10 in. Weight 150 lbs. Commenced race walking seriously in Feb. 1960 after a varied sporting career including football, track, wrestling and cross country running. Voted most valuable athlete of the year at Carl Sandburg High School 1956-57.

TRAINING

Trains once a day 6 to 7 days per week. Because of limited training time concentrates on very fast interval work. Runs up to 8 miles per day in the autumn for cross country running. He never covers more than 4 miles per day in the winter, but in the spring and summer months workouts are extended to 10-15 miles per day and never less than 5 miles per day. The faster the speed the less the distance. Coached by Mike Riban.

Literature for Walkers

This literature of interest to race walkers may be purchased from Track & Field News, P.O. Box 296, Los Altos, Calif. Remit with order--international money order or UNESCO coupons from foreign countries.

RACE WALKING \$1.50. Official publication of the British Amateur Athletic Association. By Harold Whitlock, Olympic Gold Medalist, 1936. Technique, training, general training aids (diet, saline drink, care of feet, sleep, hot baths, etc.), rules. Well illustrated with diagrams and action photos. 62 pages. First published 1957.

WALKING FOR ROAD AND TRACK \$1.00. By George Cummings, champion long distance walker. (Walked 420 miles in 82 hours, one mile in 6:22). Definition of walking; how to walk; faults to avoid; speed and tactics; training hints; footcare and footwear; self-massage; road adventures. 90 pages.

HOW THEY TRAIN \$2.00. Training schedules and programs for runners from 880 yards to six miles. But the schedules and accompanying articles hold much of interest to the walker who is anxious to learn all he can about training.

TRACK TECHNIQUE \$3.00 for a one year subscription (four issues). As many of the problems of conditioning and care of the body are the same for the walker as for the runner this technical journal holds much of value to the walker.

World Records

20 miles	A. Vedjakov, USSR	2:31:33	8/23/58	Moscow
30 miles	S. Lobastov, USSR	4:07:11	8/23/58	Moscow
20 kilos	V. Golubnichiy, USSR	1:27:05	9/23/58	St'ngrad
30 kilos	A. Egerov, USSR	2:17:16.8	7/15/59	L'ngrad
50 kilos	S. Lobastov, USSR	4:16:08.6	8/23/58	Moscow
2 hours	A. Egerov, USSR	26,429m	7/15/59	L'ngrad

PENDING

50 kilos	A. Pamich, Italy	4:14:02.4	11/10/61	Rome
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Olympic Results

LONDON, 1908

3,500m	1. Larner, George	Great Britain	14:55.0
	2. Webb, Ernest	Great Britain	15:07.4
	3. Kerr, Harry	Australia	15:43.4
10 miles	1. Larner, George	Great Britain	75:57.4
	2. Webb, Ernest	Great Britain	77:31.0
	3. Spencer, Edward	Great Britain	81:20.2

STOCKHOLM, 1912

10,000m	1. Goulding, George	Canada	46:28.4
	2. Webb, Ernest	Great Britain	46:50.4
	3. Altmani, Fernando	Italy	47:37.6

ANTWERP, 1920

3,000m	1. Frigerio, Uργο	Italy	13:14.2
	2. Parker, George	Australia	
	3. Remer, Richard	U.S.A.	
10,000m	1. Frigerio, Uργο	Italy	48:06.2
	2. Pearman, Joseph	U.S.A.	
	3. Gunn, Charles	Great Britain	

PARIS, 1924

10,000m	1. Frigerio, Uργο	Italy	47:49.0
	2. Goodwin, George N.	Great Britain	
	3. McMaster, C.C.	S. Africa	

LOS ANGELES, 1932

50,000m	1. Green, Thomas	Great Britain	4:50.10
	2. Dalinsh, Janis	Latvia	4:57.20
	3. Frigerio, Uργο	Italy	4:59.6

BERLIN, 1936

50,000m	1. Whitlock, Harold	Great Britain	4:30.41
	2. Schwab, Arthur	Switzerland	4:39:09.2
	3. Bubenko, Adalberts	Latvia	4:32:42.2

LONDON, 1948

10,000m	1. Mikaelson, John	Seden	45:13.2
	2. Johansson, Ingerman	Sweden	45:43.8
	3. Schwab, Fritz	Switzerland	46:00.2
50,000m	1. Ljunggren, John	Sweden	4:41:52
	2. Godel, Gaston	Switzerland	4:48:17
	3. Johnson, Tebbs	Great Britain	4:48:31

HELSINKI, 1952

10,000m	1. Mikaelson, John	Sweden	45:02.8
	2. Schwab, Fritz	Switzerland	45:41.0
	3. Iouk, Bruno	U.S.S.R.	45:41.0
50,000m	1. Dordoni, Giuseppe	Italy	4:28:07.8
	2. Dolezal, Josef	Czecho.,	4:30:17.8
	3. Roka, Antal	Hungary	4:31:27.8

MELBOURNE, 1956

20,000m	1. Spirine, L.	U.S.S.R.	91:27.4
	2. Mikenas, A.	U.S.S.R.	92:03.0
	3. Iouk, B.	U.S.S.R.	92:12.0
50,000m	1. Read, Norman	New Zealand	4:30:42.8
	2. Maskinskov, E.	U.S.S.R.	4:32:57.8
	3. Ljunggren, John	Seden	4:35:02.8

ROME, 1960

20,000m	1. Golubnichiy, V.	U.S.S.R.	94:07.2
	2. Freeman, Noel	Australia	94:16.4
	3. Vickers, Stanley	Great Britain	94:56.4
50,000m	1. Thompson, Don	Great Britain	4:25:30
	2. Ljunggren, John	Sweden	4:25:47
	3. Pamich, A.	Italy	4:27:55

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Also, Profiles of Charley Clark, John Cramer, Deacon Jones, Adrian Metcalfe, Paul Winder, Robbie Brightwell, and others; Track Nuts Quiz; German Juniors Lead the Way; That Funny Man From Australia (Percy Cerutti); Olympic Year in Israel; 1961 Relay Rankings; Former World Record Holder Buddy Davis (high jump); Professional Starting Techniques; Cross Country Preview; Maccabiah Games Report;

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