RACE WALKING

by

HAROLD H. WHITLOCK

(Olympic Gold Medallist 1936)

AMATEUR ATHLETIC ASSOCIATION

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INSTRUCTIONAL BOOKLET

AMATEUR ATHLETIC ASSOCIATION
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Contents

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E. STRICKLAND.

Foreword

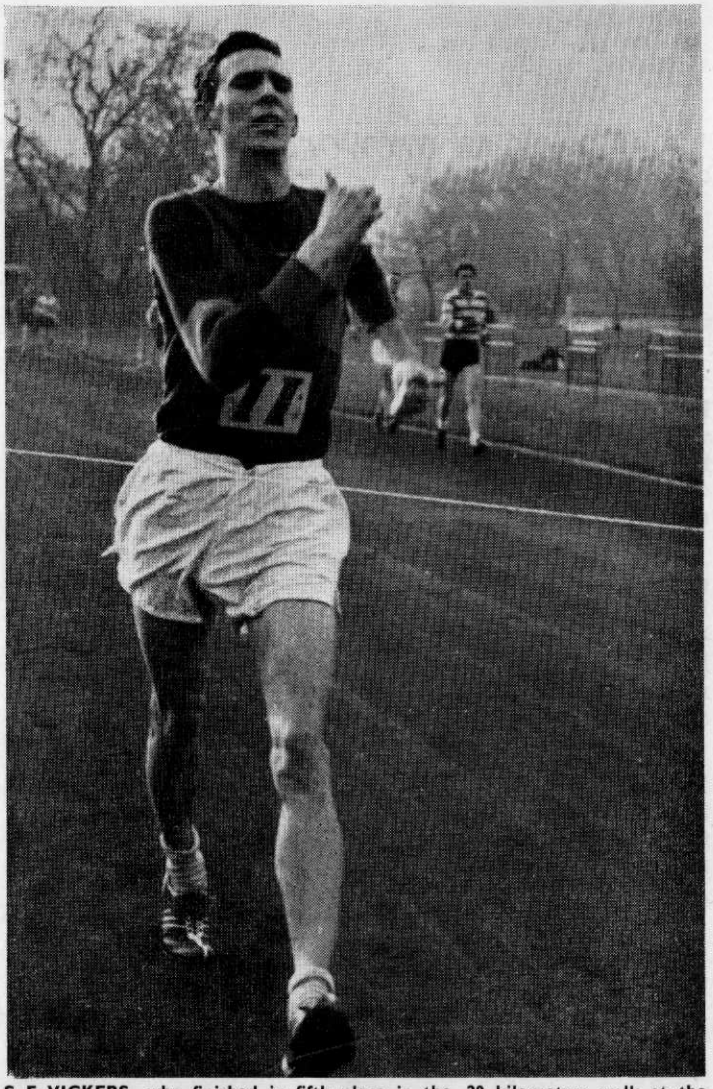
by

A. H. POPE

ALTHOUGH many books about Athletics have been written during recent years, there has not been one devoted entirely to race walking, and this work by Harold Whitlock will meet a long-felt need. But it is to be welcomed not only for this reason. Its real merit is in the fact that it is a first-class production on this difficult branch of athletics and that it will be of incalculable value to all race walkers.

It is remarkably comprehensive and nothing which is likely to be of use to the would be champion has been omitted. But it is not only for the aspirant to championship honours. Every walker can derive benefit from it and from trying for himself the advice it gives. How much effort (so often wasted) many of us would have been spared had such a manual been available when we were learning!

It is a "how-to-do-it book" by a man who not only knows how to do it, but did it with outstanding success and distinction. I commend it, without reservation, to all present and future race walkers and take this opportunity, on their behalf, to thank Harold Whitlock for writing it and the Amateur Athletic Association for arranging its production.



S. F. VICKERS who finished in fifth place in the 20 kilometres walk at the Melbourne Olympic Games and whose style of walking met with universal approval.
It is interesting to note the forward thrusting left hip and the well braced rear leg contributing to the effective stride.
The rather high arm movement is necessary as a counterpoise for the leg thrust, due to the comparatively light frame, but is still well contained.

Race Walking

1. Introduction

Chacun à son goût is probably the answer to question of why walk when it is quicker to run. Indeed it would be a dull world if we were all cast in the same mould.

The pattern of physical recreation is so wide and complex that it would be foolish to assume that any one form was the best. Suffice it to say that walking is one of the oldest and cheapest forms of attaining a high degree of physical fitness. It can be used to stimulate wellbeing in a body that is at loggerheads with the mind, whether in congenial country surroundings, or in swift pursuit of others round a track. In between, at varying speeds, are the forms it can take; through the strollers 5 miles in the hour, to the road race of 7 miles in the hour and the track event in which 8 miles can be exceeded.

It has two very great points in its favour in that it can be practised almost anywhere and the benefits derived can be enjoyed, and put to use, through a complete lifetime. Even when competition is a thing of the past.

Of course it is easier and quicker to run 7 miles than to walk that distance, but we are dealing with athletic prowess which demands, for its capable execution, a well developed muscular system, a finely developed skill, tenacity and mental application. As such it is the final lesson on how to use the limbs to their best advantage when walking at all times.

The rules applicable to competition demand discipline in control of action, and acceptance, without demur, of an umpire's decision.

Our sporting history is rich in pedestrian prowess and the A.A.A. 7 miles track championship, carrying with it the Chambers Vase, is among our oldest national championships.

Besides the 7 miles event the Amateur Athletic Association provides track championships at 2 miles for seniors and 1 mile for juniors and youths.

The Race Walking Association promotes championships on the Road at distances of 10 miles, 20 miles and 50 kilometres for seniors and 5 miles for juniors, while its area associations and clubs promote races at all distances from 1 mile to 100 miles throughout the year. In following, and

numbers of clubs, we are stronger than any other country and with this advantage should dominate international walking events.

Indeed, of the 11 walking events so far held in the Olympic Games, Great Britain has provided 3 winners in C. E. Larner (1908), T. W. Green (1932) and H. H. Whitlock (1936), while no fewer than 19 of our representatives have been placed in the first six.

These events have varied in distance from 3,000 metres to 50,000 metres. From the records it would seem that we have generally enjoyed initial success as the distance varied, only to lose this supremacy later, and it is hoped that this booklet will assist in raising our standard of walking to a point whereby we may once again head the table while raising our club standard of performance.

2. Rules

INTERNATIONAL AMATEUR ATHLETIC FEDERATION

Rule 45 Walking

1. *Definition.* Walking is progression by steps so taken that unbroken contact with the ground is maintained.
2. *Judging.* Judges of walking must be careful to observe that the advancing foot of the walker makes contact with the ground before the rear foot leaves the ground ,and in particular, that 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.
3. *Judging and Disqualifications.* The appointed Judges of Walking shall elect a Chief Judge. All the judges shall act in an individual capacity. When, in the opinion of:
   (a) two of the Judges, one being the Chief Judge
   or
   (b) three Judges other than the Chief Judge,
   a competitor's mode of progression fails to comply with the definition during any part of the competition he shall be disqualified and informed of his disqualification by the Chief Judge. In no circumstances shall two Judges of the same nationality have the power to disqualify.
4. Effect may be given to any such disqualification immediately after the conclusion of the competition, if circumstances render impracticable an earlier notice to the competitor of his disqualification.

5. A competitor may be cautioned when by his mode of progression he is in danger of ceasing to comply with the definition of contact; but he is not entitled to a second caution. The decision to caution a competitor shall be made under the same procedure as for disqualification set out in para. 3.
6. In track races a competitor who is disqualified must immediately leave the track, and in road races the disqualified competitor must, immediately after his disqualification, remove the distinguishing number or numbers which he is wearing.
   NOTE. It is recommended that a system of signalling "caution" by white flag and "disqualification" by red flag be used as far as possible during a walking race for the information of officials, competitors and spectators.
7. In all international races of 50 kilometres (or 30 miles) and over, refreshments shall be provided by the organisers, and refreshment stations shall be arranged at 10 kilometres or 6 miles, and thereafter at every 5 kilometres or 3 miles. No refreshment may be carried or taken by any competitor other than that provided by the organisers, but the athlete may specify the type of refreshment desired.
   If a race of 50 kilometres or 30 miles takes place on a track, a competitor may receive refreshment after one hour from the start of the race, the refreshment station being arranged at a position near the finish.
8. Each competitor must send with his entry for a race of 50 kilometres or 30 miles or over a medical certificate from a qualified doctor certifying his fitness to take part in the race. Each competitor shall be required to take a physical examination before the race by a qualified doctor who shall be appointed by the organisers. If the doctor considers it dangerous or inadvisable the competitor shall not be allowed to start or continue in the race.

AMATEUR ATHLETIC ASSOCIATION & RACE WALKING ASSOCIATION

1. *Definition.* The same as the I.A.A.F.
2. *Judging and Disqualification.* Any competitor whose mode of progress does not comply with the Definition of Walking to the entire satisfaction of any judge or judges shall be disqualified. Any competitor disqualified by a walking judge must at once retire from the competition.

In Road events, disqualified competitors must immediately remove their numbers, whether requested to do so or not, and on no account pass the recorders at the finish. Walking on the footway and pacing are prohibited. The judges are empowered to disqualify any competitor failing to comply with these conditions.
Attendance is permitted in events over 10 miles, but not before 7 miles has been covered.

These are the particular event RULES and in all other respects the Laws and Competition Rules of the Amateur Athletic Association apply.

It will be seen, that while the definition is the same in both international and home competition, there is a variance in the judging application, for while in international events it is necessary for two judges of walking to agree and one caution may be given, in this country there are NO cautions and each judge acts quite independently.

A number of governing bodies of walking abroad also have additions to their respective definitions regarding technique or "style" employed and it is generally the confusion thus existing when applying the International rules which leads to controversy in these events.

3. Technique

(*a*) General

The technique herein advocated will be acclaimed as good walking wherever and in whatever country the sport is practised.

First look at the definition and in particular to that part which reads "unbroken contact with the ground".

To conform to this it becomes obvious that the spring imparted when running, with a powerful drive from the rear leg, is not acceptable as this would immediately cause a "break in contact". What is required is a rather less explosive means of propulsion—one that gives full forward thrust without body lift at all, and in an economical manner. Since one foot must always be touching the ground, the system of movement used becomes one of pure leverage working from heel to toe as points of resistance to the ground, and the legs through the pelvis supporting and carrying forward the trunk.

This is all very elementary and, in a small or large degree, was mastered at the tender age of 14 months or so when

first bridging the chairs without falling flat. Certainly enough is learned at an early age to get by, but for those who wish to walk far, very fast, or a combination of both, there is need to study economy of energy, because a great wastage can occur in lifting the trunk as it is levered forward in the stride that should not be tolerated.

A walker 6 ft. in height and weighing 11 stones (70 kg.) will take a stride up to 4 ft. in length (average 4/7 height), while the walking height (Fig. 1) will vary, through the leg angle opening and closing, some 4 in. to 5 in. The head and trunk of such a walker will weigh some 84 lb. (38 kg.) and so a great wastage of energy can be expended while walking a mile by lifting and lowering this weight some 1,320 times through this distance. It would be equivalent to walking up a gradient of approximately 1 in 10.

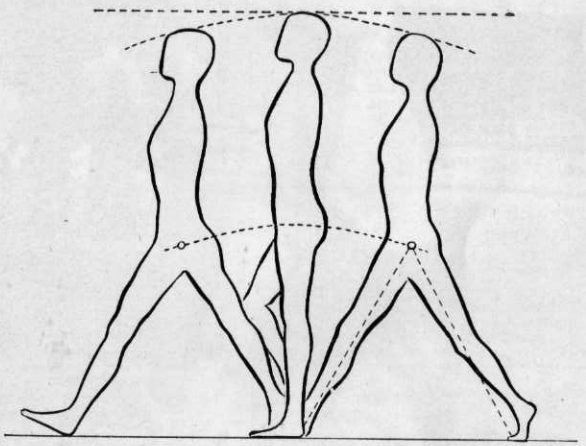
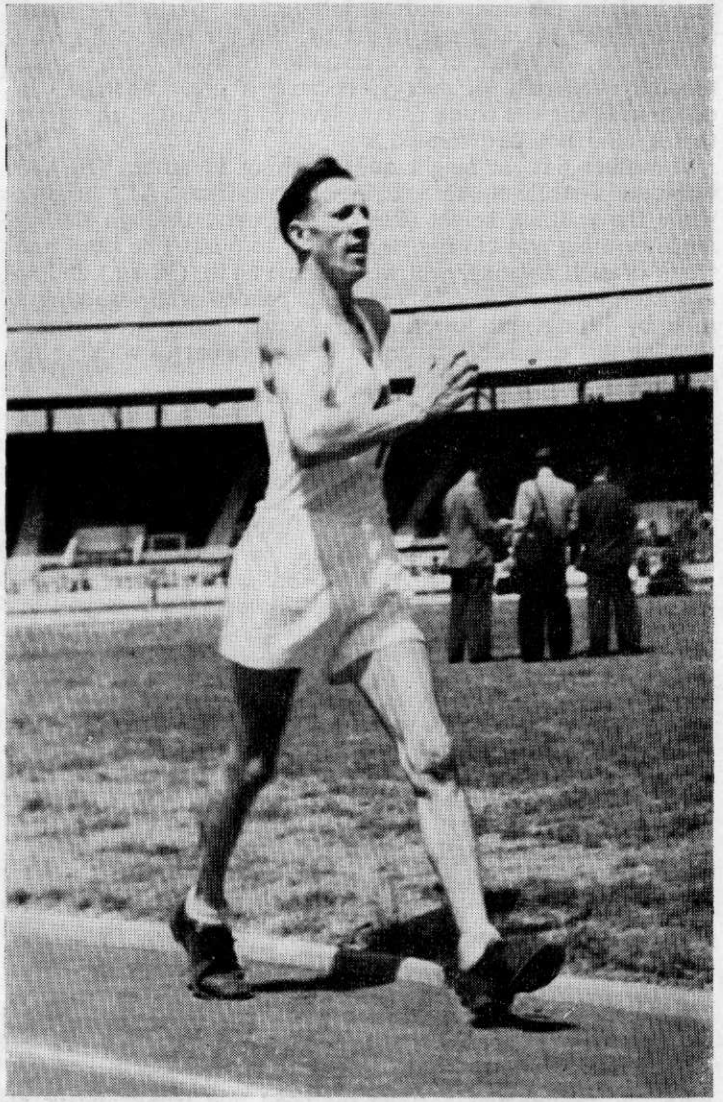


FIG. 1
Showing the amount by which the body is raised and lowered without using hips.

Some means must therefore be sought to carry this large bulk without the attendant lift: i.e. with the head always remaining the same height from the ground, thus maintaining a constant centre of gravity.

The problem then becomes one of always being in touch with the ground and keeping the head and trunk always at the same mean height. The height chosen being that of the walker at the full stride position.



5th, OLYMPIC 10,000 METRES 1952
A good action study of G. W. COLEMAN taken just before Helsinki 1952.

In this respect he can be likened to the cyclist whose effort is confined to a machine tied to the ground through its wheels. He may, by rising in the saddle, use his weight to break down the initial inertia of his machine but as soon as he is under way it is compact smooth movement, from the saddle position, that gives the best results. For both cyclist and walker attention to maintaining a constant centre of gravity is the essential of progressive speed.

(*b*) Hips and Pelvis

Having set the principle of single plane movement, i.e. a fixed walking height, with a constant centre of gravity, we must also show the means of attainment and for this we can well study the body skeleton round the hip girdle for the main solution.

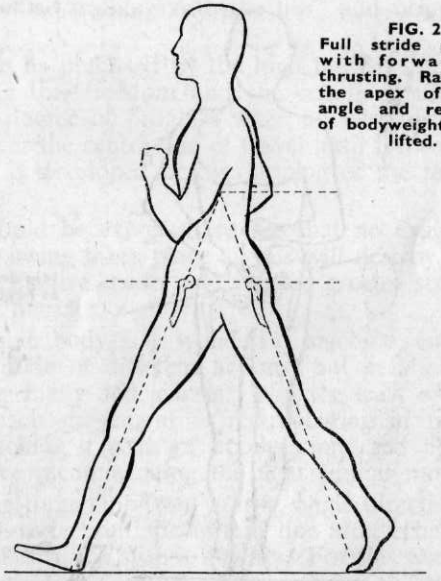


FIG. 2
Full stride position with forward hip thrusting. Raising of the apex of stride angle and reduction of bodyweight to be lifted.

Look at Fig. 2. The thigh of the rear leg is presenting a force to the hip through the pelvic bone at each stride. This force is supporting the body weight and, at the same time, levering it forward. If, as this leverage is taking place, the opposite hip is thrust forward rotating the hip girdle two things are attained:

(i) The angle made by the legs at full stride is lessened (Figs. 1 and 2).

(ii) The apex of the triangle thus formed is raised considerably leaving less height to be affected by the changing position of the legs.

By the execution of this movement we are half-way to arriving at a fixed walking height, and to complete it we must also show the continuation from the full stride now reached.

The forward foot has made contact, with the hip of that leg also thrust forward leaving the opposite hip behind. Now, as the rear leg is withdrawn from the ground and is in process of being abducted under the body its attendant hip is allowed to drop, reaching its lowest point as the feet are about to pass one another (Fig. 3).

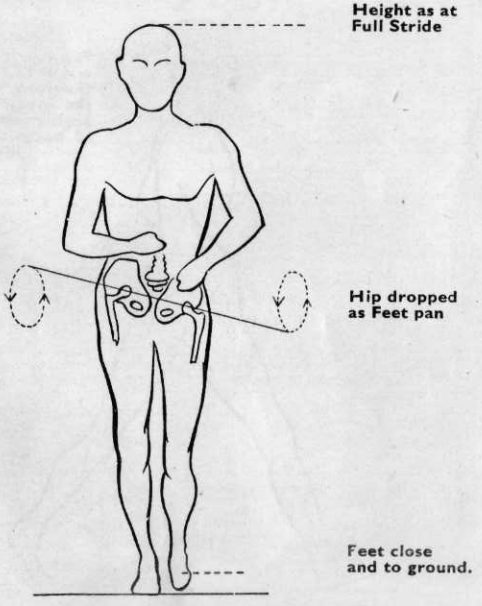


FIG. 3
Paddle movement of hip girdle rotation with hip of recovering leg dropped as feet pass.

Since the thrusting forward of the hip in the first movement and the dropping of the hip in the second are in separate planes—one horizontal and the other vertical—a merging is necessary, and this, in a complete movement of both left and right legs, represents a circular movement of each hip socket

—starting high while supporting—rotating through 90 degrees to full stride, a further 90 degrees to extreme low position when passing as a free leg, climbing then 90 degrees to make forward contact and then the final 90 degrees to take up the starting position for the next cycle. If one could pass a rod through the pelvis at the hip sockets the extremes would pursue a path similar to that of a double bladed paddle in reverse (Fig. 3).

The pelvic bones in the hip girdle can do this with a very slight movement of the spine in all young people because, although the binding ligaments are very strong, they can be made supple with exercise. Only in older people, and through lack of use, do these bones get set, prohibiting their use in this manner.

When executing the hip movement correctly the walker will feel that he is "walking with the hip" and using the legs as extensions.

Exercises as practised by the high hurdler can be of value in attaining this freedom and the coach should check and assess the degree of progress when advising on foot placing (not too near the centre line of travel until full forward thrust of the hip is developed or overlapping of the feet may later take place).

Care should be exercised to see that no exaggerated side to side hip swing takes place as this will destroy balance, cut down the effective stride, and impose greater stresses on the abdominal muscles.

The human body is a wonderful machine, enabling us to do a multitude of different actions, but in a purely motive sense it has many deficiencies. Not the least of these is the fact that each movement is reciprocating in type, starting slowly, reaching a peak of acceleration, and again slowing down before recommencing the next similar movement.

While the force employed is in a single direction, energy is being built up to continue in that line after effort ceases but a contrary effort will stop it quickly. For this reason balance, and restraint of any extravagant movement that requires contrary effort in order to maintain the required direction, are important.

(*c*) **Trunk**

We have started in the middle partly because of its all important functional movement, and partly because through

the leverages imposed, all movements spring from this source and are counterbalanced or opposed either side of it.

The trunk and head should be carried in a nearly upright position, that is, within 5 degrees of a forward lean. They should be quite relaxed and give a feeling that this part of the body is "sitting" in the pelvis. To carry a backward lean imposes an unnatural strain upon the spinal supporting muscles whilst at the same time tying the hip swing, making a laggard foot at landing point. Too great a forward lean will again affect the hip swing by preventing the forward thrust. It will also present difficulty in the abduction of the rear leg and incline to premature rear leg break, thus turning the action into a runner's thrust through the calf. This fault is very current in novices when, tiring through lack of abdominal development, they endeavour to maintain the pace by resorting to the natural strength of their legs.

The importance of trunk relaxation cannot be over stressed and should extend to include the shoulder motive muscles. Obviously all groups of muscles must contract with their independent use and many in the trunk are brought into play in opposition, or to strengthen the fulcrum used in leverage, but the period of use should be kept as short as is necessary for proper function, both to preserve energy and allow ample replenishment from the blood stream. In the abdominals, which are the "hinge pin" so to speak of a walker, relaxation is necessary if the diaphragm is to operate freely and completely allowing full lung expansion in breathing.

It is for these reasons that the novice walker should make haste slowly, learning the essentials of balance and co-ordination before experimenting with too much speed work where the results may be very encouraging at first only to lead to disappointment later through maladjustment.

It is strongly advocated that all practice of the walking skill should be executed at a speed well within the compass of the walker. It being far better to make sure that each point is correct in detail before moving on, than to allow a fault to become habit and difficult to remove.

For instance, it may take several lessons to master the hip swing correctly and so get the feet to fall on the line of travel. It will pay to persevere and only gradually increase the speed of movement over short distances until these become habitual and co-ordination is complete.

The achievement of these aims can usually be assessed by the degree of rhythmic movement attained and a guide in this connection would be the lining up of two objects, one behind the other. A steady trunk and head will be signified by a corresponding steadiness in the relationship of these objects, one to another.

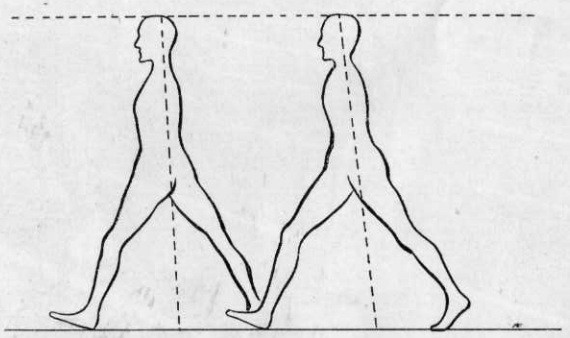
(*d*) Head

One short word about the head carriage. For balance it must be steady and preferably upright if the strain of supporting is to be equally distributed.

Why do we look towards the ground when dejected? I don't know, but I choose to think that it reflects mental condition of a poor quality, and an upright head, by the same token, signifies wellbeing and eagerness in pursuit of the task.

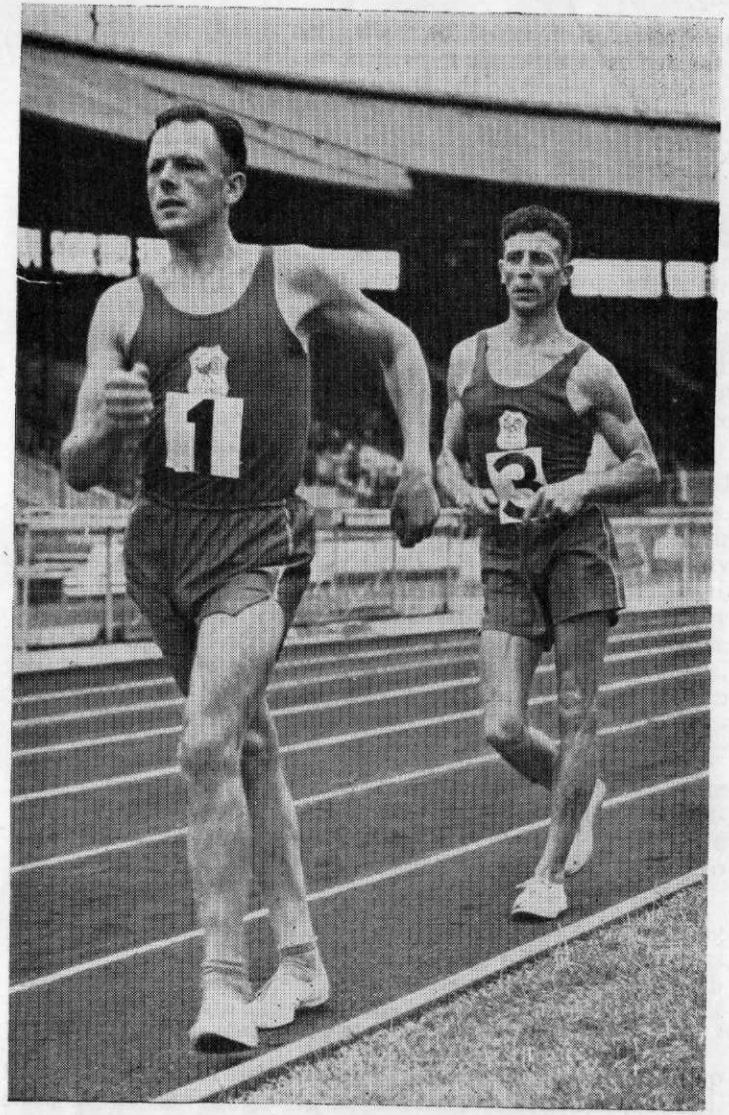
(*e*) Legs

At this stage we turn our attention to the legs, the use of which can either make or mar both efficiency of movement and degree of contact. The best starting point is probably the full stride position in which the centre of gravity is just forward of the centre of stride (Fig. 4).



Permissible lean of trunk. Rear leg with knee locked. Front knee about to lock.

Here both feet are on the ground with the full hip thrust through the lower arc assisting in putting the heel down, while still balancing on the toes of the rear foot. A line of direction drawn on the ground should just show on the inside of the heel and the big toe that is still levering forward from behind



4th, OLYMPIC 10,000 METRES 1952
L. CHEVALIER, one of France's best track walkers, using an out ward sweep of the leg in taking it through. Already the body and right arm are turning in compensation of the thrust generated.

(Fig. 5). Always of course providing that the full hip thrust is present and this thrust will, with the pelvis rotation, swing the rear foot over the line after being placed alongside.

FIG. 5
The position of feet in relation to line of travel given full hip girdle rotation.

The rear knee, at this point, is still locked with the front knee very slightly bent. The reasons behind these two points are concerned with continuous contact and maintenance of momentum. The rear 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. This leg has to be abducted largely from the pelvic origin and a slight retardation of body momentum is inevitable in compensation of this action. This will have a tendency to bring the body to a more upright position momentarily (Fig. 6).

To land on a locked front knee would still further retard momentum through initial shock at the hip socket as the weight is being transferred—but a delayed lock, taking place before the leg passes under the body, adds impetus by pulling on the pelvis through the medium of the thigh muscles.

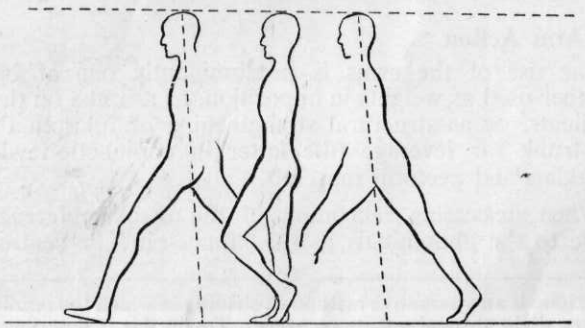


FIG. 6
Showing in one complete stride the rates of acceleration in knee and foot. Inclination of trunk reverting during rear leg abduction.

Look now at the mid-position (Fig. 6) as the feet pass one another. Here the body is directly over the supporting foot which is flat upon the ground and the hip this side is high, being at the uppermost point in its rotation. In between the knee is locked and will remain so until the stride is completed.

The foot of the trailing leg is both close to the ground and to its fellow—there being no sense in lifting it higher than necessary for clearance—the knee is already almost at its full stride position, with the hip at its lowest point.* The close ground clearance is one of the fundamental differences between walking and running. As pointed out earlier the high knee lift and vigorous drive of the rear leg would produce a lifting tendency on the trunk and consequent loss of contact with the ground.

It is interesting to study the acceleration of the knee up to this point (Fig. 6). Actuated as a short pendulum it moves quickly from the rear to attain its forward position by the time that the feet begin to pass and there is subsequently a rapid acceleration of the lower leg and foot from this point to that of full stride. In both cases the speed is about twice that of the body.

(*f*) Feet

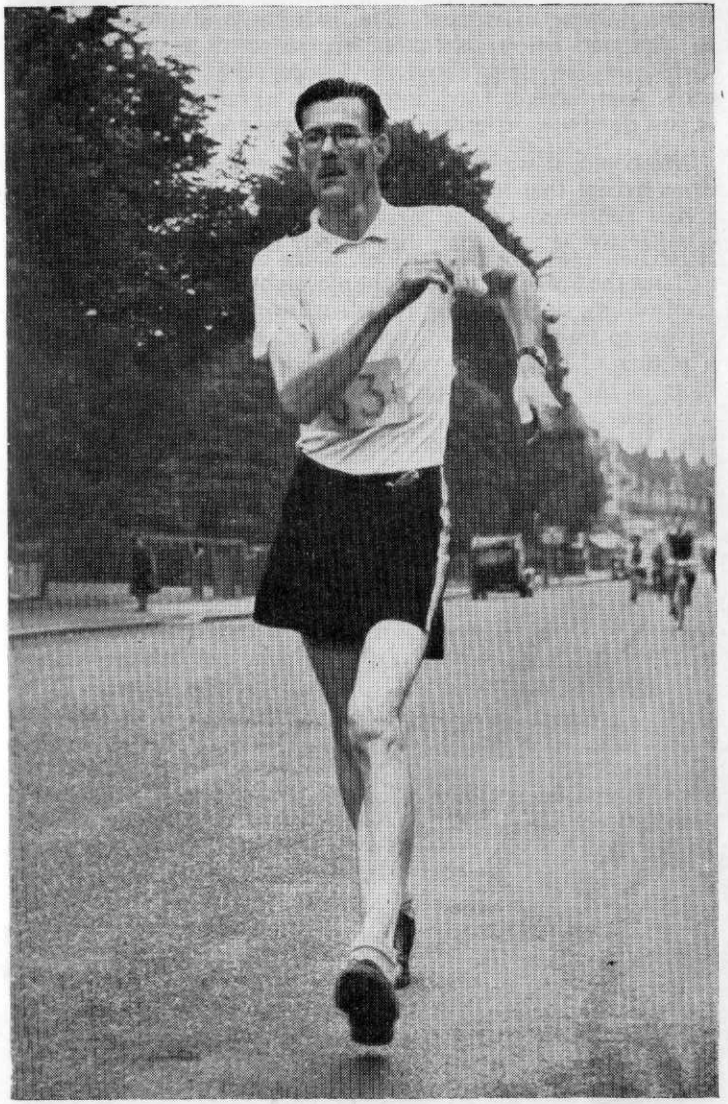
If possible the feet should land with a straight inner side as this gives the advantage of balance correction through the toes and a powerful forward leverage aiding the leg recovery. Provision of room for toe spread is for this reason an essential in shoe construction.

(*g*) Arm Action

The use of the arms is predominantly one of balance, whether used as weights in opposition, as a brake on downhill gradients, or as structural strengthening of fulcrum through the trunk for leverage (the latter in conjunction with the shoulders and pectoral muscles).

When discussing relaxation of the trunk, reference was made to the abdominals as the "hinge-pin" or centre point

* There is an alternative method of striding in which the rear leg bend is very slight throughout its recovery. To do this it describes an arc in an outward direction to arrive at its forward position. This method has obvious disadvantages in problems of balance and the use of a comparatively long slow pendulum.



4th, OLYMPIC 50,000 METRES 1952
G. B. R. WHITLOCK, whose power, derived from a frame that is lanky, needs a high arm action to control. Here the left shoulder is rising a shade high due to the full thrust through the right arm.

of the walking movement. This is because all movements on the left and below this point are reflected in contra movements on the right above, and vice versa. With each leg movement there is a twisting that has to be absorbed and this is best done over as great an area as possible to reduce fatigue.

We could, if we wished, walk quite well without using our arms except that it would become very tiring countering the forces generated by the legs on their long pendulum to the comparatively short one then at our disposal.

Thus the arms, although light in weight, can quite adequately control any such twisting force set in motion below, without having to travel far from the body or extend themselves. As a matter of economy, when the pace is slow the arms can hang at the sides with only a short forearm movement, but with the quickening of the tempo it becomes necessary to raise them, for faster reaction, into an angle by flexing the forearm.

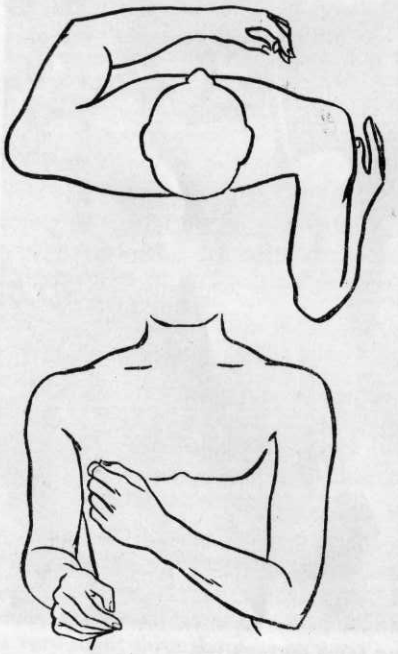


FIG. 7
Average trunk and arm relationship.

The average path of the arms used is shown in Fig. 7. The shoulders remain stationary. Elbows move back and out —forward and in. Hands from just behind the hip at the rear to some three inches in front of the opposite breast. The hands themselves should be only lightly clenched and the shoulders restrained from any tendency to rise as this fault can lead to a rising hip action and consequent faulty contact with the ground.

A short, compact, walker will often use a lower arc than his taller counterpart, due to the disparity between both length of stride and length of limb.

A summing up of the complete action would be that: "WITHIN THE DEFINITION, WALKING IS AN ECONOMICAL MOVEMENT BY LEVERAGE THROUGH THE FEET AND LEGS, ASSISTED BY THE HIPS AND BALANCED BY THE ARMS".

(*h*) Relaxation

Since the object we set out to achieve is the greatest pace, using the minimum of effort, we must avoid any growing tension in any muscle group, even in hands, face and neck.

The action itself should be moulded to give adequate relaxation between each contraction of muscle in work and in this we must not forget that the chest cavity houses the lungs on which our circulation of revitalised blood depends. Keep it always freely in action by removing any constriction, muscular or otherwise, that may impede it.

The breathing should be rhythmical and as natural as possible. Although it may be necessary to use the mouth to get sufficient intake, nasal breathing should be encouraged.

(*i*) Modification for Distance

All the foregoing refers to the technique at maximum speed as used by the sprint walker for distances up to 10 miles. Where the longer distances are concerned some modification in the action becomes necessary to still further conserve energy as the important factor: Speed meets its rival, endurance.

In sprint walking some parts are highly tried and, if put to extended use in the same degree, tend to break down. To overcome, or delay, this condition a shortened stride is the best solution as it relieves those muscles around the abdomen and hip girdle that are concerned with recovery in the action. This is all the more a necessity as, with the fall in speed, the momentum of the body is lessened and the carry over dependent upon abduction to a correspondingly greater degree. With this shorter stride an easier arm action, although not always a dropped one, can be used.

When walking uphill the body is held upright against the gravity only and the forward leg is dropped short with front knee bent to the severity of the gradient. The forward lean of the body in these circumstances does not matter as there is no longer any necessity to drop the hip or bring it forward. In fact it becomes an advantage to lift the body up the gradient.

On a down grade the action is somewhat reversed, using a long stride in front of the body and a short one at the rear. The body is still held upright against gravity but a low arm action is used in which the emphasis is on the return backward swing, retarding and holding the rear leg in position a little longer.

(*j*) COMMON FAULTS IN TECHNIQUE

1. **Head Bobbing** (shown in Fig. 1) with body lifting and lowering at each stride. This is evidence of non-existent or incomplete hip movement which it will be necessary to correct to prevent failure in contact at speed.
2. **High Knee Lift** (Fig. 8) shown with the extended foot suspended before falling to the ground. This fault, when obviously not overstriding, is due to too little hip action in a forward direction or not reaching for the ground with the hip. The condition demands a retarded rear leg break if continuous contact is to be maintained.

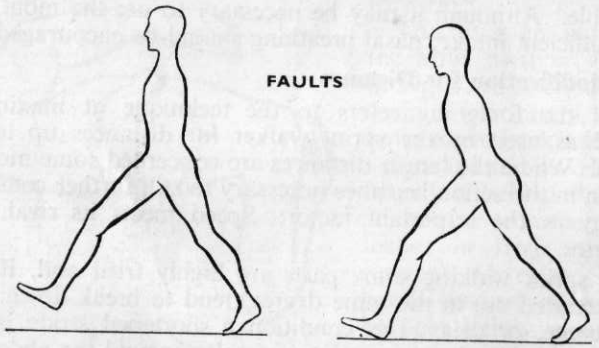
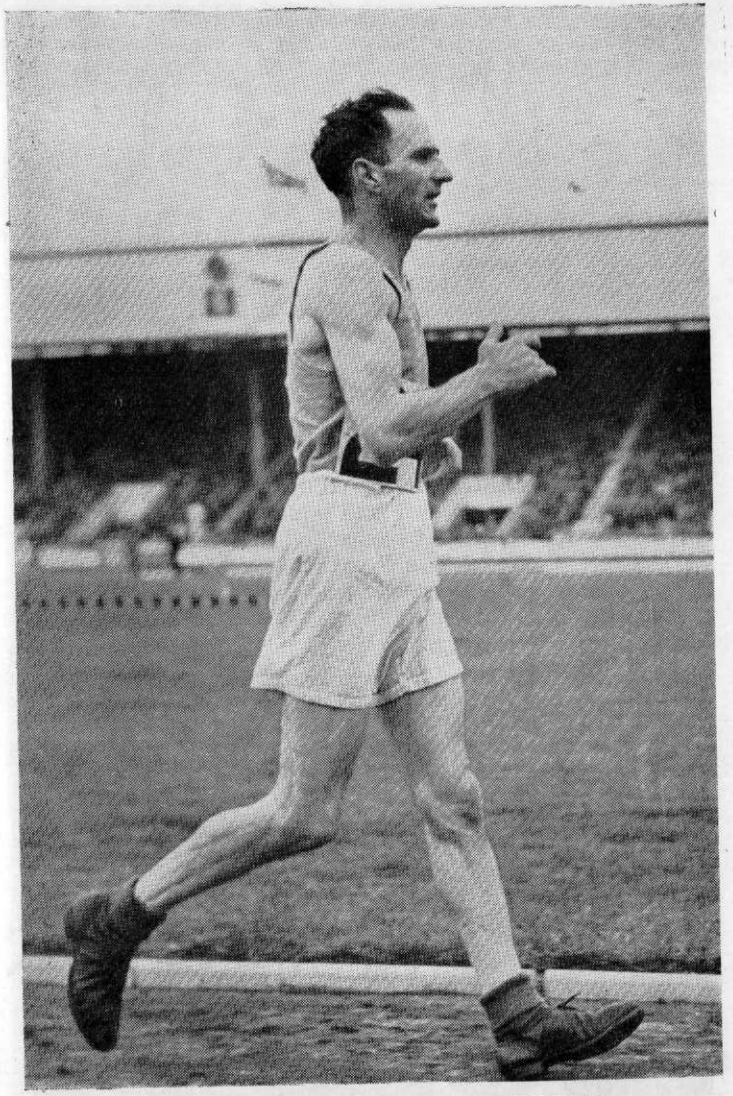


FIG. 8
High forward knee lift, suspended foot.

FIG. 9
Too much forward lean. Difficulty in abducting the rear leg.

3. **Forward Lean Too Great** (Fig. 9). A basic fault that needs immediate correction as it cramps the use of the hips and makes difficult the abduction of the rear leg. Generally abdominal strengthening and hip loosening exercises will correct.
4. **Backward Lean** (Fig. 10). This again cramps the hips and can lead to a high front foot action with lack of balance. Sometimes used with a hollow back and side to side swing of the hips in an effort to obtain freedom. Trunk exercise with leg lifting from a wall rack or suspended by the hands from a boom will assist the spinal carriage.



A.A.A. CHAMPION. OLYMPIC 10,000 METRES 1948
H. G. CHURCHER, whose style was often the cause of much controversy. He successfully exploited a short fast action with the body well forward of the centre of gravity and used no hip compensation.
The danger is that this style could easily develop into a "break" as Fault 5.

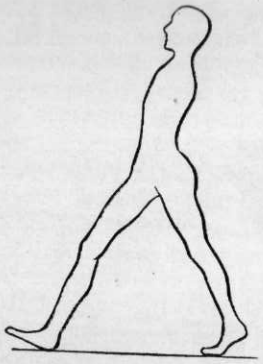


FIG. 10
Backward lean producing tension with uneven weight distribution.

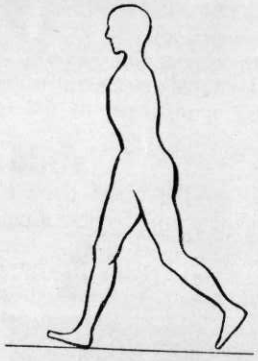


FIG. 11
Stride too short in front and rear leg breaking early.

5. **Stride Too Short in Front of Body** (Fig. 11). Here the forward leg drops short and often the rear leg breaks too soon in a snappy action with high knee lift.

The stride should be extended and attention given to the hip movement which in most cases will be found inadequate. A longer arm pendulum may also be necessary to match the longer stride.

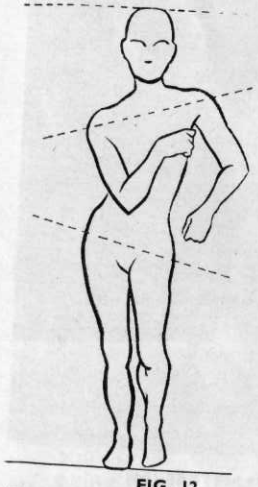


FIG. 12
Excessive side swing of hips with shoulders working hard to correct balance. An unnecessary strain on trunk.

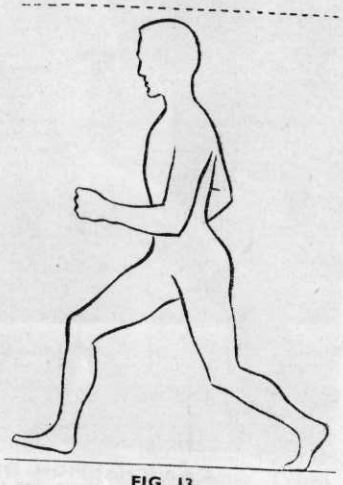
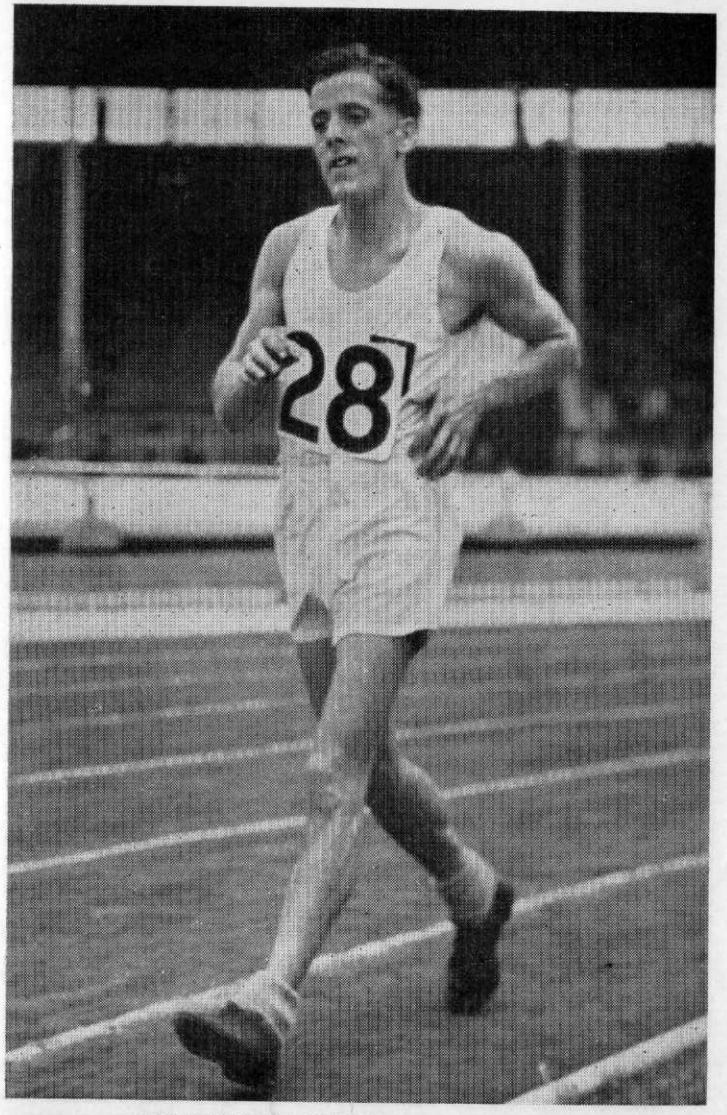


FIG. 13
The "creeper" with two constantly bent knees. Not considered fair walking.



OLYMPIC REPRESENTATIVE 10,000 METRES 1952
The very good relaxed action of L. ALLEN when winning the Inter-Counties 7 miles. In striking contrast to No. 216, pictured on page 31.

6. **Side Dip on Shoulders** (Fig. 12). There is always some slight dip as the feet pass but it must never be exaggerated or accompanied by side to side hip swing. Besides shifting the centre of gravity this fault throws a great strain upon the abdominal muscles. The cause is often over keenness in obtaining hip action. To correct, steady the shoulders and concentrate on a more direct forward hip thrust.

7. **Two Constantly Bent Knees** (Fig. 13). Although the cause may be orthopaedic it is nevertheless unpopular with all good walkers, even when it passes the definition of walking. It causes much controversy and should be discouraged from the outset. There is also little doubt that walking judges are harsh when faced with this example and in this they have the backing of the majority of race walkers. The hurdlers' exercise, but using both hands for pressure on the forward knee will help to stretch tight ligaments, and concentration on rear knee lock when walking will show an improvement.

8. **Jogging of the Shoulders,** accompanied by an up and down arm beat makes for a choppy stride as the lower limbs try to match the upper tempo. The knees begin to lift high and contact is broken. Encourage a more direct forward drive with the arms and a slight extension on the length of stride. It is also possible that the forward hip is rising too soon.

9. **Shoulders Lifting High** with the arm action, a generally high body carriage and doubtful contact. This fault is a general case of tension between the shoulder muscle groups and those in the back. An easier (more fluid) action of the arms is indicated with the shoulder blades riding freely on the back to keep them separated from the lateral dorsals. Endeavour to foster the feeling that the body is "sitting" easily in the hips.

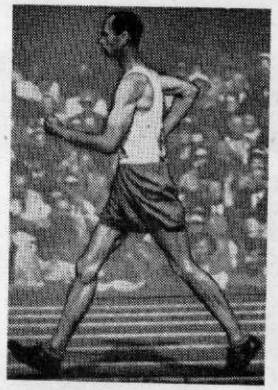
10. **Ragged, Uneven Arm Action.** Any wild swinging of the arms or one arm taking a different path to the other puts the walker out of balance and in consequence places greater strain upon the trunk than is necessary. The walker should be given a pocket handkerchief to hold by the corners. This will keep the hands always the same distance apart and when he is able to walk consistently without pulling the handkerchief taut it can then be discarded.

The result of upper trunk tension at speed. Looseness of the hip girdle has been lost and the walker has gradually pulled himself off the ground. (Fault 9). See L. Allen on page 29.

This action strip of

JOHN MIKAELSSON

taken while successfully defending his 10,000 *metres walk title at the Helsinki Olympics, is well worthy of study. Points to note are the easy body carriage, controlled arm movement, forward reaching hip and leg extension. While overall there is a picture of relaxation that belies the speed at which he is walking. His time in this final was* 45 *min.* 2·8 *sec.*



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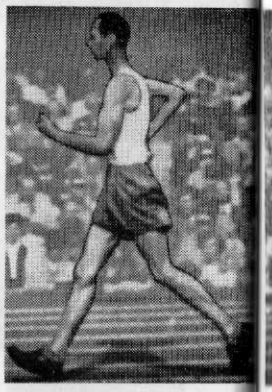

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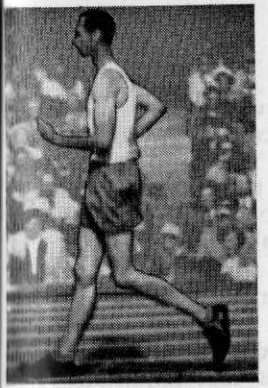

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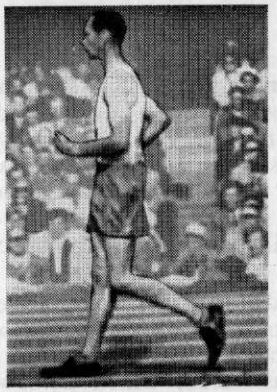

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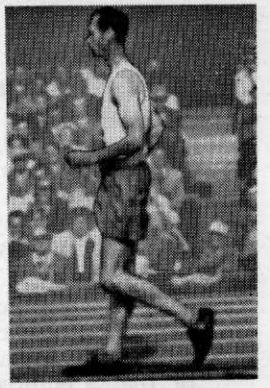

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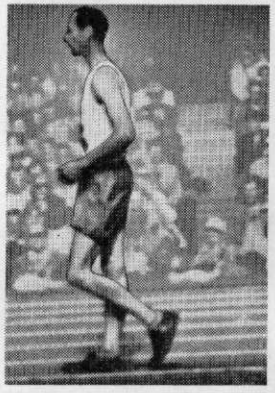

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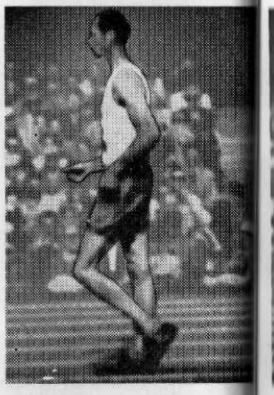

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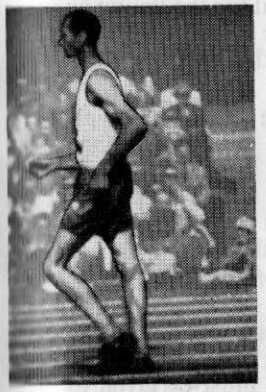

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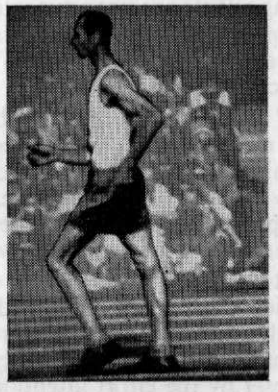

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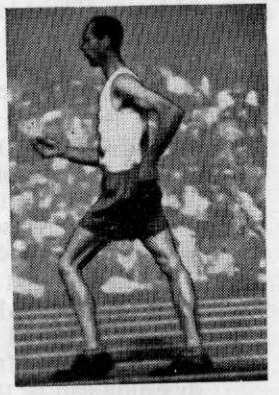

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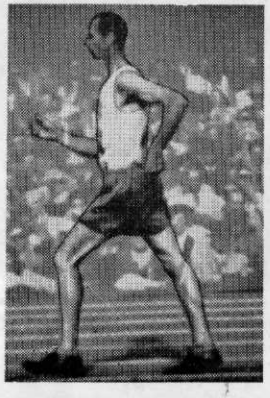

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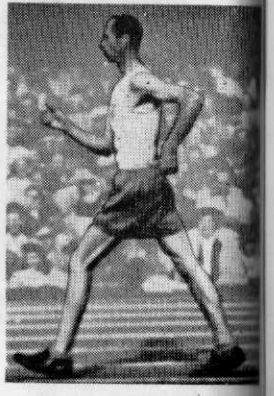

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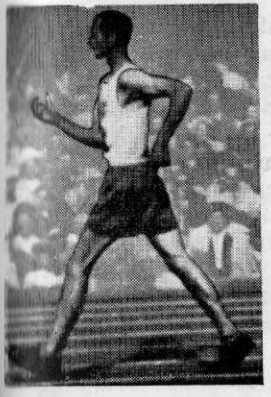

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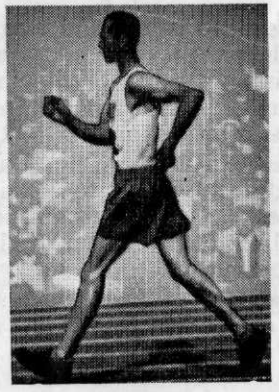

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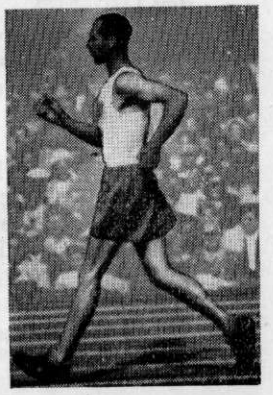


15

4. Training.

(*a*) Walking Distances and a Classification

Distances over which racing is organised vary from 1 mile to 100 miles and, through this wide variance, it is usual for walkers to specialise to some degree. Some may keep within the scope of 1 to 7 miles, others may go on to 20 miles. The longer group may start at 7 miles and go on to 50 miles or more so that it will be seen that the specialisation is rather elastic.

For schools the distance of 1 mile on the track and 3 miles on the road is favoured while the attraction of the 100 miles is largely based upon the qualification to become a member of the "Centurians" club, which demands that applicants must have walked, in competition, 100 miles within the time of 24 hours. These long events are not advocated for the young as their main test is endurance at speeds in the region of 4 to 5 miles an hour, a speed that is equivalent to that of the walker on "strolling" exercise. (See page 47.)

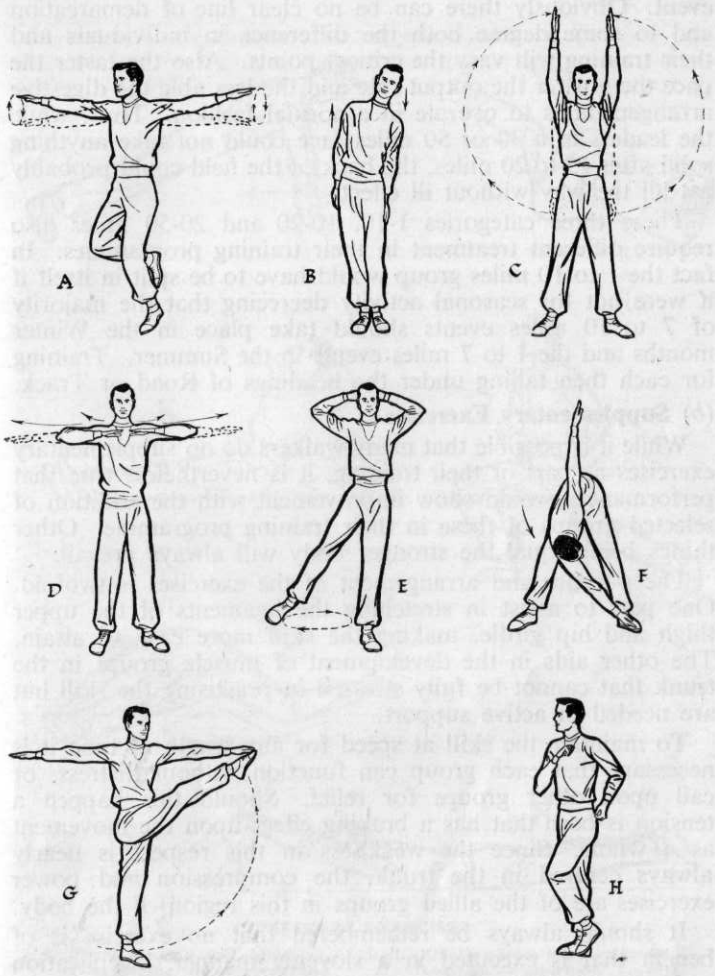
For the sake of usage we need only be concerned with distances 1 to 50 miles divided into three categories. One to 10 miles becoming sprint events, 10 to 20 miles middle distance and 20 to 50 miles long distance. The reasons for these particular separations being that they are roughly the sub-divisions of energy output rates for walkers.

Races of the 1 to 10 miles variety are of the free expenditure type, in which the energy consumed is already stored in the body and the violence of the exercise precludes the digestive organs from functioning to produce more. (Since the digestion can be upset by the effort attention must be given to food taken prior to the event and will be dealt with under diet.)

The second division 10 to 20 miles includes a point, round about 15 miles, where the sprinter's supremacy seems to end and the middle distance walker takes over. Because of this equalising factor some very interesting races have taken place over 15 miles or its metric equivalent of 25 km.

Generally in this division the energy rate is slightly lower thus allowing the digestive organs to function for a time; long enough for the energy of a meal taken some hours before to be absorbed and later used, but not to allow the first stages of digestion to take place.

Finally the long distance category in which food can be taken, turned into energy, and the process repeated during the



RHYTHMIC EXERCISES

A. Running on the spot with hands circling (commencing ex.).
B. Trunk sideways bending, giving lung isolation (inhale at full compression—exhale at change position).
C. Deep breathing with arms outward raising. (Recovery ex.).
D. Shoulders backward pressing alternate with arms flinging.
E. Alternate leg circling (balancing ex.).
F. Low position trunk swinging (Alternate with D. and G.)
G. High kicking with upright trunk.
H. Walking on the spot using forward hip thrust.

event. Obviously there can be no clear line of demarcation and to some degree both the difference in individuals and their training will vary the critical points. Also the faster the pace the greater the output rate and the less able the digestive arrangement is to operate in a normal fashion. Thus, while the leaders in a 30 or 50 miles race could not take anything solid after 15 to 20 miles, the back of the field could probably eat all the way without ill effect.

These three categories 1-10, 10-20 and 20-50 miles also require different treatment in their training programmes. In fact the 1 to 10 miles group would have to be split in itself if it were not for seasonal activity decreeing that the majority of 7 to 10 miles events should take place in the Winter months and the 1 to 7 miles events in the Summer. Training for each then falling under the headings of Road or Track.

(*b*) Supplementary Exercises

While it is possible that many walkers do no supplementary exercises as part of their training, it is nevertheless true that performances would show improvement with the addition of selected groups of these in their training programme. Other things being equal the stronger body will always prevail.

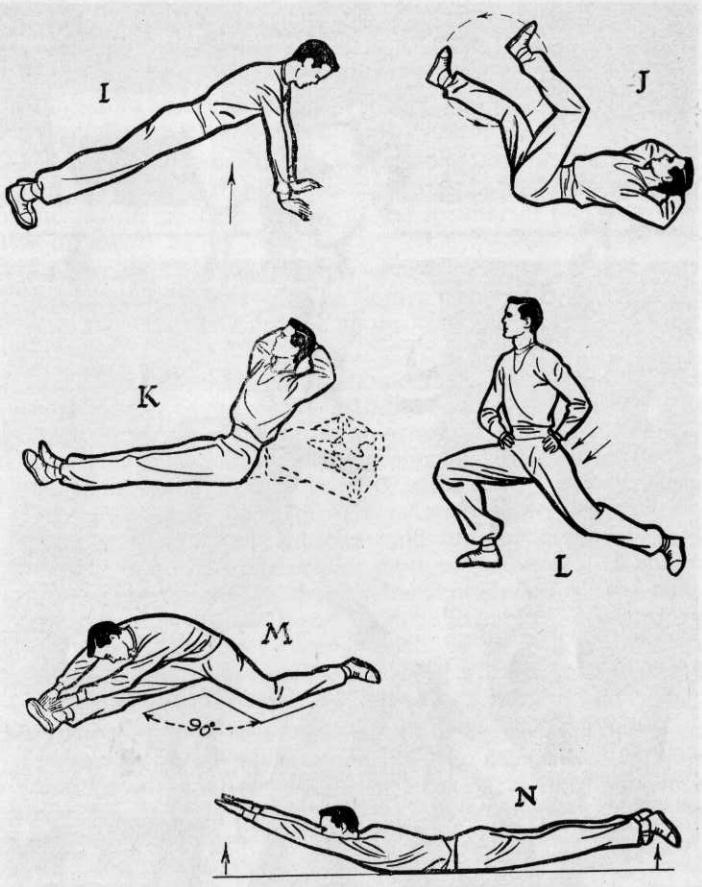
The purpose and arrangement of the exercises is twofold. One part to assist in stretching the ligaments of the upper thigh and hip girdle, making the skill more easy to attain. The other aids in the development of muscle groups in the trunk that cannot be fully stressed in practising the skill but are needed in active support.

To maintain the skill at speed for any length of time it is necessary that each group can function without distress, or call upon other groups for relief. Should this happen a tension is born that has a braking effect upon the movement as a whole. Since the weakness in this respect is nearly always centred in the trunk, the compression and power exercises are of the allied groups in this region of the body.

It should always be remembered that no exercise is of benefit that is executed in a slovenly manner. Application and concentration are important to get the desired results.

Always start the session, as you would other training, by leading up to the more difficult exercise with those of a rhythmic nature and intermix the pressure exercises with spells of stretching.

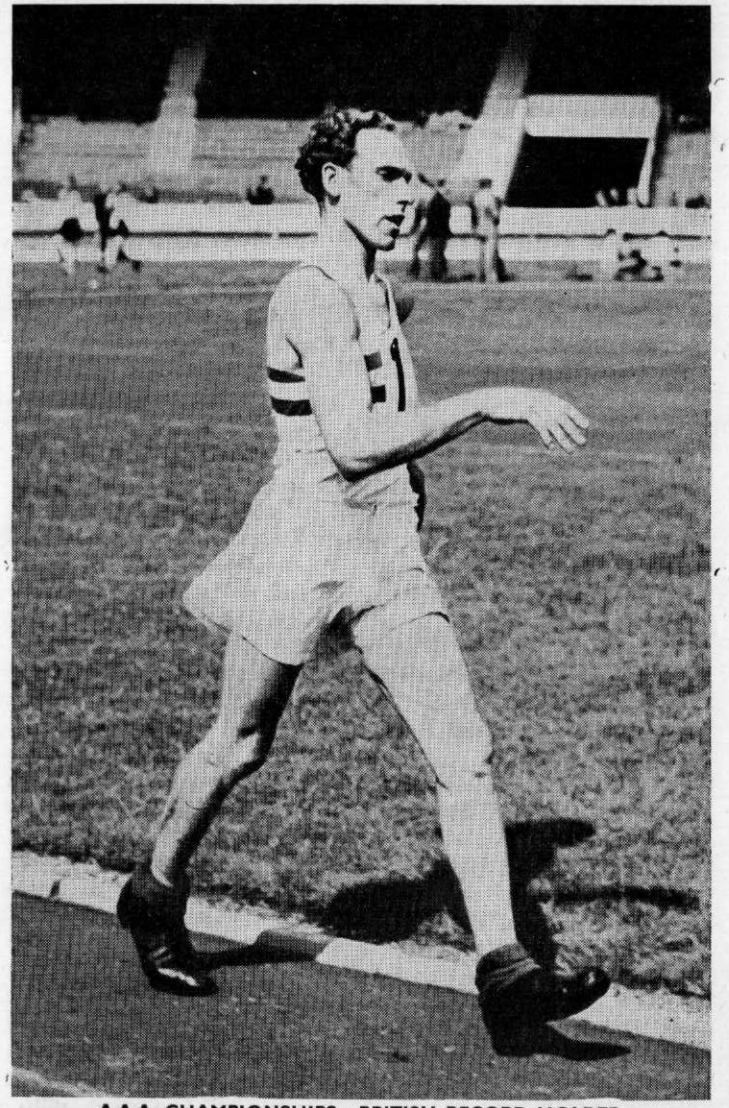
The suggested exercises on pages 35 and 37 should occupy a period of 45 minutes and if shorter time is to be devoted then



PRESSURE EXERCISES

I. Trunk raising and lowering. (Developing upper arms and trunk.)
J. Cycling in the air with feet at 45 degrees. (Abdominals.)
K. Trunk raising from the supine position. (Abdominals and dorsals.)
L. Starting from the feet astride position — alternate lunging with hip forward press.
M. Take up alternate leg position and press trunk firmly to thigh.
N. Hands and feet alternate and together raising. (Dorsals.)

a selection should be made because although it is not advocated that any exercise must be carried to its endurance limit, enough should be done to make it really felt and in some cases repeated after a rest.



A.A.A. CHAMPIONSHIPS. BRITISH RECORD HOLDER ROLAND HARDY at speed. Here he is using a forward action of the arms to smooth out the jogging that had previously made his walking suspect by the judges. This was prescribed as a remedial exercise and he has now lost his fault, while retaining his speed.

(*c*) Weight Training

There is a growing tendency among athletes generally to use light weights in exercise as part of their training, with the object in mind of building greater volume of muscle to increase the power and speed of movement at their disposal.

Mr. Oscar State has drawn up the following list for walkers and he says that, strange as it may seem, walkers have some of the requirements necessary to the sprinter in their leg and arm drives.

1. *Limbering up.* This should consist of a few minutes of free-standing exercises so as to give the body a preliminary warming up prior to the more vigorous weight training exercise.
2. *Neck and Shoulder* with shoulders rolling upwards and backwards. Stand easily astride, holding a dumb-bell in each hand hanging down at arm's length by the sides, knuckles turned outwards. Keeping the arms straight, raise the shoulders as high as possible, then roll them backwards and downwards. The movement must be confined to the neck and shoulder muscles and should be performed briskly in a non-stop circular motion. In between each set of repetitions shake and relax the shoulders.
   Weight of each dumb-bell 25 lb. The repetitions remain fixed at three sets of 10 and weight of each dumb-bell can be increased when capable of coping without losing correct form or requisite speed.
3. *Arms—Alternate Curling.* Stand astride and lean the trunk forward slightly. Hold a dumb-bell in each hand with the thumbs to the front, bend the right arm and bring the dumb-bell to the shoulder. As it is lowered again, bring up the other arm and then begin "curling" alternately. The arm that is being lowered should be fully straightened and forced backwards as far as possible. The work should be done in a fast rhythm and for this reason the dumb-bells should be at a fairly low poundage.
   Weight of each dumb-bell 10 lb. For the first month perform three sets of eight repetitions and add one each week until three sets of 10 repetitions are reached. After this add $2\frac{1}{2}$ lb. to each dumb-bell monthly, but only when capable of maintaining the speed. No increase should be made beyond 25 lb.
4. *Abdominals—Lying back and knees raising.* Lie on the back, with the hands grasping a fixed heavy object behind

the head. A weight should be fixed to the feet—either "iron boots" or a dumb-bell strapped on. Raise the knees as high as possible on to the chest with a quick snap-up. Without pausing, stretch the legs quickly forwards, then lower them slowly to the ground. Total weight on the feet 10 lb. Start for the first month with 2 sets of 10 repetitions. Then add gradually, as you feel capable of it, one or two repetitions until you are doing 2 sets of 15 repetitions, after which add 5 lb. and revert to 2 sets of 10. Because of the strenuous nature of this exercise 2 sets of 15 repeats will be about all that can be expected.

5. *Legs—Deep knees bending.* Stand short astride, with a barbell supported across the shoulders behind the neck. A pad or towel will make it less uncomfortable. Rise on the toes, then bend the knees as deeply as possible, keeping the head up and back straight. Rebound immediately from low, knees-bend position by straightening the legs as quickly and as vigorously as possible. Continue bending and stretching in a fast rhythm. Guard against rounding the back and bending the shoulders forwards, particularly during the return movement. If it is found difficult to keep on the toes all the time, rest the heels on two blocks of wood or two large weight discs. (Weight of barbell 50 lb.) For the first month do 2 sets of 10 repetitions. After that work up to 3 sets of 10 by adding two each week. Then increase the weight by 10 lb. and do 3 sets of 8 repetitions working up again to 10. From then on keep to 3 sets of 10 increasing the weight by 10 lb. whenever it is felt that the exercise is becoming too easy, but never sacrifice the speed of movement.
6. *Chest—Straight arm pulling over on a bench.* Lie on the back on a low bench. With arms straight and palms upwards, grasp a barbell behind the head, hands shoulder width apart. Pull the bar, with straight arms, to a position directly above the face and lower again steadily, to the floor. Lower the bar slowly while breathing in and pull over quickly while breathing out. This exercise is best following the deep-knees bend and alternate with it, because it is more effective whilst still slightly breathless. (Weight of barbell 20 lb.) The repetitions are fixed at 3 sets of 10. Because this exercise is mainly a chest mobiliser and "depletive" for restoring normal breathing after deep-knees bend, there is no need to progress to heavy weights.

7. *Hips and Legs.* Alternate splitting. Stand with a barbell supported across the shoulders behind the neck, padded up as in exercise 5 to prevent it bumping on the neck. The footwork alternates with right leg forwards—left leg back, and vice versa. Jump and "split the feet", one going backwards on the toes and the other forwards in a lunging movement, landing on a flat foot with the knee bent forming a right angle. Jump again and reverse the feet. Continue in as fast a rhythm as possible for 10 repetitions, making each landing as springy and relaxed as possible. (Weight of barbell 30 lb.) The repetitions are fixed at 3 sets of 10 and with this lightish weight there is no need to put the barbell down between sets. Just take a few breaths and shake the legs for rest. Again add more weight whenever capable without sacrificing speed.

(*d*) Sprint Walking and Training

Although under this we have included all walking distances up to 10 miles, we will first talk about track walking and, for the benefit of the young athlete, the 1 mile in particular.

As with all walking, the hardest task is to open up or close a gap during competition without running the risk of disqualification or reckless use of energy. It is therefore better never to lose contact with the field, within the bounds of reason, or else to entirely ignore them. If the latter course is chosen the task becomes one of producing a high average speed that will prove effective before the full course is covered. That means no shock tactics, but attrition, in disposing of the opposition.

Accurate judgement of pace therefore becomes an essential part of the walker's training. In track sessions you become aware that maximum speed can be used only for distances up to 300 yards and that some reduction will be necessary if a mile has to be covered. The question then posed is the merit of even laps against some other combination.

Theoretically the best results against the clock are to be obtained by even laps and with this as the object, the rest of the field can be ignored.

In match racing, however, where the object is just to win, the tactics used may not produce the best time although disposing of otherwise superior opposition. This assessment has to be made according to existing knowledge. A psychological advantage may be gained by a fast initial lap or

sustained rallies; enough to win but to the detriment of the final time and accurate judgement of energy output is here even more necessary to ensure that the tables are not turned eventually by a weak finish.

Passing on bends is not generally advocated but it would be better to walk at half shoulder all round a bend, if by doing so you are enabled to press home an advantage. It is certainly better to do this than allow the walker in front to dictate the pace if it affects the natural length of stride and consequential balance. These situations are best judged as they arise and taken in the light of the more general plan.

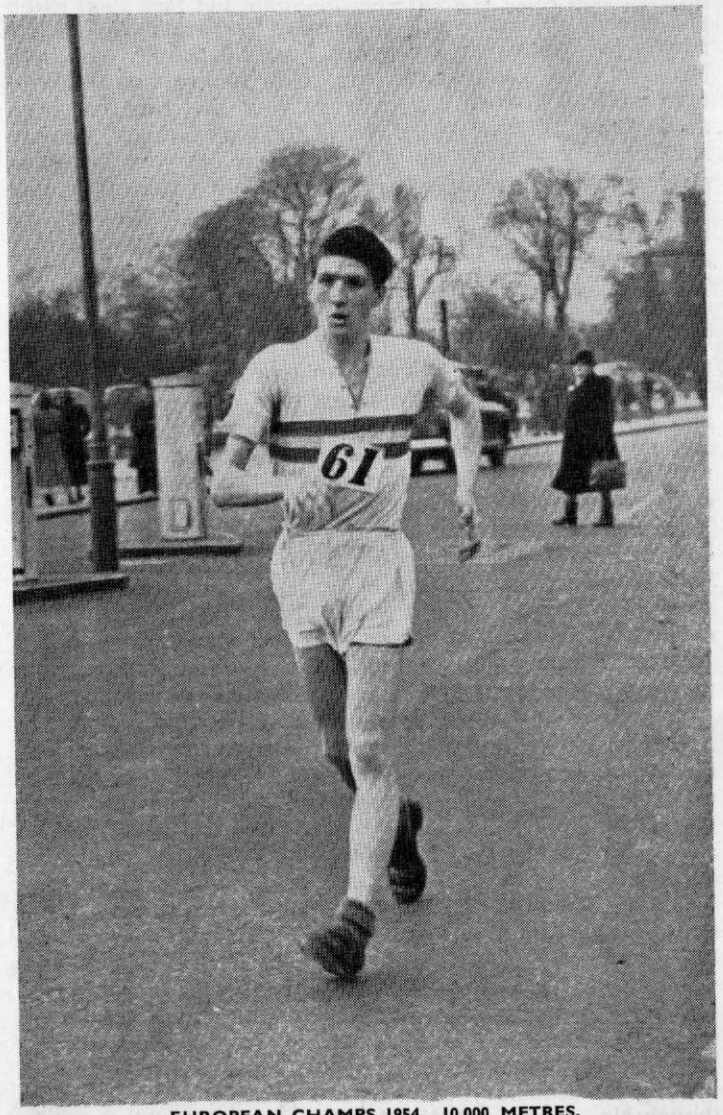
Always spread the effort out and don't save a large helping of energy for the finish. In the first place it is perfectly obvious that it could have been much more effective elsewhere and secondly there is always the danger of over excitement causing a "lift" and disqualification by a walking judge.

To pinpoint some of the situations that may arise in the course of competition we will put you in *a typical* 1 *mile* and see what can happen to you and other competitors.

You are No. 5 in a field of 10 competitors and at the moment you are drawn behind the starting line, having been assembled by the competitors' steward—in the draw for position you get placed third from the outside. Whilst waiting for the Starter's orders your thoughts range over a number of things. The foremost, as you take a few deep breaths, can you win today, although your best time is some 7 sec. worse than No. 1 and about the same as No. 3. You hope that your warming up has been enough and you anticipate that the winning time will be between 6 min. 58 sec. to 7.05. A little nervous shiver as you debate the merits of hanging on to the leader but decide to walk a moderate first lap and plan from there. You begin to wish the race would start and then—"To your marks! Set! —and you are off at last with only one thought left—to get a good position before the first bend—everyone seems to have the same idea and your better sense leads to a compromise as you realise that, at that pace, the first lap will be far too fast.

Your thoughts are clear and your nervousness has disappeared as you size up the opposition on the bend and the "field" falls into shape.

No. 1, as expected, has taken the lead with Nos. 3 and 7 close behind. You are half shoulder out in about 8th position



EUROPEAN CHAMPS 1954. 10,000 METRES.
Fast walking by BRYAN HAWKINS. Tip of toe-tip of heel in contact. The shoulders are doing rather more work and the inturning of the forward foot prevents full use being made of the power from the largest toe joint as the weight is transferred.

and already some 10 yards in arrears. You watch the leaders as you pass your man seeing No. 7, of all people, pass both No. 3 and No. 1 to take the lead. How foolish, you think, to take the lead at such a pace when your best time has been about 7 min. 20 sec. At the end of the back straight, you are still behind a small group of three in line but your breathing is deep and even, while a feeling of relaxation from the initial effort is manifest. The pace feels about right and yet the leader, No. 7, is still piling it on, closely followed by No. 1 as they pass the end of the lap, some 20 yards in front of No. 3. You are a further 20 yards in arrears as you pass the post in the time of 1 min. 43 sec. That means that the leaders must have passed in 1.35—certainly too fast for No. 7 and doubtful if even No. 1 can hold that sort of pace.

Down the back straight you pass two of the group in front and are concentrating on getting maximum stride with a fluid and relaxed action. Meanwhile the leaders are still pushing the pace hard to complete the second lap and as they do No. 1 challenges to retake the lead.

At the half-way stage you are in 5th position and some 60 yards behind but are consoled by the thought that with your time of 3 min. 28 sec., the leaders must have done their second lap in 1.40. Also it would appear that No. 7 has had enough because he is dropping back fast, having been passed by No. 3 now, and you virtually rule him out of your reckoning, wondering at the same time why he made the pace so fast, knowing full well it could not be maintained.

Number 4, the last of the group in front, has slowed and, on the back straight, you pass—feeling good now as you close up on No. 7 and go by without challenge upon entering the bend.

Ten yards away No. 3 is still walking strongly and No. 1, although still on his own is noticeably slowing. Yes, it is now no more than 50 yards; those first two laps are now taking their toll and you are grateful to No. 7 for thus making your task easier.

The "bell" now and you are feeling good as you pass, thinking, this can be my race. The time no longer matters as it will not influence the result and it is personal challenge that becomes the important factor. While concentrating on over-hauling the leaders you assess the position which looks as though No. 3 will catch No. 1 before you catch either and he does this on entering the back straight of the final lap. A tussle develops between them as you make every effort to cut

down their lead but upon entering the last bend they are still together eight yards in front. Just after No. 1 cracks and you too pass him easily trying to overhaul your last competitor.

This is no easy matter for No. 3 can sense victory also, making you put in a sustained effort to make up ground. Sixty yards to go with three yards to make up. You suddenly feel fatigued, you are breathing harshly and your legs weak and rubbery round the knees. With 40 yards to go you still require two yards to get on terms. At 30 yards only one yard and there you seem fixed as your opponent makes his last effort to hold you off. If only you could make one good lunge it would be enough, or let the rear leg break earlier to get a little spring. The discipline of regular speed training takes over; so far and no farther or you will be breaking contact. All you can hope for is that he will not be able to sustain the full effort. Even that is denied as he keeps his small margin through the tape and you are second in 7 min. 0 sec., your best time.

And then, grateful that the effort is over, you walk across to congratulate the winner and, at the same time, wonder where you might have made that vital two yards. Later, if you are wise, you will analyse all the various performances to learn all you can for future use.

Now to your training.

(*e*) 1 to 7 Miles Track Training

First and foremost, since the skill is of great importance, it follows that a fair proportion of training time should be devoted to the exercise and improvement of that skill. No training session should be completed without a period of introspection into the manner in which the fundamentals are being executed, and an observer should be used to ensure that the "contact" is good. After a time it may be possible to dispense with this aid, relying upon your own judgement as most walkers can tell when nearing the danger point. This of course does not always apply to a basic fault which it is the duty of the coach to point out and rectify.

The best time to do this part of the training is during the warming up period and as part of it. The other parts consisting of general loosening and stretching to prepare the limbs for later extensive exercise and speed circulation of the blood stream.

The skill, technique or style training is a co-ordination exercise, bringing the nervous system into action for precise

actuation of the muscle groups. The rhythm at first is slow, but after a few laps is quickened and punctuated with bursts of speed walking for 30 to 40 yards.

The next two parts of training are to increase the speed at present under command and then extend the duration. The former entails an increase in muscle size to provide power by which the weight may be moved more quickly and the latter by toning up the blood replenishment system to cleanse and recharge those muscles under stress.

Both parts can be obtained by repetitive exercise. The use of speed or maximum power from the motive muscles, will build them up into stronger units, and duration, through the vascular load, will exercise the circulatory system of the heart, lungs and veins resulting in stamina. It would be well not to confuse strength with stamina, as strength is the capacity to carry load and stamina is the equation produced by adding time and speed.

These points must be borne in mind according to the distance envisaged, and some compromise in the track training arranged accordingly. Thus for events of 1 to 2 miles the emphasis in the session will be on lap speed with fast and slow laps, or 300 yards bursts and an occasional 3 miles at medium pace, while the 7 miles events will require more work at 4 or 5 miles carried through at the pace of a 7 miles race.

Skill, speed and stamina are the aims, and judicious application of these three parts into a training programme must always be largely an individual matter and the province of the coach with whom the athlete is in regular personal contact. As the right combination, and amount of work to suit the physique and mental capacity of the individual is found, a confidence will be born bringing success in competition.

It may be noticed that no reference to trials over the distance has been made and the reason is psychological in relation to the promotion of confidence. Athletics is primarily a contest between people and as such should stimulate to increased effort and better performance in competition than when set solely against a watch. The danger in trials is that the inferior time will defeat the main object, confidence in the ability to surpass a previous effort. It is far better therefore to use the watch to point the way to a successful course and leave the rest to creative imagination and natural exuberance common in most athletes.

No matter how good a coach may be on theory, he has failed if he has not enthused and bred confidence into his

pupil, more especially a confidence that sustains when the coach is no longer present.

A Few Do's and Don'ts

Always warm up for 20 minutes or so before attempting any speed work, followed by some loosening exercises.

Unless under the watch think of other track users and keep out of the inner lanes.

Always keep warm by replacing your track suit after each effort and KEEP MOVING!

Limber down for a short while at the conclusion of the session. It is sometimes good to shack or trot a lap or two.

Do not hang around when your work is completed but GET DRESSED.

(*f*) Strolling for Sprinters

A basic part of training for all distances is what walkers term "strolling" and runners a sharp walk. Often neglected by the track walker, this strolling at between 4 and 5 miles an hour and sometimes up to 6 miles an hour, can materially help in consolidating the hip technique and, with increased circulation, help to rid the body tissues of waste products.

The extent to which it is practised must be controlled according to the racing distance. A guide in terms of time for the sprint walker would be up to one hour for distances of 1 mile, and up to 3 hours for 7 or 10 miles events. Increasing these times may work adversely on the speed while building up unwanted stamina. The shorter the time devoted, the faster the stroll should be, within the limits laid down, and the amount of clothing worn should be such that, although comfortably warm, excessive perspiration is avoided.

(*g*) Training Periods

The number of sessions a week and their duration will need consideration, and here the capacity of the athlete will have to be taken into account. Latent strength, mental reaction to training and stimulus, recovery rate from effort, all will have bearing upon the desired optimum. Experience proves, however, that not less than three training outings a week are necessary, and if five are used then they should be of comparatively short duration if zest and progressive accomplishment are to result.

Five Session Schedule for 1-2 Miles

Monday. Warm up 20 minutes with style practice (track bottoms off for latter). Stretching exercises. Continuous 8 laps with speed walking on each straight. Slow, restful walking for 10 minutes. Four laps fast and slow alternately. Easy 1 mile and limber down.

Tuesday. Warm up 20 minutes with style practice. Slow walking for 10 minutes. Six laps walking fast alternate 220 yards. Slow walking for 10 minutes followed by 1 mile at progressive speed. Limber down.

Wednesday. Strolling for about 1 hour (about 5 miles not included as a session).

Thursday. Warm up and without resting carry on to do 3 steady miles.

Friday. When racing on Saturday, warm up 20 minutes with style practice. One mile, using speed walking on the straights. Limber down. When not racing, add fast 880 yards, spaced by 10 minutes slow walking.

Saturday. Racing or Rest.

Sunday. After racing: 1 to 2 hours strolling (5 to 9 miles). After resting: After progressive warming up then, either 5 miles steady paced or 2 miles with progressive speed up to 5th lap and hold for last three. Limber down and jog to rest.

Four Session Schedule for 7 Miles

Monday. Warm up for 20 minutes with style practice. Stretching exercises. Continuous 8 laps with speed walking, alternate 220 yards. Slow walking for 10 minutes followed by 1 mile at 7 miles pace. Limber down.

Tuesday. Warm up, followed by 5 miles at even lap speed near to maximum for the distance. Limber down.

Wednesday. Rest or 2 hours strolling (not included).

Thursday. Warm up, followed by 6 or 7 miles of steady walking punctuated by speed walking on each straight. (If racing Saturday cut by half.)

Friday. Rest.

Saturday. Racing or rest.

Sunday. After racing: 2 to 3 hours strolling (9 to 13 miles). After rest: 8 to 10 miles easy paced walking.

Note: Supplementary sessions of exercise can be inserted at any time convenient to the athlete and especially on those days when little work is otherwise undertaken.

(*h*) Training for Road Events

Up to 10 Miles

By virtue of the fact that competition in road events up to 10 miles is mainly a winter occupation little track work is done, and indeed a rather different system is adopted centring around club activity. The system referred to is that of pack training, wherein the walkers are graded roughly according to ability, and are sent out over a stated course at intervals of time, starting with the slowest group.

The object is twofold inasmuch as it encourages the inferior walker to a better performance and at the same time seeks to guard against racing in training.

To obtain the best result, it is the duty of the captain to set such intervals that each pack is in turn overtaken, giving opportunities to the slower men to do some of their work with the better grade. Ideally used, the fast pack will not press on past the slower but will take them along for periods, even retracing their steps at times to give a breather before rejoining the group.

This, while giving all some fast and slow work, promotes a firm bond calculated to breed that indefinable "club spirit". It is usual to walk the full distance of the race under review, with the fast men doing a shade more on the main training day, and slightly less for all during the mid-week spins. Two or three outings a week are needed for serious racing and in addition two strolls of from 2 to 3 hours duration at between 4 and 5 miles an hour.

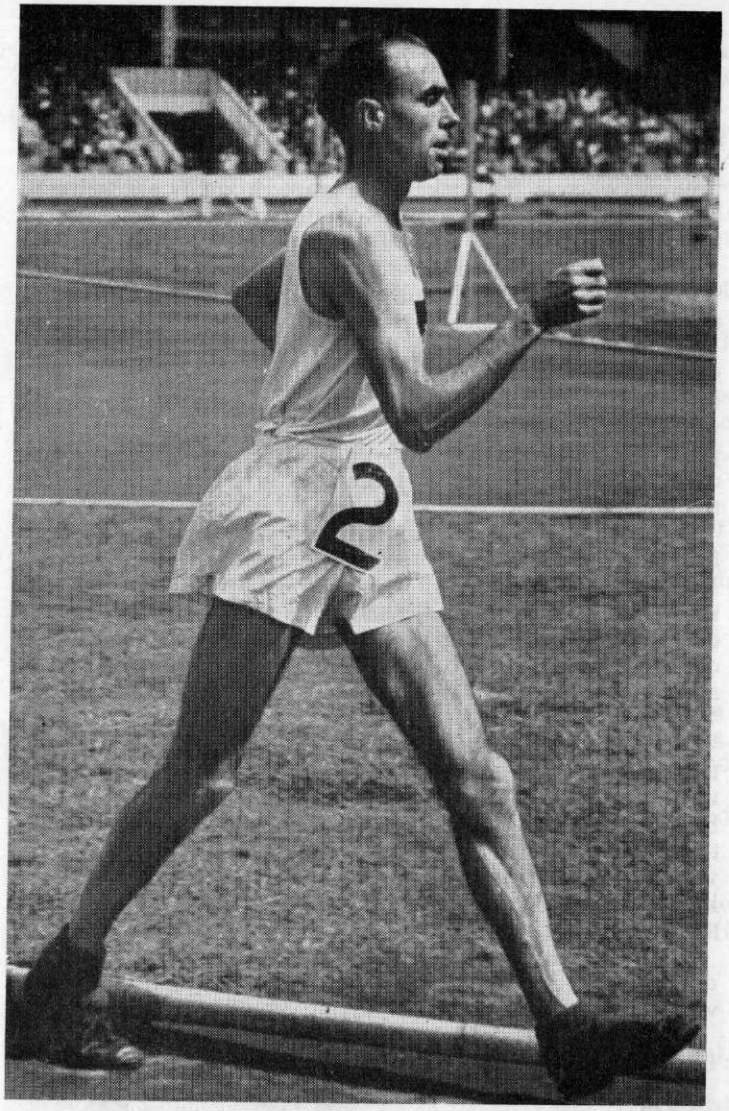
In the races the average speed throughout is little slower than that for 2 miles and although speed training is an asset up to 7 miles, for the other 3 miles stamina counts and will be found a distinct advantage when coping with the gradients that are inseparable from road events. On these of the uphill variety, a shorter stride in front of the body, landing on a bent knee with subsequent drive from the rear leg, will materially assist.

On the down grades a full forward stride with hip reaching down, coupled with low arm action that has a strong return, will keep the walker out of judging troubles.

It is during these winter months that building up can usefully be done by means of regular supplementary exercises.

15 Miles

As stated earlier this distance seems to mark the end of the sprinters' predominance and the probable answer is that



1948 OLYMPIC 10,000 METRES
C. J. MORRIS. A good full stride action of a tall walker using high arm carriage to compensate the leg thrust.

not enough attention is paid by them to general strengthening walks. Economy of effort and the chemistry of the body may also have some bearing on the result of some cases.

From the economy point of view a slightly shorter stride that cuts down the recovery effort can help, while greater attention to pre-race feeding is in itself quite an important factor.

The stamina angle is, however, one of basic training. Too often training is confined to 10 miles when at least one outing a week should, for some 6 or 8 weeks prior, have been stepped up to 12 or 13 miles, besides the mid-week 6 to 7 miles spins.

For the serious 15-miler this in itself is not enough as the ability to sustain duration demands that work should be piled on work to accustom the body to further effort. For want of a better term we will call this process "lamination" of effort, whereby more work is undertaken before recovery is complete from a previous session. In its relation to a 15 miles race it would entail a training spin of 10 miles being repeated the next day and followed by at least a two-hour stroll on the third.

Alternatively, a 13 miles spin could be followed by a four-hour stroll at 5 miles an hour and another 2 hours on the third day. One mid-week spin (a fast 6 miles) and one 2 hours stroll in addition would be sufficient for the week's work.

If the 15 miles should be on the track, do part of the training under track conditions, preferably the shorter spin to obviate the monotony of the longer journey.

No food should be taken during the event. A light meal taken some two hours before and a booster of glucose or pure honey about 15 minutes before the start should be enough. The last drink should precede the last meal, and not after, to prevent stomach upsets, and it would be as well to check the reactions to glucose and honey during training.

20 Miles

Here the training will take much the same pattern as that for 15 miles with the exception that the long spin will be extended two or three miles and the single mid-week spin altered to two short, fast spins. At this stage of distance, training begins to take up much time, as the accent is on walking on every conceivable occasion.

Experimentation becomes necessary on suitable foods and drink to be taken during the race, where feeding is allowed after the first 7 miles have been covered. A fit athlete, on a cool day, should require nothing at this distance, but we are not always fit and we cannot make the weather to suit, so that it is best to be prepared.

50 Kilometres and 50 Miles

These events are usually confined to the summer months ranging from June to September, but the preparation must be spread over several months to get a progressive build up and, indeed, probably three years would be nearer the time necessary to attain a peak with a sufficiency of experience as a background.

It is, in its sphere, as specialised as fast track walking, and to excel requires that any high degree of nervous energy output should be confined to this period and not spread over all distances throughout the year. Also, to continue year after year requires a period of relaxation or "going to grass" for two or three months. With the English season this can well take place after September, with training off to December, when the general activities can be joined without serious application to the racing side.

(*i*) General Conditioning

Since the events may take anything from 4½ hours for 50 kilometres to 8 hours or more for the longer walk, according to the ability of the individual, it is obvious that those organs which convert food into energy and those that store that energy will be called upon to play an important part, for the natural storage system of the body would not be sufficient for more than part of the distance.

It is computed that the energy rate used at 7 miles an hour is in the region of 1,000 calories or a total of 4,500 for 50 kilometres at this speed. The approximate storage capacity of the liver with the addition of a meal in process of digestion only totals 3,500, so that the balance has to be made up by either loss of muscle glycogen or additional intake en route. For these reasons conditioning of the digestive tract and liver storage must figure in the training schedule.

This is best established, as with the muscular system, by exercise of that particular department under progressively similar conditions, by taking in the food, turning it into energy through the digestive process, and finally having to

call upon that energy during the training effort. Care, of course, has to be observed to ensure that the pace used is controlled to such a degree that it allows sufficient diversion of blood to the digestive organs, and for this reason the work is comparatively light but of long duration.

Strolling over the country is the best medium that can be employed for this purpose, as it is for strengthening the muscle sheaths and ligaments, while at the same time giving mental relaxation from what might otherwise be irksome training.

No fixed speed should be laid down, but the walker capable of 7 miles in the hour should be able to sustain a strolling speed of 5 miles an hour, with a duration of from 3 to 8 hours according to the programme of training at that time.

At a stage leading to these longer strolls, especially during the winter months when it is difficult to retain body heat, shorter ones of up to 3 hours will prepare the way and then the speed will be controlled by the need to keep comfortably warm without recourse to heavy clothing. At no time should an exercise be continued when body heat cannot be maintained.

During all these strolls practise the art of muscular relaxation. By this I do not mean slouching with the arms dangling, but within the scope of its use, see that each group relaxes for as great a period as possible, remembering that only in relaxation can the muscles be cleansed efficiently of waste products generated by the exercise. A habit thus developed will remain when the mind is later engrossed in racing activity.

Breathing control can also be practised on these strolls to encourage the full employment of the lungs. One such method is to sing or recite phrases that, in conjunction with the exercise space the periods of inhalation and so place a load on the respiratory system. There must be many others, although I do not recommend deep breathing in itself.

Experimentation can be made with types of easily digestible food to find that which will best suit, and later this can be further tried on a duration training spin to test its reaction at speeds when the stomach is under greater stress due to less favoured blood supply.

Whether the distance of the race be 50 kilometres or 50 miles it is doubtful if anything of a solid nature can be digested after about 25 miles have been covered, and to the ignoring of this fact can be attributed many stomach cramps and violent stitches.

Fluid should be kept to a minimum and taken only in small quantities with the addition of saline (see diet notes), to offset the possibility of muscle cramp. Unless heat is exceptional no great quantity should be required and since under championship conditions attendance is restricted it is well to train to these where possible.

(*ii*) Training Spins and Duration

Distance races of 50 kilometres upward usually follow progressively after 10, 15 and 20 miles races and it is therefore safe to assume that the walker has thus built up to this point and at the same time laid a foundation for longer work by additional strolling. It is best, at this time, to plan the racing programme from the events on the calendar, trying to space the objective races with sufficient recovery time in between. The ideal to aim at is about every four weeks, giving 4 or 5 peak efforts between the months of June and September. This spacing gives time for mental as well as physical recovery which can be quite an important factor where the duration of the races can be spread over 8 hours.

Because of this mental or nervous strain it is as well to keep the distance training down to a reasonable limit, and in practice I have found that, mixed with racing, spins of 20 miles are sufficient with the pace the same as that to be used in the competition.

Coupled with these long spins some work is required to retain a fair margin of speed, not so much for use in the race where necessary, but more to increase the economic cruising speed. The tendency of much distance work is to produce sluggish movement and a fair quantity of these short, fast spins are required to offset this by keeping "life" in the muscles. Spins of up to 5 miles on the track are ideal for this purpose.

After warming up, a lap speed comparable to that of a 7 miles race should be set and if any falling away, of any consequence, in these times should appear after 3 miles have been covered, then finish at once the work for that day and repeat 2 days later. If lap times are difficult to attain due to stiffness resultant from strolling, etc., then confine the session to a long warm up with little speed work.

The watch, which will be used, should be kept as a guide and never as an opponent in training. This is all the more important on the longer spins when the effort has to be

even over the total distance with satisfaction and confidence as the aims.

(*iii*) Mental Approach and Amount of Work

The foregoing training outline has set an approach to the problem with suggestions regarding method, but it is far more difficult to merge them into a rigid training schedule. In this the physique and mental reaction of the athlete has to be considered. It is not the slightest use saying do this or that in an unrelenting schedule where the physique is not suited, and it would also defeat its object if it produced a fit body robbed of all self-confidence—a condition akin to staleness.

The highly-strung athlete or one with a slight physique will require a schedule bristling with inspiration, while the more phlegmatic type will probably thrive on plenty of hard repetitive work.

In whatever class the athlete falls a regular watch on body weight can be a fair indication and guide to requirements, and any progressive drop should be corrected by a lightening of the work.

Training, in the sense of effort, should finish four or five days prior to the event, allowing a mental rest and stimulation for the competition to come,

In events over 15 miles, the first mile or two can be most usefully employed in obtaining easy, fluid, movement, gradually merging into a racing stride that is not influenced by that of other competitors. These you should be aware of, but not subversive to, if the best result is to be obtained from your training background. The course is the main objective, and such races are invariably won as time trials and rarely as dog fights by the participants.

5. General Training Aids

(*a*) Diet

Providing that the athlete is not addicted to heavily spiced or seasoned food no dieting is necessary. He will obviously, due to his expenditure of energy, require a good intake of wholesome food, and this should be taken at regular times.

Care is necessary on the day prior and on the race day itself because, as mentioned earlier, the stomach is under stress during the event. This caution will also apply to training on those occasions when it approaches racing conditions.

On these days nothing fried is a wise precaution, while

citrus fruit is best avoided, although the juice, well sugared, can be admitted. All fats, with the exception of butter, should be excluded.

A general guide as to what to eat on these occasions is the stage of digestion in which they are assimilated. All those foods that are digested in the stomach are admissible. These include stale bread, cereals, lean meat, lean ham, lightly boiled eggs, boiled liver, white fish, sugar and honey with butter fat. A small amount of creamed potatoes can also be taken.

Foods to be avoided that are normally part of a balanced diet are root vegetables, green vegetables, meat fats, fruit, cheese (except the cream variety) and new bread.

It is also best to take fluids at least half an hour before the last meal.

An Experiment on Feeding Prior to Effort

Object. How much actual energy value is contained in the pre-race meal was the quest in this four-stage experiment and what would result by taking just pure energy food such as honey or glucose in its place.

General. It was thought that, to obtain a decision of any value, the effort should be spread equally over a period of 2 hours.

The lapping speed, after easy rhythm was obtained, would be controlled only to a degree that would ensure completion of the 2 hours without distress or great falling off of lap times.

Observation to be kept on the following:

1. That a fair quota of food was taken on the previous day of a like nature on each occasion.
2. Each effort would be started 3 hours after rising.
3. Each lap time to be recorded and note taken when the optimum lap was reached and when decline started.

Note 1. The input of food on the preceding day consisted of a mid-day meal, bread and butter tea, with drink and biscuit before retiring. This, it was considered, would ensure an empty digestive tract each morning.

Note 2. On all four occasions the weather proved helpful in that so far as humidity, lack of sun, and wind conditions were equal. On the third occasion the temperature was slightly colder. All were in the month of December.

Stage 1. Arise and drink 2 cups of tea with sugar to taste. Three-quarters of an hour later eat breakfast consisting of 1

teacupful of oats cooked in ½ pint water and ½ pint milk with salt.

Work began with progressive laps in place of any warming up until, after 30 minutes, full freedom was felt and a steady lap time attained. This was perfectly regular until 1 hour 15 minutes had passed, then a little effort was required to maintain the even speed.

From then onwards it became increasingly difficult, and at 1 hour 30 minutes the time began to fall away until the 2 hours was reached with an 8 per cent. deterioration.

Stage 2. Arise and drink 2 cups of tea only.

Work began as before with the lap times falling in a similar pattern up to the 32nd minute, when even lapping was reached and maintained up to 1½ hour stage. During the final 30 minutes it again required a definite effort to keep to lap speed but only just over 2 per cent. loss was incurred.

There was no feeling of weakness or hunger, although, as on the first stage, heaviness in the leg muscles was felt from the point at which extra effort was necessary.

Interim Report. Since no ill effect was experienced from the absence of the breakfast it could be assumed that both efforts were accomplished on the energy stored from the food of the previous day, and indeed the slightly better performance without food seemed to indicate that some energy was being used in the digestion.

The fact that on each occasion the motive power began to fail at approximately the same time, e.g. 75 minutes, may signify the period at which supplementation is necessary for that particular output rate of energy. It would also seem that the type of food taken on the first stage was unsuitable for this purpose.

Stage 3. *Using Pure English Honey*. Arise and drink 2 cups of tea with sugar. No other food taken until starting of the work, when 1 dessertspoonful of honey was taken.

Even lapping time was reached in 28 minutes, and at 30 minutes another spoonful of honey was taken and repeated each 30 minutes. The lap times only varied throughout by 1 to 2 secs. and at no time was it found difficult to maintain them. With 8 laps to finish the pace was stepped up some 3 secs. per lap. This resulted in temporary distress through oxygen debt, but was soon corrected by reverting to schedule time for 2 laps.

No discomfort was felt after taking the honey, either in the stomach or mouth, although a little belching occurred

25 minutes after each of the 2nd and 3rd doses.

Stage 4. *Using B.D. Glucose made into a paste.* The pattern was identical to that when using honey, the 2 hours being covered at even speed after 30 minutes. One had the feeling, however, that to continue with the glucose would produce a sense of nausea. This, of course, may have been just a personal reaction to the taste.

Conclusion. It seemed rather obvious that the solid foods taken on the day of a competition that lasts up to 2 hours, were of no material benefit in so far as energy was concerned, and apart from common bodily habit, it would be better to keep to pure energy foods on that day. Certainly any meal within three hours of such competition was quite unnecessary.

(*b*) When to Eat

For walking events of from 1 to 10 miles it is best to be a little hungry at the start so that the last meal will be taken some 3 hours before. Honey or glucose can be taken up to 15 minutes before the start. Nothing during the race is required or allowed.

For the events from 10 to 20 miles, a fair meal about 2 hours before with the addition of honey or glucose. During the race these can be taken at intervals, while for drink either soda water, minerals and tea or coffee are best. The tea or coffee should be hot, even on a hot day, and they can be well sugared, but milk is best excluded to prevent sickness.

On the longer distance events, the last meal can be taken up to one hour before, if the quantity is small. This is because the nature of the exercise allows for digestion to take place. During the event semi-solid food can be taken up to 20-25 miles, according to the distance and corresponding speed. After this, energy must be sustained by honey, glucose or sugar, either taken separately or mixed with the fluids. These are the same as for 20 miles with care being taken not to mix the types. If tea or coffee is taken don't pour lemonade on top or vice versa. The addition of saline to the drink is a wise precaution to obviate the risk of cramp through salt lost in perspiration.

It is also wise to eat in small quantities before the 20 miles point and to take a little fluid before it becomes a necessity. Too often the intake is delayed until weakness occurs and it is then too late to be effective.

(*c*) Saline Drink

This valuable addition to the distance walkers' drink can

be made up in concentrated form and added when desired. It has the benefit of not causing or increasing thirst, even in concentrated form, as would the addition of ordinary salt.

The prescription can be made up in any chemist shop and consists of 6 oz. of Sodium Chloride, 4 oz. Potassium Chloride, which with $1\frac{1}{2}$ pts. of water makes a solution of roughly 25 concentrations. Half a dessertspoonful would be enough for a drink (approximately $\frac{1}{6}$ pt.).

(*d*) Clothing and Heat Regulation

Of the excessive heat generated by the body during exercises some 75 per cent. is dissipated by the sweat glands and the rest in breath vapour.

It is noticeable that in the early stages of exercise the skin remains dry, but as more heat is generated the sweat glands exude moisture to further the process of reducing body temperature. With this moisture are mixed salts and muscle impurities, giving them relief and aiding circulation. The amount of this perspiration will vary with the fitness of the athlete. The unfit, with layers of fat in the skin that retain body heat, will naturally perspire more freely than the fit, but in all cases the pores must be free to operate. The ideal, perhaps, being a moist skin without excess.

The clothing of the athlete for short distance events will probably not unduly inconvenience him as the body will cope anyway to offset his own negligence or mistakes. This applies to the use of strong oils which clutter the pores, when judicious warming up would produce a more efficient result.

On long distance events attention to these details can be an important factor, for excessive perspiration can be weakening and no perspiration injurious. Excess can be controlled by wearing enough, but not too much, light clothing—laminated clothing if it is cold, to prevent condensation on the skin. A cold wind is more readily felt through one thick layer than two thin ones which contain an insulating layer of air between.

The greater danger, perhaps, is to wear too scanty clothing on a very hot day when also exposed to the heat of the sun. It is a very natural thing to cast off clothing under these conditions, but not wise to expose large areas of the skin to the effects of sunburn and thus reduce their thermal efficiency. A light singlet, with a small neck and quarter sleeves, is the best all round guard for the distance walker and, if it becomes possible, a change into a clean, dry one when energy and body heat are falling.

Cold water should be kept off the body and applied to extremities such as hands and head for cooling purposes, and even then the amount kept to the minimum required.

Slips are better than belt supports, which have a habit of chafing, and neither these nor the shorts should in any way grip the waist. Constriction here promotes tension on the abdominal muscles, which in itself is bad, and if continued will promote a condition of "stitch".

Shoes should be light and durable, with rubber heel or tip to minimise jar and, while gripping the instep to prevent forward foot drive should have plenty of room for the toes to spread. Inspection for roughness or ridges will keep blisters away.

Socks that are big enough and of woollen texture are best, and they should be thick enough to absorb perspiration.

(*e*) Care of the Feet

These can be the walker's best friends or his worst enemies according to the way they are treated. It is a mistake to assume that hardening of the skin will prevent blistering, for like the palms of the hands they disperse much heat. The prevention of this by hardened or calloused skin means that irritation is set up between the skin layers and fluid is formed starting the blister.

Frequent washing in cold or tepid water to retain the natural oils, removal of calloused skin by hard towelling and scraping but not cutting, and care of nails, will keep them in condition.

If blisters occur, and no action is necessary during the event, then they are best left until bedtime when they can be emptied and surgical spirit applied. The night's rest without further aggravation will go far towards putting them right.

(*f*) Hot Baths

These are inclined to make the athlete lethargic and are best avoided, especially before a competition. A warm shower, followed by a good towelling, is much better for muscle tone.

(*g*) Sleep

Of course all athletes require a good quota if they are to give of their best. What that is may vary, but it is usually in the region of 8 or 9 hours.

If before competition, a spate of nerves or an over active brain prevents sleep, try to lay relaxed and contented because

it is the rest that is more essential than oblivion. An hour's light stroll will often make sleep easier to acquire.

(*h*) Massage

With the training kept on the lines suggested, massage should be unnecessary, excepting the occasion of injury, when it should be conducted by a qualified masseur.

(*i*) Smoking and Alcohol

The walker who has never partaken is better without; if indulged in, then keep to a minimum.

(*j*) Medical Check-up

It is as well to see your doctor from time to time, by which he may be aware of your athletic interest. At least once a year, and the best time is before serious racing, get him to give you a check over. A weekly record of your weight will give you a guide as to the amount of work you can tackle. It should vary very little except for a few days after strenuous competition.

The younger athlete, whose main field will, of course, be the sprint events, and who is still in the growing years, must continue to add weight throughout to maintain health.

The Author taken at about 30 kilometres in Berlin, 1936.

6. Conclusion.

Although every endeavour has been made to cover the subject adequately with the knowledge at present available, the pattern, especially regarding training methods, is constantly changing, and so the last word is never written.

We continue to learn much from our own mistakes and those of others just so long as we are wise and observant enough to recognise them.

In competition, the athlete who can rise to the occasion has the right mental approach. Confidence in his training methods will help in providing the stimulus necessary to the attainment of his main objective.

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