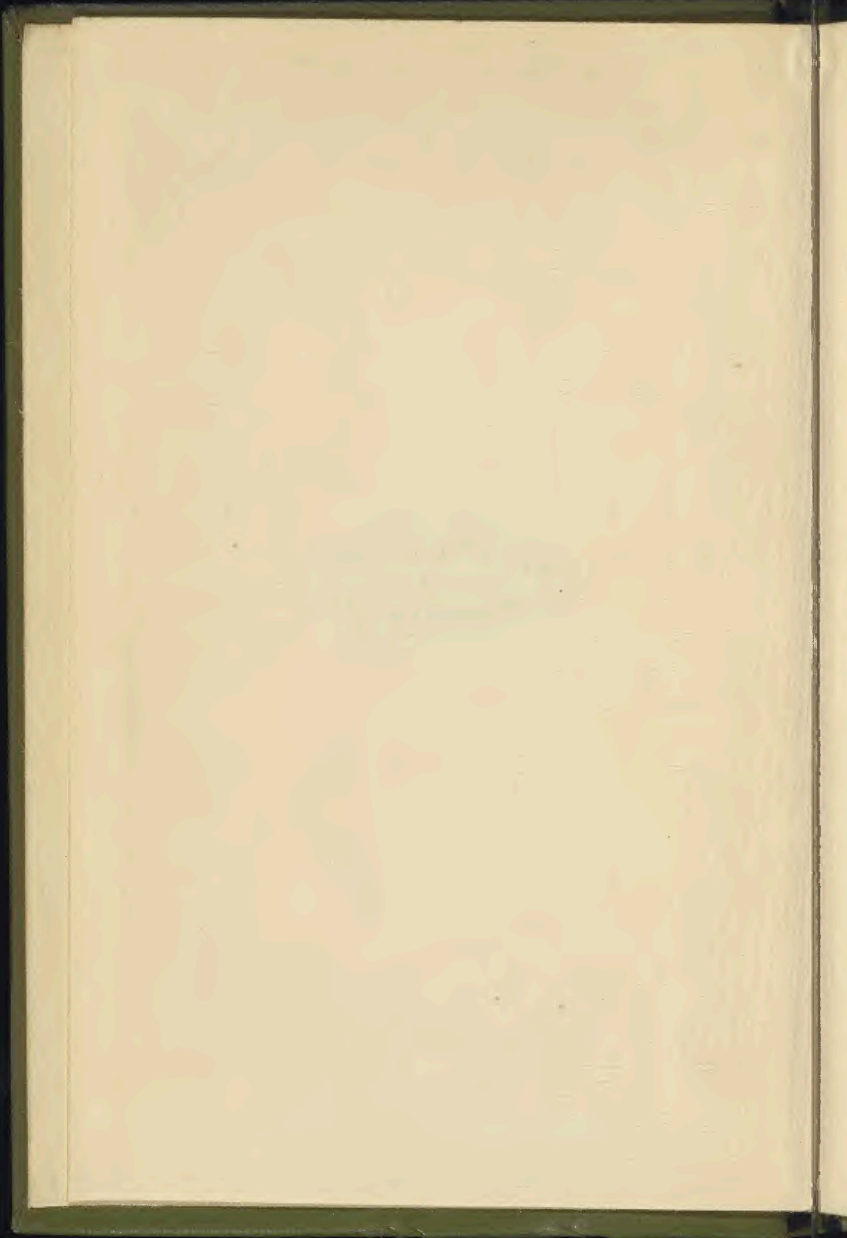


RUNNING
WALKING &
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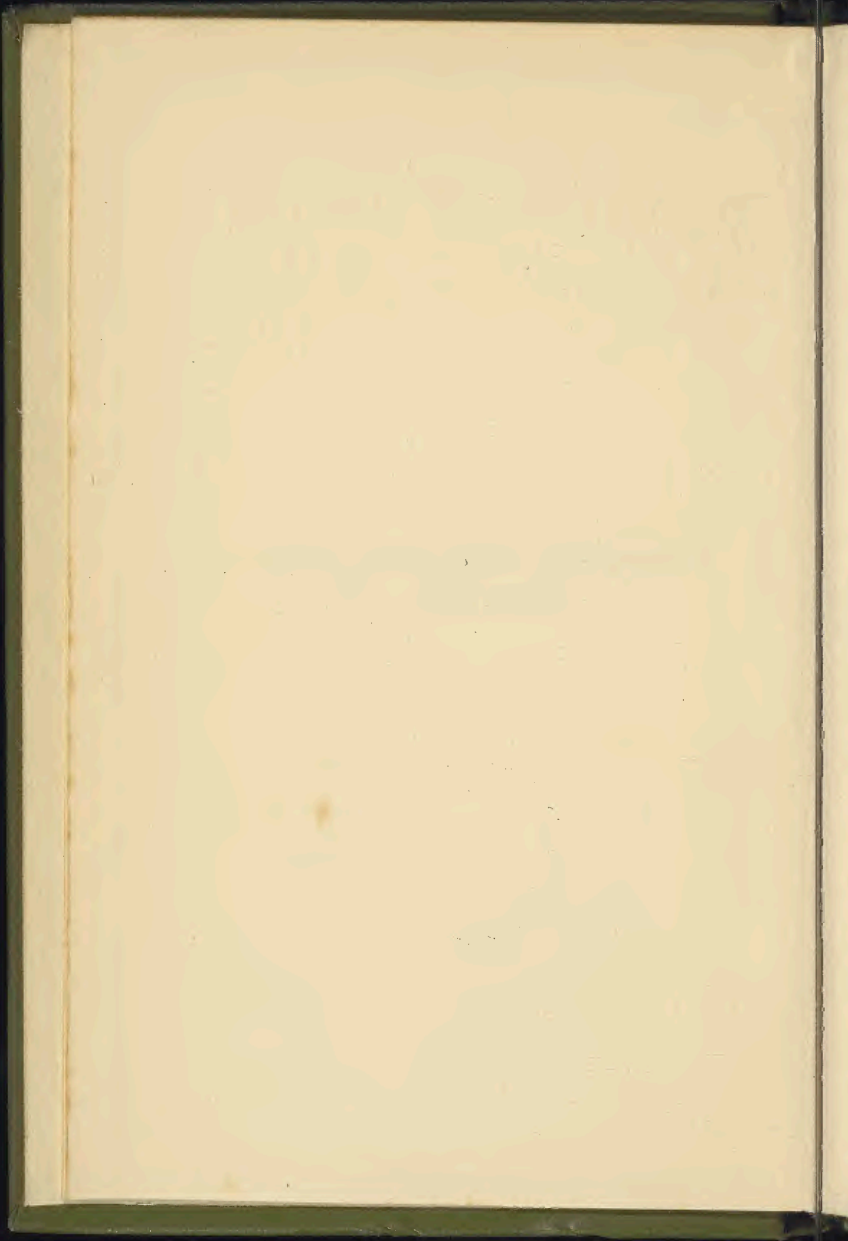
S.A.MUSSABINI

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**RUNNING, WALKING AND
JUMPING**



X

RUNNING, WALKING AND JUMPING TRACK AND FIELD ATHLETICS A BOOK ON HOW TO TRAIN

BY

S. A. MUSSABINI

Senior Coach to the London Polytechnic
Harriers

WITH FIFTY ILLUSTRATIONS



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INTRODUCTION

It is a fair statement to make, or so I think, that the movements of the human body, especially those incurred in the natural, if not altogether simple pursuits of running, walking and jumping are but little understood by the lay mind. Only now and again does one meet with a person possessed of the lightfooted action and easy body-sway so helpful in running, walking and jumping. As a rule, the really gifted athlete is a rare find for, taking the mass of the people, only a very few are endowed with the qualities which show to advantage on the track and in field events. Not always are the gifted ones fired by the same enthusiasm and keenness as the less favoured. When the right kind do fall in love with the branch of sport for which they are best adapted, there, indeed, is the champion already in the making. Unfortunately, instructors have to become reconciled to a certain slackness among the superior type of athlete and to take such compensation as may be found in the perseverance and general willingness to try and "make good" of the ordinary rank and file.

So the job of a coach is to make the most, according to his knowledge supported by all the encouragement and patience he has at his

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So the job of a coach is to make the most, according to his knowledge supported by all the encouragement and patience he has at his

command, of what material comes through his hands and genuinely endeavour to mould it into the best possible shape. Taken altogether, I doubt whether any teacher of such subjects as singing, dancing, etc., needs a nicer understanding of technique, of the temperament of those being taught, or of the enormous amount of detailed work to be gone over and over again, than the humble athletic coach.

As the chance does not often come to me of expounding my theories, I intend to make the most of this opportunity, so far as my space will permit. My reasons for writing are numerous, but the first is based on the really extraordinary, nay almost unbelievable, misunderstanding as to what constitutes good and effective styles of body carriage and limb movement; whilst my second reason is an honest desire to spread among aspiring athletes, especially the younger members, say, of the schoolboy stamp, a better acquaintance with the proper means of training in the particular branch of athletics which most interests them. I do not wish to say too much about myself, but I will just remark that the experience I have had of working hand in hand with many more or less capable runners, of preparing amateurs for hurdling, jumping and taking part in field-events has brought me into contact with hundreds of students, over a period of many years.

The time was when England led the world in track running and all the remainder of the athletic events. But whereas English athletics

have been at a standstill, except in the case of a few enthusiasts, among whose ranks I claim a place, other countries have forged ahead and taken our position as premier exponents of most of the track and even more of the field games.

It is not that we lack the old-time physical quality nor the desire to excel; the sporting instinct, too, is as pronounced as ever. Further, my experience has taught me that whatever doubts may have existed concerning an overabundance of war-time C 3 stock, the physical progress among the rising generation calls for no fears. The percentage of ability has risen and is increasing. This increase is reflected in: (1) the improved physical proportions; (2) the steadier demeanour and better all-round behaviour; and (3) the undoubtedly higher all-round merit of the youths one sees upon the track and in the gymnasium. Yet, as a nation, we are not maintaining our premier position.

Not clearly understood, however, is the necessity for teaching the youngsters how to make the best use of their natural gifts, so that the Empire may be able to point to them as very worthy sons. Between the ages of twelve and eighteen years, the youths and boys will be found most receptive and adaptable to athletic culture. Very urgently needed is a national form of physical drill, suited to British ideals, for our schools and colleges. Such a definite form of drill must develop supple muscles and a flexible frame, without which the most talented cannot hope to reach the real championship class.

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For this very reason, and hardly for any other, our former supremacy at the popular games, from boxing to tennis, from cricket to, shall I say, football, is lost or fast weakening. I have noted the attempts of many critics to place their fingers upon the source of the trouble. None of them have had wider opportunities than I of tracing the why and wherefore of the obvious decay. It is, simply, that our human machinery has had the "brake" attached to it. Some may not be in such a bad case as others, but most of our budding athletes are not "pulling their weight," or rather, putting their weight into their punches, their actions, their strokes and their throwing. They cannot do so because they have not the needed mobility or suppleness of frame. Artificial exercises too often stiffen and jar, instead of leaving the parts swinging loose like the pliable leather-belting circulating around an engine which distributes its power smoothly without pull or restraint. In a machine, should any over-pull or slackening of the communication cords be noted, then the belting is readjusted. Not so, though, with the human machinery; no matter how tied-up and hardened its muscular and underlying framework may be, seldom is readjustment attempted there!

Now pretending, as I do, to have studied and looked closely into these physical questions and applied the results of my investigations to athletes at first hand, I must be excused for making a further examination of what I consider to be one of the most profoundly

interesting subjects. So I propose to ask a question and leave my readers to think it over. All willing to appreciate the mysteries of Nature may easily find themselves victims of my own monomania which impels me to the study of the athlete in motion. Briefly, my question is: "Have you any idea how and why you are able to walk, run and jump?" That is all—just why you and untold millions of human beings, as well as animals all over the world, daily perform what can fairly be termed the miraculous acts of walking, running and jumping?

I put this question, as I would wish all my readers to be in precisely the same state of blank ignorance as I, myself, was the day I let my thoughts stray away to try and trace out the reason. I had to unravel the tangle for myself and search through the workings of the nerves, the muscles, the under-structure and all that goes to make for "human locomotion."

My thirst for knowledge caused me to dip into scientific books and treatises bearing upon the subject of my quest. Not readily or easily did I find the answer to my questions. Even when I had unravelled the matter I was unable, at first, to realise properly all that it unfolded to me. But understanding came gradually to me through reading such works as "Mouvement" (by the great French *savant*, Maret), "The Human Figure in Motion" (the work of a great Englishman, Professor Muybridge, honoured by the discerning Americans with a high position at one of their leading universities), and the writings of another authority,

Professor Pettigrew of Edinburgh University, whose papers on "Human Locomotion" are not as widely known as they deserve to be. These three scientists were contemporary, during the 'seventies and early 'eighties. To their careful discoveries, researches and truly wonderful "action-pictures" I am considerably indebted.

I have set forth the names of my guides because I owe so much to them, and I feel it is the only right and proper thing to give these "intellectuals" of a bygone day all the credit that is due to them.

Long practice has greatly added to and varied "first principles," sound as those have proved to be under the stern test of practice and comparison. Always, though, one finds some new point cropping up, some more intricate little problem than another to be solved. This is the very spice of the sport to all concerned.

S. A. MUSSABINI

(Senior Coach to the London
Polytechnic Harriers).

RUNNING, WALKING AND JUMPING

CHAPTER I

WALKING



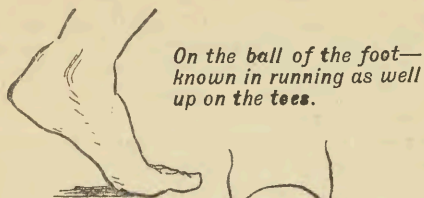
IF I am sure of one thing more than any other in the world of athletics, it is that walking, just "padding the hoof" or using "Shank's pony," is the bedrock of all physical development. Natural walking in contradistinction to the false and forced movements often adopted by the exponents of race-walking, is undoubtedly the truest athletic exercise in which we could indulge. It is the foundation-stone of such feats as running, jumping, hurdling, throwing the javelin and discus and many more which one could mention. All are based upon the ease and power of the individual performer, backed, of course, by his knowledge of the technique involved in the particular branch of sport concerned. Walking is

the real thing, the basis of what is scientifically known as "Human Locomotion," a term used for every kind of movement of which the human body is capable.

Like singing or any other natural gift, the art of walking may be brought to a considerable degree of perfection: (1) by an understanding of its chief requirements; and (2) by regular practice on approved technical lines. But practice and science do not demand that track or competition walkers should abandon the everyday process of walking and adopt a style which is entirely different. It is undoubtedly wise to retain one's ordinary way of swinging the legs. If more of the race-walkers understood this, we should see fewer stiff-legged contortionists with a rolling gait, the result of too much heel and toe work.

Youngsters must be specially warned against such artificial style of locomotion. They see an athlete who takes their fancy, and they copy him in his every action. Often, the more the athlete possesses a forced, over-elaborate movement of the arms and legs, the more the youngsters look upon him as a pattern to be copied. It is not realized that an ease and smoothness of movement provide the least fatiguing method of progression.

A very notable fault in walking is incorrect footplay, such as putting one foot out at an angle of 30 degrees and shaping the other in a straight or nearly straight line under the body. This form of placing the feet is humorously known as "ten past twelve." But the draw-



*On the ball of the foot—
known in running as well
up on the toes.*

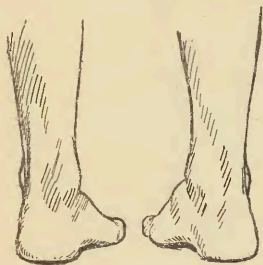


*Out turned feet
in running.*

A pair of out treading feet

back in leg propulsion, such as a reduction of the striding length, is of small account as compared with the disastrous results accompanying an out turn of both feet. This is sometimes termed "splay-footed," also "quarter to three."

But while an out-turning of the feet is to be deprecated, there is a good deal to be said in favour of one in-turned foot, and more still if



The in-turned pair of feet.

the athlete has both sets of toes leaning towards one another. Naturally, I am not suggesting that this action should be cultivated to the point of producing deformity.

The in-turn should not be greater than here shown. The one straight and the other in-turned foot were a characteristic of those pedestrian masterpieces of forty years ago, i.e. Harry Hutchins and the great one mile to ten miles track and cross-country runner, W. G. George. Both had a pronounced in-turn of the right foot and a straight left foot. Also, the greatest half-miler of thirty years ago, Williams of Sunderland, had an in-turn of both feet. So has the more modern sprint champion, W. R. Applegarth, and the present-day road-walking celebrity, G. R. Goodwin.

That bad faults may be suppressed and good habits cultivated is beyond a shadow of a doubt. The human frame is most adaptable. It lends itself to the shape one takes in ordinary everyday movements and even more to the positions assumed by the head, arms, legs, feet and body in training on the track and road. I can speak most feelingly of the many wrong movements it is possible to acquire, because it has so often fallen to my lot to try to remedy the wrong carriage of those coming to me for tuition. Really, the only sure system of letting the athlete know where he is wrong and rectifying his errors is to check and teach him at the walking paces.

To realize thoroughly the value of good walking it must be explained that running, of all descriptions, is a forced walk. There is nothing much dividing a walking step from a trot or a fast run. Lift the knees a few inches higher from the ground than in your walking paces—and you are running. The whole essence of a correct walking gait is always to have a part of one foot on the ground while the opposite leg is swinging clear and both feet (the heel of the front foot and the toes of the back foot) momentarily come to rest at the end of the stride. In correct walking, the feet move very near the ground and the lifting motion of the moving leg is barely noticeable. The foot just skims the surface on its way to rest.

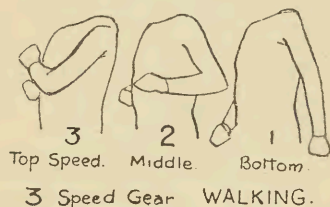
Many evasions of the true walking methods have been seen. Some race-walkers have

attained championship rank although their actions often outraged all the laws that are usually accepted. One of the worst faults is the sitting-down attitude with both knees kept more or less bent. Going to the other extreme, a lifting of the arms, shoulders and head, assisted by high lifting of the feet combine to make a very weak style. Equally faulty is the quick, jerky stride which may be called "running on the heels," which may be traced to excessive arm-movement.

Actually, to be walking properly, a man should not be striding further than the length he can reach when thoroughly stretched out and poised, as at the end of a string; that is, on the toe of the back foot and on the heel of the front foot. This is an automatic test and the surest guide to the mode of progression. In fact, if the judges of a walking race were to have the full striding-lengths of the various competitors placed before them and it were possible to measure off the resting-places of the feet, the matter of proper and improper movement would be readily solved.

I do not wish to weary those who look down upon race-walking as an unsatisfactory way of racing. My aim is to attempt to explain the tremendous importance that walking, just the good natural everyday walking, is to all who wish to train for track, road and field games. It is so very necessary for all to walk well, especially those who must use their limbs and their complete physical make-up in a smooth, effortless way.

Having discussed the correct placing of the feet, I will now deal with the swing of the arms. As we walk, we all instinctively swing the arms—the movement helps us along. Now, since the swing assists us to progress, it is very clear that a proper swing will help considerably and an improper one will help far less. What is a proper arm swing? Certainly not the grotesque and queer mannerisms indulged in by some track enthusiasts. Indeed, there are not sufficient trained walkers in England who



have a pleasant, effective and supple arm action. In Italy, we see a far larger proportion of walkers with a natural carriage, a free stride and a facile play of the arms.

Personally, I advocate and teach what I call a "three-speed gear" set of arm swings. A little attention to these will, I know, repay the trouble taken.

At No. 1, or bottom-speed, the hands are carried at their lowest pitch across the groins. They work loosely in and out, the opposite arm to the opposite leg. This means, of course, that the right arm swings inward as the left

leg is making its stride ; and the left arm swings at full length beside the body. When the right arm and left leg have completed the radius of their swing, the left arm and right leg begin their upward and outward actions. The limbs must work in thorough harmony. As the arm and leg are momentarily at rest—and the completion of each stride entails a slight pause—there should never be any doubt as to the positions of all four limbs nor with



Loss of power Strong but Freedom &
Tied. Power.

RUNNING.

the poise of the body and head. All have their definite places. If these places are not adhered to, and an arm or leg, to say nothing of shoulders, hips, trunk and head are out of their correct positions, the walker will be out of his true balance. Some parts of him are doing too much and others too little.

I am going to tell you who run your eyes over these lines of print that walking ranks among the fine arts ; and, I was almost on the point of adding, the lost arts. It is, moreover, an accomplishment. Tell me, if you know

of anything more becoming than a smart, upstanding, free walking gait? The rolling hip, the easy sway of the arms, the just perceptible lift of the advancing thigh, the straightforward alignment of the feet, and a flexible but nicely erect neck and head go to crown this picture of human symmetry. More often than not I find that it is the young woman who lives up to this ideal in ordinary walking rather than the man.

For some reason or another good walking or a good walker is much less frequently seen than in the days when cricket was really the national game. The old game bred a suppleness of limb and a looseness at the shoulders. No finer exercises than throwing, bowling, stooping, running and catching, aye and batting, for the physical needs of the athlete (in his younger days), can be devised.

A bygone scientist propounded the theory that all animal movement is based upon movements resembling the figure 8. I have come to respect this theory and its expounder, Professor J. Bell Pettigrew, of Edinburgh University, for most surely do the movements of the arms and legs in proper, natural walking and running serve to make a figure eight. What is more to the purpose, the most finished and fastest walkers and runners it has been my good fortune to see perform the details of their strides in this harmonious fashion.

Many ordinary civilians indulge in a figure eight motion, it is true, but with them the eight is usually too small at the top because

the legs are asked to do a greater share of the movements than is rightfully their due. As a fact, most people are not accustomed to continue the free and easy arm-actions of childhood. If I were to seek after examples of good natural walking and running, I would not go beyond children of school age, both boys and girls. The very best of their kind really need but a small amount of coaching, as I have proved in practice, in order to attain the finest athletic form.

That the Army style of marching brings about what it is intended to do no one can deny, but the straight upward thrust of a rigidly tight arm and its equally rigid and straight descent, beside the body, is hopelessly wrong from the point of view of rendering the best service to its users. The Army authorities have contrived to standardize the marching pace, so that all, irrespective of height and length of leg, from the very tallest soldier to the smallest drummer-boy, just step out a regulation 30 inches. As showing the very considerable control of the arm-swing over the legs, this really remarkable unison of striding pace is the outcome, entirely, of the unnatural and forced movements of the arms demanded in the drill-book, and most rigorously enforced by those entrusted with the training of His Majesty's Army. One can realize the necessity for all being in step on the march. It keeps the men together, the best and the worst, and gives a combined spirit. When everything is said for the Army marching



From left to right: (top) Marathon runner's erect pose and easy arm and leg work as compared with the sprinter's powerful thrusts and compact position; (bottom) the middle-distance runner's swinging stride and a skeleton outline of the shoulder, hip, elbow and knee movement; (centre) the facile long-arm swing and active striding of a girl walker.

cult, its advantages, from an athletic standpoint, or such of them as it may possess, are quite outweighed by many apparent disadvantages. So much so, that despite the presence of the very flower of the nation's manhood within its ranks, the most naturally gifted among the trained soldiery will need a tremendous amount of overhauling before being competent to deliver the best that is in him. Only too well do I know the truth of what I am saying, since I have very many ex-service men pass through my hands. Actually, at the time of writing these notes, I have under me one of the finest natural specimens of a runner to be seen anywhere. My task with him is to try and suppress the ingrained stiffness (he has "the brake on" at all points) due to prolonged Army training.

In reality, walking is far and away the least exacting of all physical exercises. Providing you walk naturally and freely, swing the arms in the loosest manner, so that you barely feel them attached to your shoulders, you are walking as Nature desired you should walk. As I have already said, this smooth carriage of the arms is not as common as it deserves to be. Even in the most strenuous of race-walking, in spite of the fact that it is thought to be the most fatiguing of all kinds of competitive racing, the finished walker can get the utmost out of himself by cultivating a smooth arm-swing and a true flexibility of the legs, together with a supple, responsive stomach, chest, shoulders, neck and head. Muscular

tension and a strained bearing should be avoided if speed is to be gained. The learner must be told and shown that if the possession of great strength is an asset to the athlete, it must be used with discrimination and as an aid to nimbleness and activity. Nobody can make a champion walker, runner or jumper of the strongest man on earth if strength, alone, be relied on.

Walking is the easiest exercise of a purely natural order, simply for the reason that the walker has, or rather he should have, a part of one foot always resting upon the ground to assist in the levering-up of his moving leg. A good deal of the athlete's power comes from the ground beneath him, so the walker is always in touch with that source of his strength. He is unlike the runner and the jumper, who has to lift the whole of himself from the ground every time he makes a stride or transports his full weight through the air. The walker is eased of strain, if he will allow himself to be in constant contact with the ground.

For training exercises in walking to bring one's leg and arm actions into the closest relationship, I know of nothing better than the "three-speed gear," previously mentioned. It is most strengthening and invigorating, apart from being a guarantee of a free and nicely balanced arm-swing, in addition to a proper pose at all parts. Then, to make the uttermost of the leg stretch and to know how to employ the hips to swing the legs and feet so that a straight line of progress be kept,

walking along a straight line is a valuable exercise. To place the feet upon the same line is the very essence of footwork in walking and running. It means using oneself without the waste effort which usually comes from the feet progressing along two lines, neither of which is as regular as it ought to be. Now and again a "wide strider" in sprinting has proved a capable man, in spite of his incorrect style, but that does not disprove my contentions.

Correct placing of the feet is due to the easy, supple motion of the parts above. The head must be centrally set and not inclining one way or the other; shoulders and the trunk, generally, should face straight to the front, with the legs, the moving one controlled by the wriggle and roll of the hip above and the downward leg smoothly bearing the weight of its partner. Actually, to carry out the details of the footwork to the point of perfection the heel must be directly behind the toes. While the stride is being made, the toes gradually turn away from under the body and they make a corresponding inward turn. These actions are most noticeable at the middle part of the foot-swing when the feet are passing one another. I recommend a searching inspection of illustration on page 4 of the art section as presenting the foot-action needed to give the walker the ease which prevents so many from using the straightforward step.

To use the feet correctly during contact with the ground, we must let the heel drop first, then place down the flat of the sole and, as the

heel is raised, the pressure is transferred further and further forward until the very last flick of the shoe with the soil beneath is at the very extreme tip under the toes.

So the feet really perform a rolling-over motion on the ground, and the expression "the ball of the foot" is well in keeping with the duties Nature wished it to undertake. The foot of a child, before it has been boxed up in a more or less stiff boot, is something for the track athlete to examine and admire. It will show him, as no words of warning could do, the lissom and pliable state his own feet ought to be kept in. The feet of an athlete can be likened to the foundation-stone of a building. Everything rests and depends upon them.

Above anything else, keep the feet clean. There is nothing better than soap and water. It should not be used occasionally but every day throughout the year, more especially after a walk or run over the road, track or country. Cold water, followed by a good towelling and hand-rubbing is a wonderful tonic to the feet. If the raw, cold water is a trifle too spartan for your feelings, temporize by first bathing them in warm before entrusting



A true rear-running leg.

them to the thoroughly cold water. This mixed form of water treatment, both for the body and the feet, is indescribably refreshing ; but, of course, the purely cold bath or spray gives the best results. Not only must the feet be sweet and clean, but the footwear should be equally so. Cleanliness is frequently the hall-mark of high ability. Though all may not rise to the championship standard, all can, at least, be clean. A very particular form of lack of cleanliness and care among athletes—and others—is to be noticed in uncut or even ingrowing toe-nails. These are unsightly, a discomfort and a possible source of grave foot-trouble. The nails must be carefully and regularly pared.

I have spoken at length about walking because it is the backbone of the best athletic system. At the same time, I have outlined, generally, the way to the faster movements which follow. For it is a far more difficult matter to recognize the faults of a runner than those of the slower-going walker, who is, indeed, the "slow-motion" picture by which the students of athletics may study the science of what is known as "human locomotion."

Yes, walking and running bear a close relationship. To change from the walking action to the run can be done most readily. Just go swinging along at the walk and work up to a smart pace, then drop your whole frame, so that head, shoulders and the whole of your bodily weight leans forward, the legs are well bent at the knees and—"Hey, there ! Mr. Referee, he's running !"

CHAPTER II

LONG, MIDDLE AND SHORT DISTANCE RUNNING

NOWADAYS, it is the $26\frac{1}{2}$ miles Marathon that stands for the limit in long-distance running. Fifty years ago, though, there were six-day races, both walking and running, termed "go-as-you-please" events. They were immensely to the popular sporting taste of the day. In those times, too, a fifty miles running or walking championship was quite a common occurrence. The runners trained most conscientiously for their races. They must have been blessed with great natural stamina and an inborn determination to keep plodding on day and night for six days on end. Some of the distances covered, under cover and the lighting coming from evil-smelling naphtha lamps, were truly wonderful. The champion of them all was the Sheffielder, George Littlewood, who ran 623 miles within the stipulated six days and, later, walked 531 miles in the same allowance of time.

If it be put to the test, I think these two sets of figures connected with Littlewood's running and walking achievements will go far to prove the comparative ease of good walking as compared with running. Littlewood's walk was 92 miles behind his run. This makes a

very decided point in favour of walking entailing less fatigue than running. We can trace this to be so in many directions, although to emphasize this point I must let it be known that Littlewood was capable of running over 11 miles and walking 7 miles, each within the hour. Therefore this ratio of 11 (running) as against 7 (walking) in one hour bears small resemblance to the 623 (running) and 531 (walking) over six days, or a rate of only 4 to 3.

Well, you have changed your action from a nice swinging walk to a loose, shambling sort of a run, the kind of a run you feel would not distress you to keep moving at any more than a walk. This is the lowest form of running which, if intelligently practised, can be very helpful to the boys and youths who indulge in road and country spins. One may go "paddling" along, the feet lifting ever so little above the level of their swing in the walking paces. The effort is so slight that the breathing organs barely reveal the little extra strain imposed upon them. Nor is the all-important detail of breathing, more particularly the intake of air, troublesome in any respect. I can here, too, dismiss the vexed problem of how to breathe—through the mouth or through the nose? My advice to all athletes is to use both mouth and nose for drawing in the fresh air, and the same for expelling it. Most certainly, both the mouth *and* the nose!

For long-distance running of all kinds, there is very good reason to recommend a low carriage of the hands. The most natural and,

in my opinion, the best style of any, is to use the arms and hands in a modified No. 1, or bottom speed walking swing (see arm-swing movements in the previous chapter). You can swing the hands lightly inwards and outwards across the groins or with a forward and backward straight out and back action. The leading hand moves by the side of the body about a foot in front of it and the rear hand reaches the same distance behind. When one hand is at the end of the forward movement, the other should be at the end of the backward swing. The legs work in the closest combination with the arms, so that the opposite leg completes its stride as the leading arm is at its furthest forward stretch—not that there is any stretching in the play of any of the limbs, but merely a loose, gentle, pendulum-like passage of arm and leg throughout. As with the leading hand and foot so the rear hand and foot travel to their backward limit at precisely the same moment. And to lay a stress upon the harmony of action, the hands will be exactly passing by the sides of the body and each in the same place, with the two feet side by side, the one swinging by, the other raising itself towards the toe as it rolls over on the ground in the middle of the stride.

Such is true well-balanced running, not at all exacting nor complicated but, in actual practice, fairly simple to perform. A feature of this straight outward and backward arm-swing is the manner of shaping the hands. They should be kept closed with the backs

of them facing outwards. There is weight, and a certain compressed power in the closed hand, which is merely following out the approved claims of the pendulum or "governor" of a machine. The valuable assistance lent to a runner by this means is easily to be tested, and if this help means an advantage of nearly a full inch per stride (which it most certainly does), what justification has anybody for recommending the open hand with its lessened power and greater air resistance?

The writer will be very glad, at any given time or place—publicly or privately—to demonstrate the help of the closed hand in walking and running.

By closing the hands and carrying something inside them, preferably a running cork, one has assistance in keeping the fingers together, the thumb falls into place against the outer and centre knuckles of the two first fingers—a surprisingly valuable factor in concentrating one's arm and body power. It is, or I feel it is so, a pity that such false counsel should be spread abroad concerning the help every class of runner and walker may obtain from a loose, yet secure, hold upon a running cork, a roll of paper or even a tuft of grass. The old maxim of "an ounce of practice is worth a ton of theory" can be quickly tested if we note the striding of anyone who knows how to run first whilst using corks and, then, whilst running without them. It is all these small details which count in the equipment of a runner.

But the forward and backward swing,

serviceable though it proved to several famous old-time distance runners, is not the only nor the most telling of all points to remember. That natural, inward swing across the body cannot be surpassed. How little is generally understood of correct bodily motion! One of the things that puzzles me badly is the right-angled up-and-down arm beats one sees taught and insisted upon on the barrack squares and in the gymnasiums. How can we develop champion boxers, when the shoulder-muscles and shoulder-blades are kept so rigidly set? Looseness of limb and body is Nature's gift. We should still lead the way and have the same flattering testimonials given to our track athletes which I heard extended to our footballers at Stockholm, where the Swedes were most enthusiastic about the "Englander spiel," or English game expositions of our teams.

The whole effect in walking and running comes at the centre of the stride, just as the swinging foot is in line with or passing the downward foot. One leg is pulling and the other leg pushing its way forward. The whole of the power, pushing or pulling, is concentrated in the centre of the leg-swing. To ensure the very best motion the legs *must* be in the correct position and doing their work exactly in time together. It is a very common fault for walkers and runners to be out of beat and to lose, not their combination of leg-swing alone but their body balance with it. On the other hand, there are running freaks who make the full

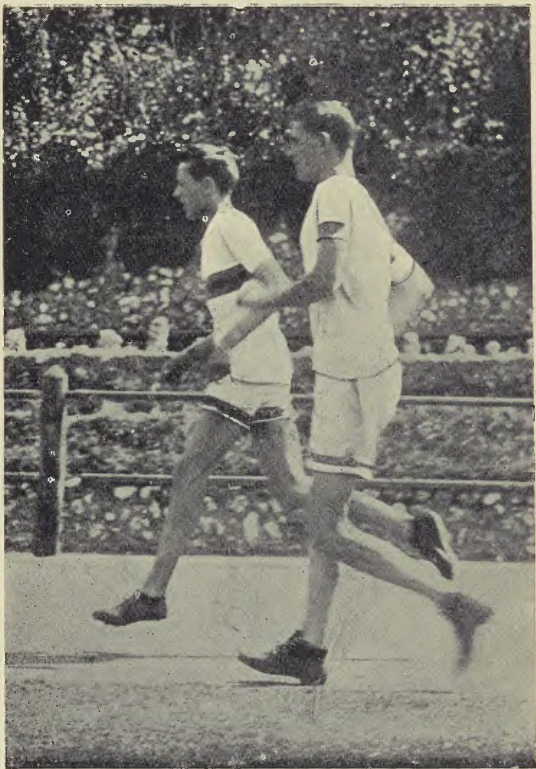
stride length on one leg and very much lessen the other one, so that their leg-action is most uneven and curious to see. A few select runners, notably J. M. Cowie, a champion of the 'eighties, and David Basan, of the London A.C., who has transmitted his peculiarity of striding to his son, an upstanding young man of considerable possibilities are exceptional cases, however. They illustrate one of the many possible divergencies from correct form.

It is as important to swing the arms in true time-beats as the legs. Again the power rises to maximum as the swing is half-way through, when there occurs a similar double-action of pushing and pulling. The half-way mark is reached as the swing of the incoming arm causes the half-lift of the forearm and elbow beside the lower ribs. As the rising arm comes forward into position, so does the falling arm assist progress at the opposite side of the body when it drops to its momentary out-of-beat place beside the top of the thigh. Then, in the rhythm of the striding, again comes the push off the ground with the rearward foot, giving the gliding step of the walk, the higher one of the runner or the pure upward spring of the jumper. Coincidentally with the push-off of foot-play will be, if technique is well-ordered, a lifting movement of the rearward hand and arm. Also, there should be an equally balanced striding and swinging of legs and arms, rising and falling first on one side of the body and then on the other. In absolute fact, as any ordinary person may recognize for himself (or

RUNNING, WALKING
AND JUMPING
TRACK & FIELD ATHLETICS

ART
SUPPLEMENT

THESE illustrations portray some of the finest athletic figures ever seen; many original "action" pictures taken by the author, and several sets of "slow motion" serials by the late Professor Muybridge. Practical styles and faulty examples are shown, and each illustration offers its own clear teaching.



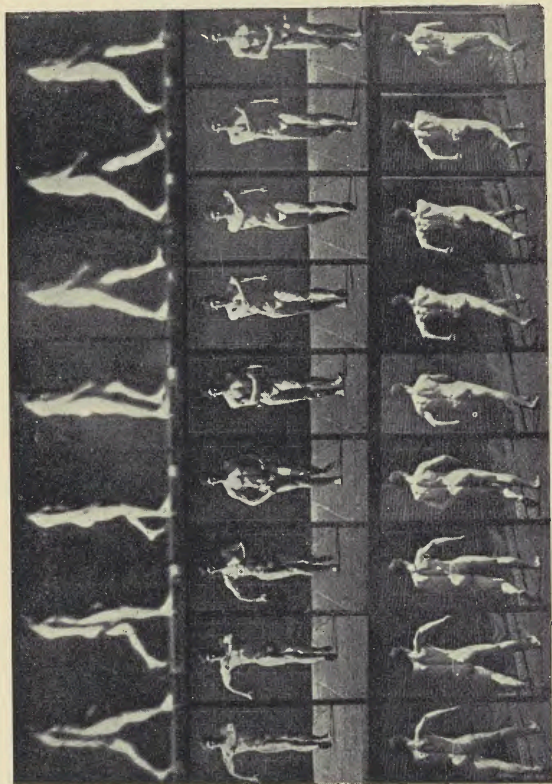
ILLUSTRATING THE DIFFERENCE BETWEEN RUNNING
AND WALKING

The runner with both feet off the ground, and the walker with one foot on and one off.



FAIR HEEL AND TOE!

A fine figure of a walker at the end of his top speed stride.



THREE SERIAL WALKING MOVEMENTS

Top line : the simple, natural walk in two strides. Second line : the race walker (swinging right arm further than left, a fault). Bottom line : rear view of the race walker.

Top line : the simple, natural walk in two strides. Second line : the race walker (swinging right leg forward, then back, then forward again). Bottom line : race walker of the past (swinging right leg forward, then back, then forward again).



HARRY GREEN

The Herne Hill great Marathon runner—a former record holder of the Windsor to London run. Steady, easy flat-footed striding or near to walking pace.



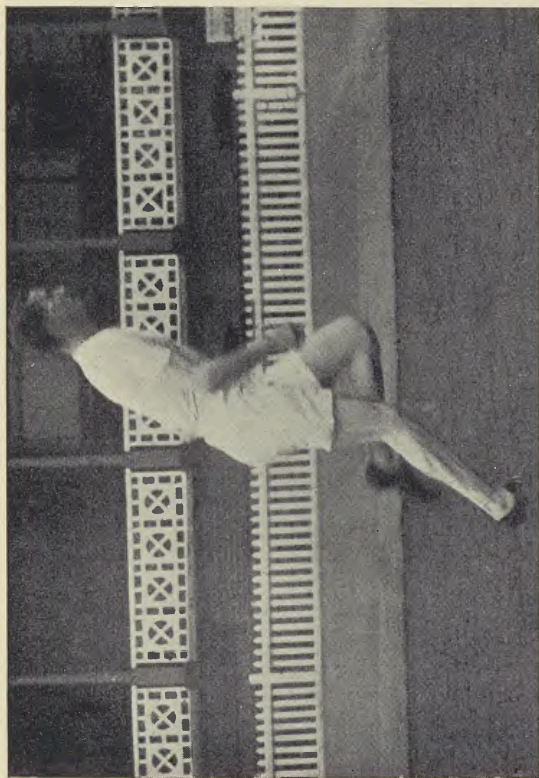
A LEG SWINGING LESSON

The runner on the left, by reason of the lower action of his back leg outclasses the runner on the right, whose back leg swings much too high.



A. G. HILL

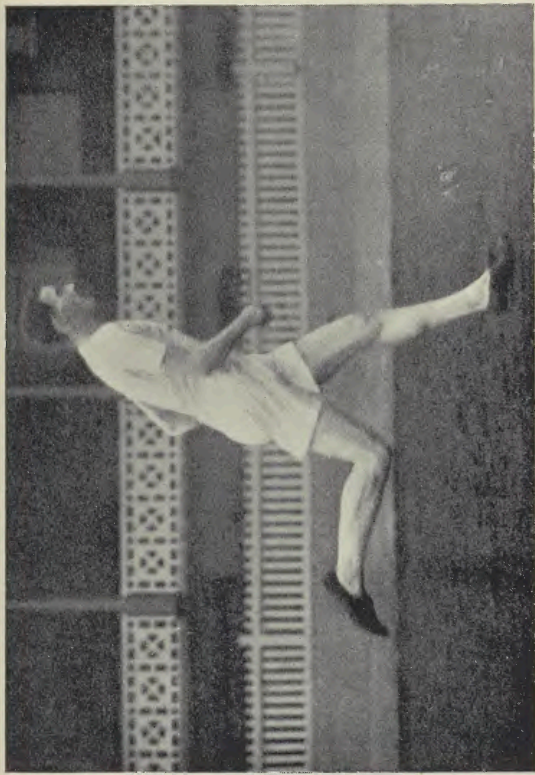
Front view, coming round a "bend" of the track, a fact which may account for the left arm and hand being turned away from the body. Leg action great.



HALF WAY THROUGH THE STRIDE

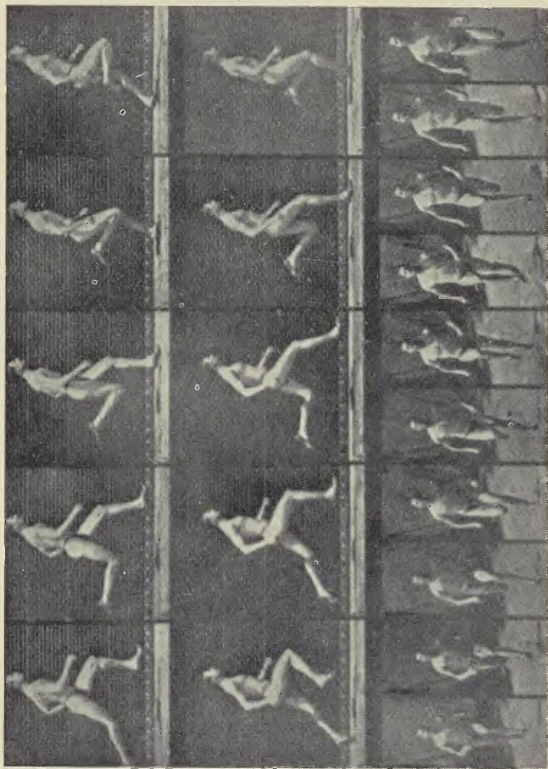
Albert G. Hill's correct form. Body angle such as few have equalled, back leg pushing—front leg pulling and hands at natural pitch.

Albert G. Hill's correct form. Body angle such as few have equalled, back leg pushing—front leg pulling and hands at natural pitch.



THE POETRY OF MOTION

Albert G. Hill's easy stride carried out under the nicest body and head angle and low arm carriage imaginable.



Sectional pictures of two strides taken by a brilliant middle distance runner—broadside and full face views. Note the thigh action and low carriage of the hands.



HANS BRAUN

The German middle distance runner whose length of stride and truly beautiful moving are good to remember. Braun won the A.A.A. half-mile championship in 1909, 1911 and 1912.

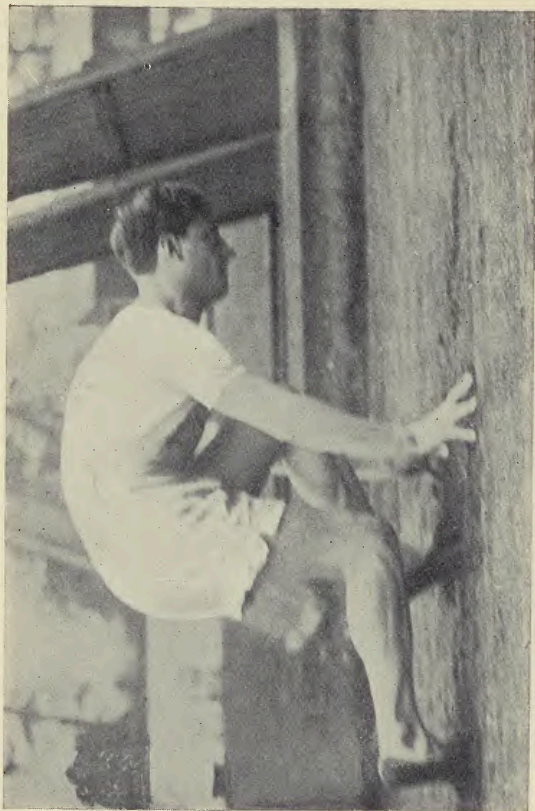


One of the straining, wide open arm swingers who run on an upward head, and a higher knee lift than very fast sprinting calls for.



A STRONG, BUT BAD RUNNER

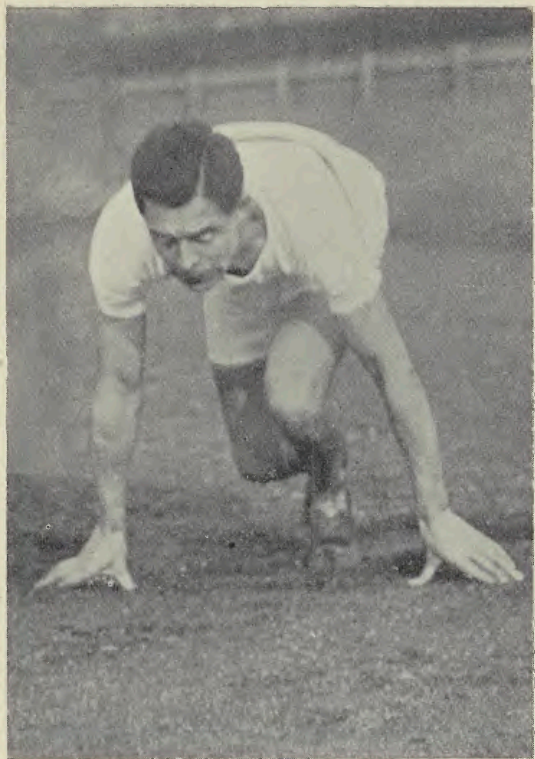
He is "putting the brake on" by his faulty arm, head and body work.



"GET SET!"

The famous sprinter of pre-war days, W. R. Applegarth, crouches at the command of the starter and "listens out" for the report of the starting pistol.

The famous sprinter of pre-war days, W. R. Applegarth, crouches at the command of the starter and "listens out" for the report of the starting pistol.



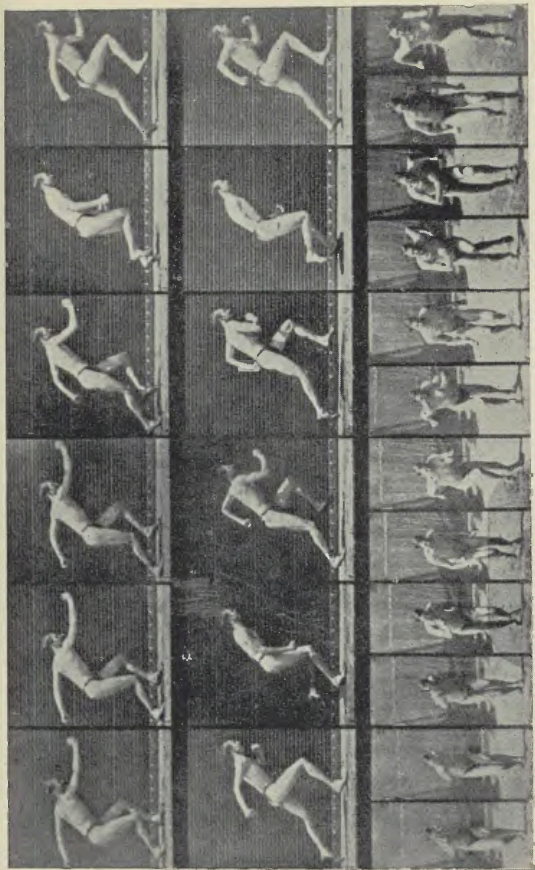
H. F. V. EDWARD

The famous sprinter (thrice "double" A.A.A. sprint champion) on his "mark."



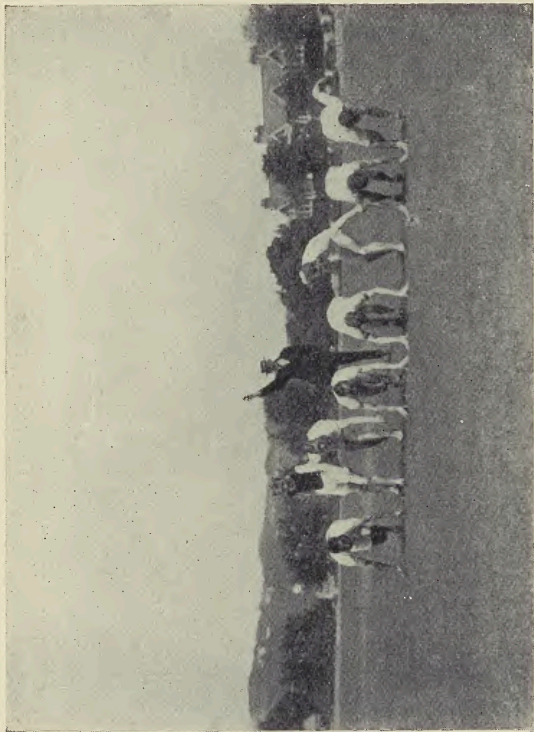
AN EXPONENT OF THE OLD STAND-UP START

Very picturesque and not so much against a speedy beginning as some may believe.



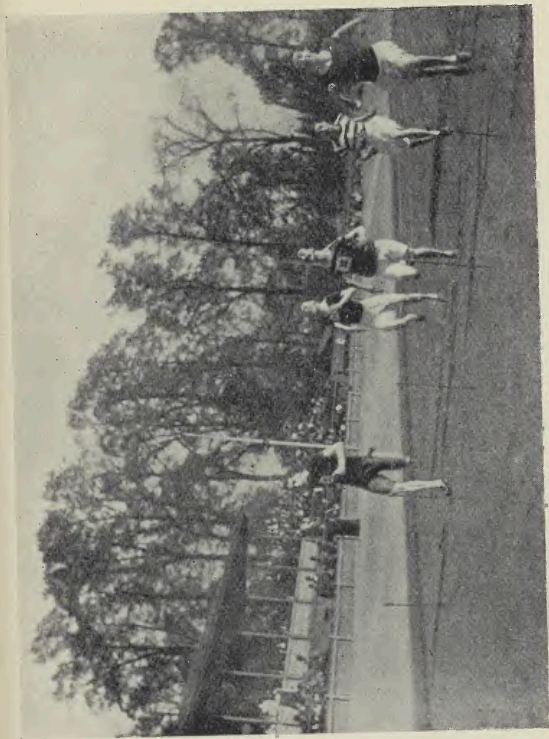
A SERIAL SPRINTING EFFORT FROM THE OLD STAND-UP START

Note how in the first few strides the sprinter's feet keep close to the ground in working up speed.

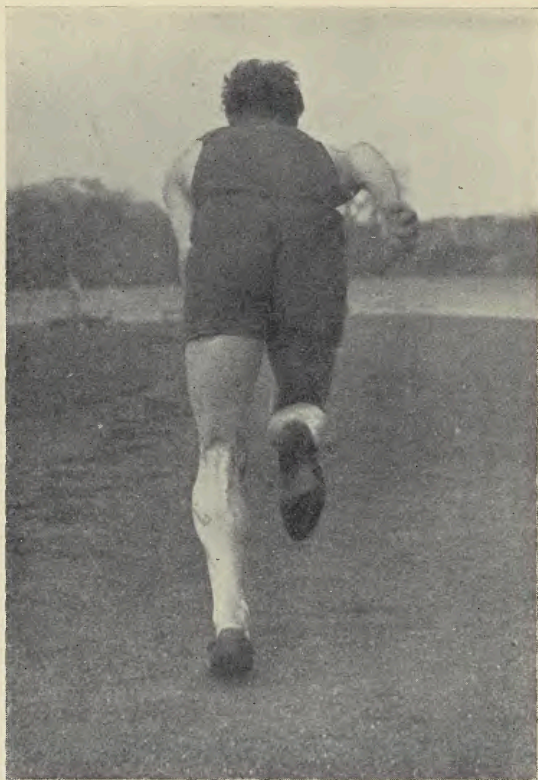


Every known way of starting, both ancient and modern, as exemplified by a line of well-known runners, including H. F. V. Edward, A. G. Hill, J. Rooney, W. A. Hill, R. Black, F. R. Shaw, and others, on the "Preston Park" track, Brighton.

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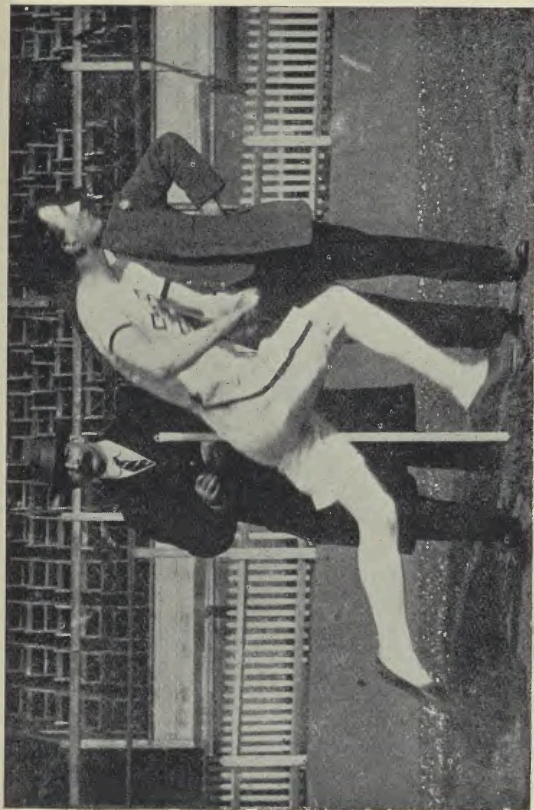


Final heat of an old-time 100 yards handicap on the Herne Hill track, won by the up-standing scratch runner and one of the best of his day, E. W. Haley (on the right) Note the "upish" style of head and arms and the twisting body of the runner in the striped vest.



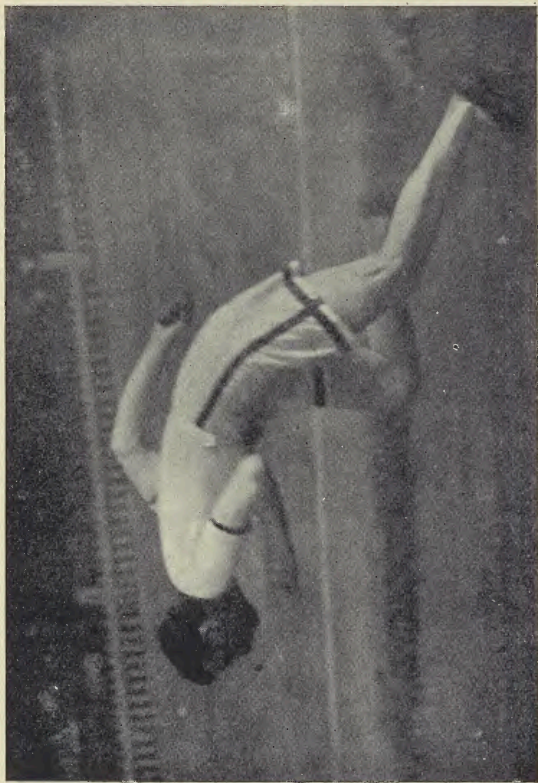
W. R. APPLGARTH

Back view of the famous sprinter (A.A.A. double sprint champion 1913 and 1914), revealing his true foot placing, his carriage, and under the body arm action.



A SPRINT "FLYER"

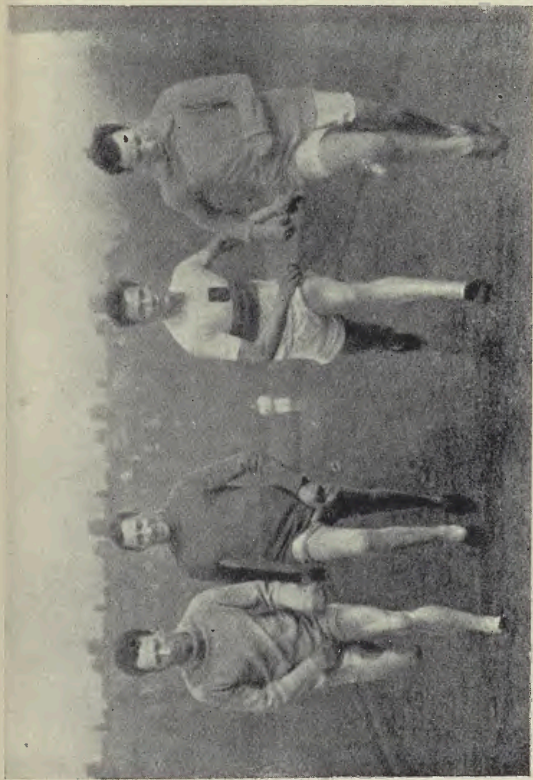
Note the waist-line, "hands in lap," close arm-swing, the best of any if the runner can acquire it.



FIRST STRIDE OUT OF "THE HOLES"

Just a slightly lower pitch of the chin needed for the ideal first stride action, in which the body should be shaped parallel to the ground beneath.

the chin needed for the ideal first stride action, in which the body should be shaped parallel to the ground beneath.



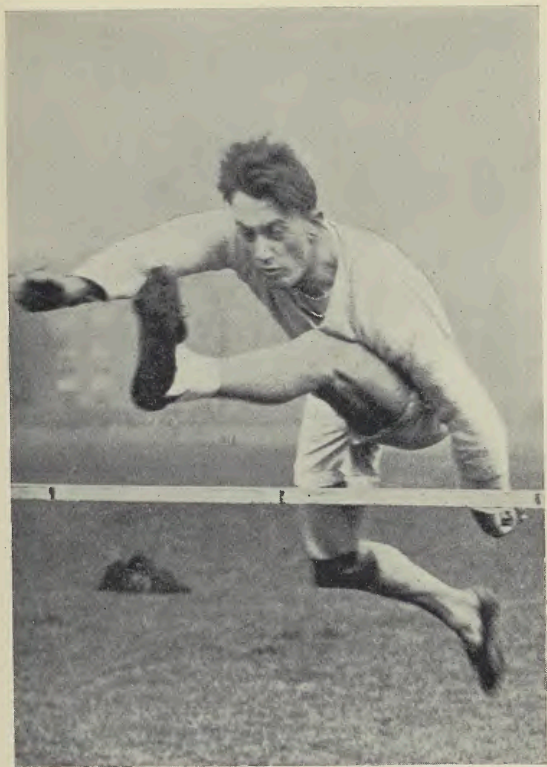
A VARIETY OF ARM-MOVEMENTS

The two outside figures are those of well-known sprinters, the inside pair are middle to long runners. The runner second from the right is swinging a long way too far across and wide of the body.



EARL THOMPSON

The Canadian holder of the record of $14\frac{2}{3}$ seconds for 120 yards over the high hurdles! His Olympic victory at Antwerp will live for many a long day.



F. R. GABY

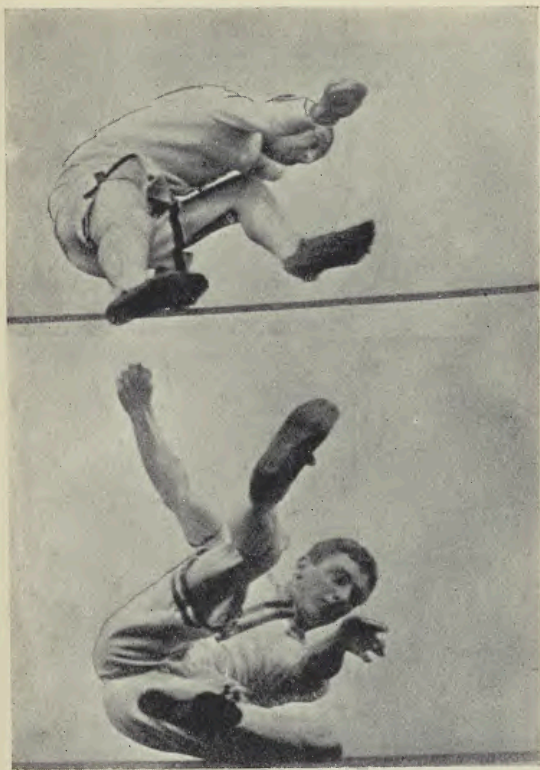
(A.A.A. high hurdles champion 1922 and 1923) straight-legging
and using his patent long arm swing.



A HIGH-JUMPER ASTRIDE THE BAR

Perfectly arranged at all points to give the finishing touches for a kick, turn, twist or roll-over clearance.

Perfectly arranged at all points to give the finishing touches for a kick, turn, twist or roll-over clearance.



CROSSING THE BAR!

Two styles among the many which the high jumpers have to show.



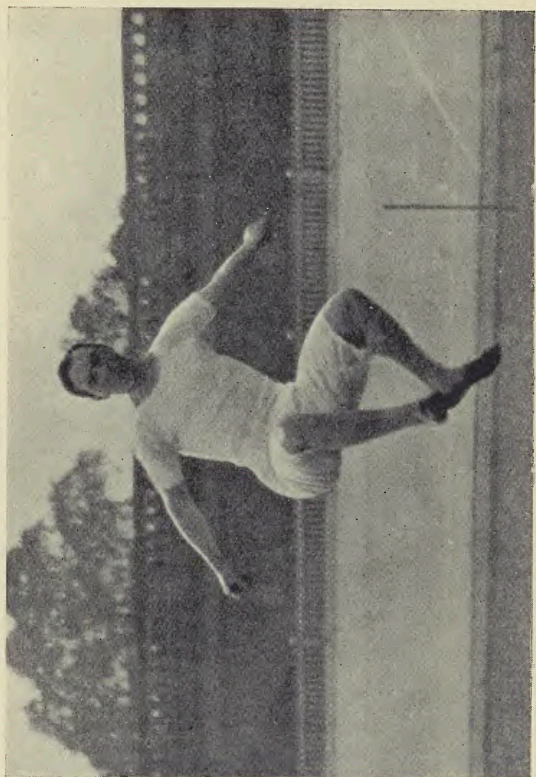
Serial effects gathered by the camera from two high jumps—a simple double-footed jump and the turning to face the bar jump.

the turning to face the bar jump.



"CLEARED IT!"

Sweeney's classical sideways jump over 6 ft. 1 in. at old Stamford Bridge at the 1900 A.A.A. Championships, when the American team almost swept the board.



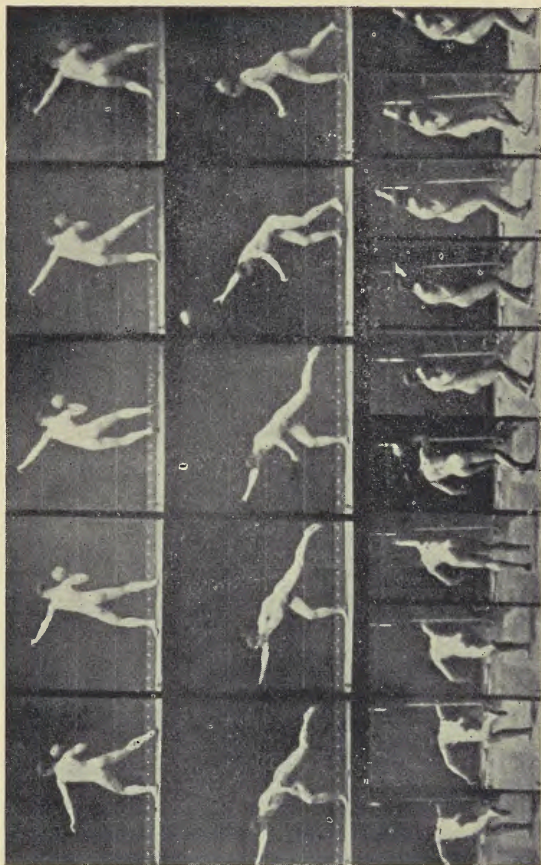
A fair example of the ordinary crude jumping novice—stiff at all points and not facing his front.

A fair example of the ordinary crude jumping novice—stiff at all points and not facing his front.



SERIAL STANDING JUMP

Side and front views—a lesson to many a long jumper in the upward fling of the arms, the final thrust forward of the legs and the pick up at the finish.



PUTTING THE SHOT

From a standing or second position. Note the low dropping poses at the end of the delivery. Head should be held upright on delivery.

herself, as the younger women of the day are by no means a negligible quantity on our athletic tracks) how true co-ordination of bodily movement may be arrived at.

Good running means easy running—and ease stands for action and speed. There is no surer way of “putting the brake on” yourself and retarding progress than by straining and struggling, with every nerve and motor-muscle at full stretch. A very great proportion of failures are due to trying to do too much. Most try to run faster than their own particular speed-limit allows. The result is, far too often, they do not get the best out of themselves. The sprinter, for instance, in a frantic effort to get every ounce, and, often a few ounces more, out of himself, goes all to pieces and is no faster over 100 yards when racing “all-out” than at three-quarter speed in a training spin. The half-miler should endeavour to know if he is going or being taken along too fast over the first half of the distance. It needs a nice judgment and no end of experience in running to the watch. The miler must learn his speed-limit, per lap, just as the 10-miler and Marathon men do. Even though he may not be, himself, aware of his lack of good style, his head being up in the air, his arms fighting upwards, and his neck and shoulders, chest and stomach being harshly stiffened, nevertheless the willing sprinter will not be a long time in feeling the difference of a fluent and effective manner of “using himself” instead of “going a blinder” from the moment

he hears the pistol-report until the race is over.

I do not think we can select a better type of runner for the bottom-speed example than the plodding Marathon man. Undoubtedly, he comes next to the walker and, as such, he will be wise to keep most closely in touch with the No. 1 arm-swing of the "three-speed gear," set forth in the chapter on Walking. The movement of the arms is not so long or so dependent on the elbow-lift as in walking. The arms should hang straight down inside the tops of the thighs and swing loosely in-and-out across the groins or backwards and forwards, unless, of course, someone or another here and there prefers the natural into-the-body arm-swing which, let me repeat, has no equal for all-round action, either in walking or running.

Having watched the performance of many Marathon runners, it has surprised me regularly to notice how so very few, irrespective of nationality, have made their running anything like as comfortable as they could have done. The real art of long-distance running, as well as road running, is to keep the footwork low to the ground. The minimum lift of the feet in the walking steps should be the Marathon specialist's greatest endeavour. Think of the unnecessary work done by a man who runs, say, from Windsor to London, and who lifts his feet too high! He makes, at a low estimate, twenty-two thousand strides. Think of it! Twenty-two thousand strides, and each time

lifts the body a few inches higher in the air than he need and lets it fall a greater height than is necessary. *Twenty-two thousand times!* Do you, my reader, realize the tremendous saving in effort (of raising the body off the ground) and the material increase in speed to be gained by the quicker and easier footwork, due to the feet having to waste less time and generally being eased of strain? It is, simply, a matter concerning the mechanics of the strain entailed, mingled with a certain amount of dynamics. One has to regard this question of the easiest and, therefore, best way of "journey-running," as it is called, from a scientific aspect to understand its full meaning. But, briefly, we may claim that the better the running style, the less energy expended.

Absolutely the most smooth and effective movement I have ever seen for covering long-distance, up hill, down hill, on the King's highway or across the fields was carried out, many a long year ago, by a company of the famous French troops, known as the Chasseurs des Alpes. Carrying enormous packs on their backs, stacked up to a point a foot or so above the tops of their heads, wearing their military overcoats looped open in front to allow freedom of knee action, they paddled along at a standard gait of 9 miles per hour. Their way of covering the ground was a cross between a run and a walk with the smallest perceptible amount of foot lift, the knees being always kept more or less bent. Their bodies were carried in a loose, half-squatting position, with the head and chin

dropped noticeably forward. The effect of this loose-limb, though heavily laden, company has never faded from my memory. What they showed me was the real thing. Very seldom, in the forty-four years that have slipped by since I used to go up in the little mountain villages around Grenoble (Isère) to buy cattle with my uncle, have I happened upon anything so sensible or so well suited to the job on hand. A few of our best runners have, more out of a natural instinct to do the right thing than by any acquired knowledge, run and walked in this flexible, yielding fashion of the Chasseurs. To my own way of thinking, their names deserve to be recorded. There is, first of all, the fastest sprinter who ever put on spiked shoes, Harry Hutchins; then one who came very near to him, namely, Harry Gent. Next comes George Littlewood and Charles Rowell; then the greatest all-rounder, W. G. George, who still holds the British mile record time of 4 min. 12 $\frac{3}{4}$ sec. He was a grand track man from the $\frac{1}{4}$ -mile to one hour's run, and a super-cross-countryman. Another is W. H. Coad, a remarkable little cross-country runner of the 'eighties, who used to do the long loop around the bottom of Clapham Common in plimsolls like a laddie trotting off to school, so easily did he go. Yet another is Dr. H. A. Munro, who was also notable for his supple carriage. Others are poor George Hutson, one of the grandest track runners, from $\frac{3}{4}$ mile to 4 or 5 miles; the sprinter, H. F. V. Edward, British champion in 1920-21 and '22 and

outrageously unfortunate, owing to a misunderstanding at the start of the 100 metres race at the Antwerp Olympic Games and a bad leg breakdown in the 200 metres. These men are the most notable specimens of the very easy and loose-limbed running style I can specially recall. I may add George Larnier, as a walker—"some" walker too—coming within the same class. That merry little sprinter, W. R. Applegarth, and another high-grade all-rounder, Albert G. Hill (double Olympic champion at Antwerp), amateur mile record holder of 4 min. 13 sec., also winner of championships at $\frac{1}{2}$ mile, 1 and 4 miles on the track and a great cross-country performer. All these had to make the fullest use of their splendid natural abilities before finding top-line pace.

Above everything else on the long journeys, and the medium and short ones as well, let your leg-work, your arm-work and the carriage be of the very easiest, that is to say, the least fatiguing you can make it. The 10-miles championship run at Stamford Bridge in 1923 provides a case in point. It was won by an undersized but strongly knit youngster from the North Country, named Harper. He beat the more set and seasoned, fine cut, lathy, leggy, feather-weight and rather high-actioned mover named Britton in a race which was one of the most interesting I can remember. Britton gained nearly half-a-lap in the first 3 to 4 miles. Then Harper began to cut into the other's lead. Stiff-armed though he moved,

and never giving his body proper support, Harper yet ran his man down, fairly hunted him for a couple of miles, caught him and sent him off the track. Britton lost every semblance of good form to an extent I have never known any class runner do. His hands were up to his neck and his head worked back towards his shoulders. Harper succeeded not so much by his own good running, as by grand determination and the other man's stiff action.

CHAPTER III

HALF-SPEED RUNNING

At half-speed, one should be moving in the best of shape and comfort. This is about the rate at which the longer distances, 4 to 10 miles are run. It stands for about $4\frac{3}{4}$ to 5 min. per mile to the good runners and, of course, correspondingly slower according to the quality of those engaged on these long runs. Once the runner gets settled down to his work, that is, when he has found his "second wind," as it used to be called, he will go round and round the laps with the regularity and certainty of an automaton. Until he does reach this happy state, a distance-runner should know that it is well for him not to over-exert himself. A good many people suffer from troublesome stomach and side stitches; they arise, mostly, from overstraining the breathing organs in combination with the circulation of the blood. The human engine, it should be understood, is in many respects like the slow combustion of the motor engine in its demands for a suitable working temperature and a fairly equal mixture of air and liquid to maintain the unhampered flow throughout the tubes. A temperature in the neighbourhood of 100 degrees is about the best for the great majority of athletes in action.

If only the distance runners would study themselves in their training spins by noting their feelings, say, at each lap and half lap, with the same care as they time themselves, they would soon get to understand to within a few yards of distance, and a second or two of time, when the "bad patch" is at hand. The state of the atmosphere will have something to do with the matter and so will the nature of the ground being covered. Up-hill and down-hill balances both tend to upset some men, while "heavy-going" favours only a very exceptional few.

In calling the moderate pace "half-speed" running, do not be led away with the idea that I mean exactly half the rate of movement of which a man is capable. What is known as "half-speed" means, in practice, the runner going at a very easy gait, say, the half-miler up to a 2-min. standard taking another 20 sec. for the distance or trotting through $\frac{3}{4}$ mile in 3 min. 35 sec. to 3-40, and a first-class miler doing 4-50 to 5 min., the four-milers reeling off their laps at 1 min. 15 sec. to 1-20, or around $5\frac{1}{4}$ min. per mile, with the ten-milers striding easily on at a $5\frac{3}{4}$ to 6 min. per mile rate. Please note that these times, as with a 6 min. to 6-20 per mile for the Marathon men, are for the good runner only. And if the good runner is wise and willing to "get fit" slowly, though ever so surely, he will do the bulk of his running practice to these very steady time-standards. He should back up his track or road runs with plenty of walking—

just good, easy, swinging walks, from one to three or four hours. If on the road, he should, circumstances permitting, take his walks on the course he has to race over. Walking is the greatest health-giving exercise available for mankind. To get the very best out of it, never go beyond three-quarter speed in your ordinary walks and not a lot above this when racing. The chief thing to concentrate upon is a long, smooth swing of the arms and to keep to straight-footed treading.

As regards style, the distance runner has three optional arm-swings. The two best are the in towards the body and the backwards and forwards movement of the hands, which are kept, or should be kept, by the hips or even as low down as in simple street walking. But the faster and more vigorous the running, so the hands will rise until they are working across the body, right under the stomach.

How much the play and pitch of the arms command the leg-action is known to those students who have applied it in the most practical sense to their experiments. Even those great athletes, W. G. George, Harry Hutchins and Albert Hill owed much of their success to this action.

In the case of Hill, after we had tried several arm movements, he gradually evolved a most helpful and simple swing that enabled him to steal along the ground with the minimum of exertion. What he painstakingly worked out was an adaptation of my old sprint arm-action, in which he had always been interested.

CHAPTER IV

MILE RUNNING

FOR quite a long time I, like many others, laboured under the delusion that the $\frac{1}{4}$ mile, run in a tight race among well-matched men, was the hardest, most severe and exhausting event of any. Now, however, I consider it to be the first-class mile, that is if it is contested by a set of determined opponents, each capable of registering round about 4 min. 20 sec. It is really surprising to what heights a good miler can rise, if the pace-making is a "real cracker" all the way through and the conditions, atmosphere and track, are favourable to fast times. When the pace is really hot and the first quarter return is inside the minute and the half-mile is a second or two outside 2 min., there are "bellows to mend" with most of the field, as the leaders go running briskly on into the trying and often demoralizing third lap. Only the very best and fittest of the field will be seen keeping up anything like their original pace. The second, third, fourth and fifth raters are being sorted out with the strictest impartiality. Time and distance are doing their work of classification and making it clearly known to all whom it may most concern that the "all-the-way"

mile stands for the ultimate survival of none but the best and the fittest. This is, indeed, a veritable fact.

As in the longer distances, the best form of mile running can only be achieved by accommodating one's training to the checking of the timing-watch. By dint of working to a schedule, night after night, on the Herne Hill track, Albert Hill got to know the pace he was travelling at so accurately that he hardly needed me standing, watch in hand, and telling him at what rate he was covering his two or three laps. To such a near approach to the actual readings of the watch did he get, that very rarely was he more than a bare half-second out in his calculations—and you can't cut it much finer than this when taking into consideration the chops and changes that come over the path and the weather. The consistency of his striding and his regular running, backed by a tremendous keenness and love for the sport, combined to make Hill a rare judge of pace and what he should do to get the very best out of himself.

Time and time again we have talked over the subject of mile-running and how to train for it so that a sound, steady time-schedule shall be the goal to aim at. This schedule must be accommodating and very faithfully adhered to. It is not intended for any ordinary stamp of runner, but for those who show the mixture of speed and stamina which is the gift of the elect. The art of running lap after lap as evenly to time as a mechanical engine

can do, if not too difficult a proposition, is certainly no easy matter. It will be mastered, though, by the expenditure of patience and determination to succeed. Without the sporting enthusiasm that urges one on to keep persevering, any such attempts are foredoomed to failure; for there will be days when some influencing factor will arise, caused, perhaps, by a change in the conditions, the presence of a new-comer, or the runner himself being above or below his normal standard, which will mislead him as to the times he is making. We all learn from our mistakes, and the mile-runner who sets out to try and get to know fairly well the pace he is moving at and how far this will carry him may, also, gain what he is in search of by giving all his attention to the probable reasons of his early errors. There is a saying that "A man who never makes a mistake never makes anything," and it is very true. Keep pegging away and endeavour to get some one as keen and interested as yourself to go out with you and watch the half-lap and full-lap times. If you have the time of the first lap called out to you it should be up to you, afterwards, to try and gauge your own gait and tell the timekeeper what *you* think it is, rather than that he should again inform you. At the very beginning it may be best, in some cases, to hear the lap times always called. Sooner or later, however, the runner must depend upon his own judgment, so he ought not to over-delay an independent forecast of what the watch reveals.

Having gone deeply into the matter of the most fitting lap schedule for the first-class miler and for those ambitious to get into the top class I can recommend the 62 to 63 sec. lap throughout a mile run, as being the most serviceable and sensible rate of speed calculated to bring out all the fine points of a crack miler. There is none of the bustling "inside a minute" first lap nor the searching 2-2 half-mile which leads to a falling away in the third lap, declared by that high miling authority, W. G. George, as the most exacting of all four laps in a mile.

The student should run in comfort; he should not over-reach on the stride, and he should carry the arms as in walking—his own everyday way of walking—in fact, the looseness of the street walk should be his guide. He should keep as near to the inside edge of the track as he can. Let him drop the inside arm, the one, of course, nearest to the inner line of the track, and allow some of his body-weight to incline in the same direction. This is an infallible remedy to correct the common fault of not keeping close enough to the inside edge and of going wide, whereby one may lose a yard or two at the bends. No one can afford to waste an inch of distance nor one hundredth part of a second of time. So, in training runs, we should see that our feet are placed as near to the inside edge as possible and the same in the races, or, at any rate, as near as the opponents allow.

Is it best (1) to go in front and cut out the pace; (2) wait on the heels of the leader; or

(3) lie back, but always within striking distance of your rivals? These are questions which every runner will, surely, be asking himself at one time or another. If he is a schedule runner, the lap times, called out by some dependable friend, will tell him what is wanted of him; but in the excitement and stress of racing there is always a possibility of things going wrong. Familiarity with your rate of speed is safer and rests in your own hands. The best place for the good runner is at the head of the field. He has to accustom himself not only to know his pace, but, further, to have the patience to "wait in front," and the same can be said of the runner with the extra turn of finishing speed to whom a slow run race, if the opposition falls to it, is his greatest hope.

In a fast run, there is no better place than to be nicely behind the leader, and be shielded from direct air-pressure, which may reasonably be estimated at equal to about 25 yards in a mile, or around 4 to 5 seconds in time equivalent. Given a fast finish, one may "wait on" the leaders from as convenient a position as can be gained and make full use of pace-making shields. All said and done, however, the crack miler, if he is capable of taking the lead right from the start, should do so. From that position he can run the race as he prefers it to be run. The rival he will have to keep his eye on is the one who jumps in behind him and trails him off into the last lap and then comes at him with a whole-hearted challenge.

Championships and fast times have been won and made by a strong, experienced man not letting himself go until the last 200 yards or so and outstripping those who have been doing what is known as the "donkey work" in the earlier stages. *The mile is, undoubtedly, the hardest race of any where the first-class and well-matched runners are concerned.*

Middle-Distances

At one time of day, the $\frac{3}{4}$ mile and 1000 yards races were far more popular than of recent years. They brought to light a very interesting type of competitor. Usually he was the half-miling enthusiast essaying these longer journeys against the actual miler. The superior stamina of the latter, when he chose to let himself go "all the way," and run the middle-distancer off his legs, was generally the deciding factor in the struggle. Very instructive were the old-fashioned "compromise" races, in which a miler would tackle a half-miler at $\frac{3}{4}$ mile and a quarter-miler meet a half-miler at 600 or 700 yards. Let it be known that all these middle-distances come within the scope of the accomplished miler, who has to be blessed with a mixture of speed and stay. Therefore, it is fairly true to say that the first-class miler is pretty well master of the middle-distance situation, from half a mile onwards. Exceptions to the rule will occur when a sound quarter-miler develops, as has happened before now, and challenges comparisons with the best stamp of half-miler.

Half-Miling

This is a special class of race, frequently at the mercy of some one or other, who, if he had sufficient patience, could husband his necessary turn of speed and leave his opponents "stone-cold." Such a type of speedy stayer can afford to wait until the last fifty yards of his race remains to be covered. I wonder how many championships I have seen lost by reckless, impatient runners! The thought of "waiting on" their men could never have entered their heads. Patience, backed by a very intimate understanding of the pace you are moving at and the amount of reserve you have stored about you is a leading feature of the half-miler.

"Man, know thyself!" is a quotation deserving the closest consideration of the athlete. But if any class of runner requires to know himself it is the half-miler. Above all else, he has to find out the pace which is most favourable to his own running in the first half of the journey.

If he is capable of "cutting it out" and lasting through, he will have done all he can to take his rival's sprinting finish away from him. It may be "bellows to mend" with both of them at the three furlongs stages, but he has to get home as best he knows how, pushed as he probably will be to exert the very last dregs of his strength. To fit this part, he needs to be a very useful sprinter, no end of a smart quarter-miler, able to stay out the

half-mile and as fast as anyone in the finishing burst. The better stamp of middle-distance men modulate the pace of the first half of the journey.

That fine half-miler of the old days, E. C. Bredin, who waited on the American champion, Kilpatrick (holding a record of 1 min. 53 sec.) and "left him standing" in a very memorable match at old Stamford Bridge, could never get through a "half" if taken along at anything faster than 60 sec. for the quarter-mile. He was, actually, equal to $49\frac{1}{2}$ sec. for the "quarter," which was undoubtedly his most suitable journey. All the same, by judicious running for the first 440 yards and keeping as near as he knew how to a 60-sec. gait, he would then cover the half-mile in just about 1 min. 55 sec. To do this time he had, of course, to run the second 440 yards in 55 sec, a rate he could make well. Judging by his freshness at the end of the races, when he ran to the easy first-lap schedule, he would have improved upon 1-55 had he been required to do so.

The "Quarter"

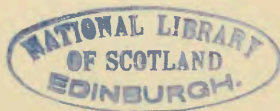
By common consent the quarter mile is recognized to be one of the toughest running propositions, demanding not only speed and stamina, but also calling for judgment of pace and the place on the track that will serve one best. At one time the "quarter" was run at a modified rate of speed, not unlike a half-mile, but the phenomenal American, L. E.

Myers, endowed with the longest legs for his size, carrying a light, small body, taught us how to run it in far faster style, and he himself did it in $48\frac{1}{2}$ sec. I can see him now, in my mind's eye, his head swathed round with a handkerchief, in Indian fashion, bounding along like a ball. Good as Myers was, however, we had some one born and bred in Old England who could "clip the wings" of all-comers. I am alluding to that masterpiece of pedestrianism, Harry Hutchins, who ran a private trial with Myers. They ran 400 yards, Myers taking 10 yards start. Hutchins caught Myers before 150 yards had been covered and started talking to him. There they were, the two extremes of running perfection, Hutchins nearly 5 ft. 11 in. high and weighing (stripped to the buff) 12 st. 8 lb., "creeping" over the ground with the inimitable low 7 ft. 6 in. stride, and Myers, well below 9 stone and standing about 5 ft. 6 in., the "good big one" and the "good little one." After that illuminating run, Hutchins challenged Myers through the sporting Press to run any distance up to a quarter of a mile. Myers took no notice of the challenge, although a match between this pair of celebrities would have drawn all sporting England to see it. His spoken comment of "Hutchins wants a box of toys to play with," tells of his ideas upon the subject.

An all-the-way long sprint, and "the devil take the hindmost" became the fashion in quarter-miling after the Myers era. It is most necessary on an oval track like Stamford

Bridge to get away at the start for two very good reasons : (1) to get clear of the dangerous rush and scramble at the first corner ; and (2) to gain the lead which will mean gaining the nearest road round to the winning post. Having taken the lead, one may ease off the snappy sprint action and, assuming a more upright pose, obtain a longer and freer leg and arm swing. A runner can assist himself considerably in moving round a bend of the track by dropping the inside arm and throwing some of his weight in the same direction. In "bend-running," too, one moves as speedily and, of course, under less exertion at the three-quarter pace as when putting "all in." The very quick starting movements should, therefore, be changed once a runner has gained the corner. Whether he is leading or striving for a clear course in these early stages of the race, it is a wise policy for any but a real top-class man to slightly check speed and adopt a smoother, longer stride, and conserve as much of his energies as he is permitted to do by keeping within handy length of the leader, who must still be rattling along at a merry rate, for, if he slackens too much, some one will cut him out of the invaluable first place in the clump of racing figures. If anyone has to be watchful and determined to hold on, it is the leader. No one is more alive to the fact that he is being trailed off by a pack of very earnest rivals, each waiting the chance of supplanting him.

As a rule, there are no very special develop-



ments occurring during the passage of the first bend. But it is to be likened to the calm coming ahead of the storm. As the leader reaches the back-straight, he will need to hustle up to something approaching his long-striding top-pace as the struggle for positions is recommencing anew. He must hang on to his lead now or be unceremoniously swept aside, passed and shut in, almost as surely as though a door had been slammed right in his face. And it has, actually, happened!

The second vital phase of the race is in being. The original pacemaker has lost his place. It may be, moreover, that the new-comer is himself supplanted, as the chops and changes of a thoroughly hard-fought "quarter" can be many and thrilling. A "flyer" of the best breed can be in front all the way and win, as I have seen them do, "with their heads in their chests."

In the last 50 yards of a "cracking on all sail" quarter-mile comes the tug-of-war. Possibly, a wily runner has waited with the patience which has earned more than one championship title at this distance. Letting the foremost of the striving band run themselves out, he comes from their midst and leaves them all struggling and gasping to keep with him as he sprints "out by himself" to the finish. But the race of races is seen when three or four runners are locked together in tense fight to be first on that white line of worsted beside the cluster of officials at the winning-posts. Ever so far away the goal

seems to be and the fight to be first there is telling hard on them all.

The whole field is within a near point of being run to a standstill. Now it is that the slightest bit of good technique can lend invaluable aid to the one who knows how to bring it into play. Ah, look at that runner in the pink vest! He has dropped his arms and brought his head to a more forward setting. As he does so, he begins to draw in front. He has eased off the strain of an upward bearing and, by so doing, saved himself, say, 25 per cent of misdirected energy. His changed body-balance is winning him his race from others as well-fitted as himself to "deliver the goods," if they had them in stock when they were most urgently wanted. These are no fancy pictures I have painted. They are, indeed, just a recital of phases of first-class quarter-miling I have, in the course of a long career, seen enacted upon the track.

Absolute bodily fitness is the great essential for the "quarter" to be derived from plenty of long sprints from 250 to 350 yards.

CHAPTER V

GENERAL

The Long Sprints

The favourite distances of 300 and 220 yards are comprised under this heading. Both will be found within the compass of very exceptional sprinters and, generally, of the leggy, upstanding kind, although one of the very best runners I have seen over the longer journey was very much below standard in height, weight and scope. He was one of the exceptions which go to prove a rule. First-class he was, all along the line up to 300 yards, and I saw him get a quarter-mile as though he liked it. The runner mentioned, Joe Rooney, could give that truly wonderful little sprinter, W. R. Applegarth (the very best 220 yards runner I ever set my eyes on) a race, if not quite able to beat him. At 300 yards, a length beyond Applegarth's best running, Rooney was "something to write home about."

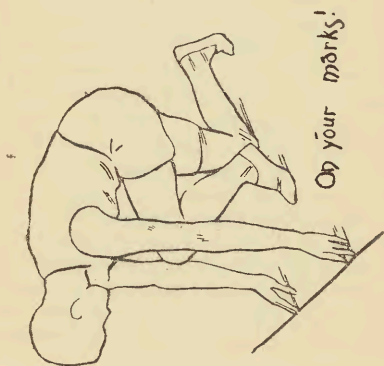
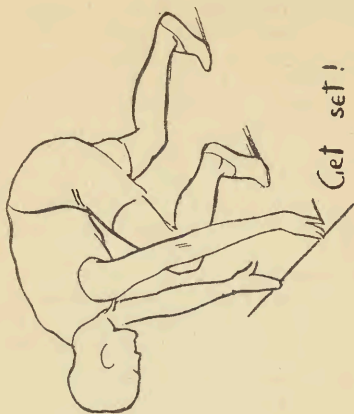
The long-distance sprinter has time in which to take an "easy" and shake out a less exacting stride than he must use at the short sprints. Many 220 and 300 yards runners do their races in two patches, putting all-in for two-thirds of the journey; then, taking a pull at themselves for 25 yards or so and working

up to their limit again at the further end of the race. In every other respect, the formula for the long sprints is precisely the same as for the short ones. This does not allow for the opportunities which crop up for the use of a certain amount of generalship, more serviceable, perhaps, in handicaps (where the back-markers have to find a way through or around the recipients of start) than in scratch races.

Pure Sprinting

I will now deal with what I consider to be one of the most difficult forms of athletics to instil efficiently into anyone. But, first of all, let me say that the word "sprinting" was originally imported from America. It was, no doubt, suggested by its old-established English predecessor, "spurting," so highly descriptive of speedy action.

The man who lays claim to knowing all about short-distance running or sprinting has a good conceit of himself. I have seen most of the star sprinters, tried to fathom the secrets of their remarkable pace, read all I could lay my hands on that dealt with this complicated form of letting loose compressed energy, have been a moderate performer myself, and stood as guide, philosopher, and I hope friend, to not a few of the very best of them. But dare I say, in calm confidence, that I know all about it? The whole thing is vast and very much complicated; but the underlying factor which allows a man to gain speed depends upon the



possibility of the human frame delivering its locomotive actions to the best advantage.

The proper carriage of the body, with the most effective disposition and service of the arms and legs is not difficult to arrive at. Many styles and mannerisms rise up before me. In very few cases have these enabled their users to get to the bottom of their speed-box. My own tests have exposed the fallacy of the up-and-down chopping action or long upward swinging of the arms, such as is now practised. If those who recommend this *up to the shoulders and down to the side* arm beat could be persuaded to go and put such actions to the practical test, we should hear a lot less of the system. For the great mass of human beings there is nothing so comfortable or a greater aid to speed and balance than the inward swing of the arms. The ordinary walk sees the fore-arms lightly swinging in-and-out across the hips. Moving at a jog-trot, the arms still work in and out, but they make a shorter and quicker beat—for the faster one runs the greater is the need for quicker arm-action. These are sound and solid facts and not supposition, to be easily checked by all willing to take the small amount of trouble entailed.

A good example of the natural and helpful *across-the-body arm-swing* is to be gained from race-walking. Remember this: a walker has to do just what the chief task of the runner asks for, namely, to carry his "dead-weight" (the head and body) in the easiest and speediest

manner. The walker has to do exactly the same work as the runner. As was pointed out earlier, running is simply a "forced" walk, and there is the closest connection between the two forms of motion. So, if the inward arm-swing is good for the walker, we may well accept the inference that it is, also, good for running. Is it as helpful in running as in walking? I go so far as to say that the *inwards across-the-body arm-swing* is of even more value in running than walking. Why am I so sure about it? Because I can prove, at the walk or at the run (jog-trot, medium or top-speed), how those who use it, not only give themselves the opportunity of working their limbs at the topmost possible limit of speed but, in addition, move their bulk of "dead-weight" along with a minimum of effort. Facts are very stubborn things, and they have a happy knack of eventually worrying through on their own account.

Sprinting is running at top-speed; but it is safe to say that most sprinters would do no worse, and often a good deal better, if they kept the pace a little under full-speed, which gets so many of them straining and struggling and out of all proper body poise. To run smoothly forward with the upper part of the body inclining to the front is the real secret of good sprinting. Style and form count for such a lot. May I tell you a story of one of the old professional school of sprinters? This man, like ever so many more of his species, was finding it a very difficult matter to make

much improvement on his natural pace. To accord with his straightbacked and stiffnecked pose as he dashed up or down the cinder-track he was nicknamed "the soldier." For two whole years, although at it all the week round, try as he would, he could not shake off his habit of holding himself upright in very fast running. One day, though, the secret came to him. It was revealed to him not a day too soon, as the man who "found the money" to keep the sprinting school going had let it be known that upright runners were of no use to him and, unless an overhanging position of head and shoulders with the hands held low and round about the waist line, were substituted, "the soldier" must strike that camp and seek other quarters.

By a prodigious tussle with his physical and mental self, supported by a head and body lean few will improve upon, "the soldier" gained a triumph of "mind over matter" and at once proved himself to be a 3 yards faster runner than he had previously shown. He changed from a "half-second" runner to 2 yards over "evens." Never looking back from the hour he cast off his faulty upper carriage, this same man kept improving throughout a long career until he became one of the most stylish and fastest sprinters of his time. I tell this story because so many promising runners fall into a groove and stop in the second and third class when, by trying to improve themselves in studying good theory and converting it into regular practice they

may take that gratifying step forward into a superior class.

The advantage of being a quick starter cannot be over-estimated. Unless one keeps his mind on the further end of the track and takes no notice of his opponents or gets "out of the holes," at least as fast as any of those taking part in the race, he is liable to undergo the unpleasant experience of being "dragged off his legs," or, in other words, he will struggle to run at a faster rate than he is capable of doing. More unsatisfactory still will his plight be, if, as I have known hundreds do, the progress of the fastest "beginner" is watched. Turning the head ever so little in a sideways direction upsets a certain amount of balance and spoils the true line of progress. Then there is the "listener," who knows altogether more than he ought to do of the details of his sprint, owing to letting his thoughts stray on what others are doing. This fellow is, really, worse than the sprinter who turns his head round to get a sight of how the opposition is going. There are dozens of sprint races lost every athletic season owing to competitors looking across or behind them, or allowing their thoughts to be detached from their own running. For a sprint to be properly accomplished means thinking only of your own running. You must concentrate upon yourself, if you wish to get to the worsted in the minimum of time. Take a sight along your string when the race is about to begin, and on the starter's intimation, "Get to your marks," think of

nothing but the tape. Keep it in mind. Even though your eyes are shut you will know where it is. And at the "bang!" of the pistol take no notice of anything or anybody but just go like a flash for that worsted. If you know your business at the finishing end, and you are carrying yourself somewhere near about correctly (may I repeat, *with head and shoulders in advance of other parts of the body and the hands working the "horizontal swing" across the body?*), you will rather let your head and chest fall on to the tape for the classical finish than attempt that ridiculous and dangerous jump at the tape performance.

Which is the best American sprinter I have seen? Not a shadow of a doubt about it: he was one, Howard Drew, a mulatto, and the finest, prettiest-built cut of a runner I'll hope to see. He was a picture runner, such as you dream about coming your own way some time or another. Drew outclassed all the sprinters at the Stockholm Olympiad. The first heat I saw him race in, he came trotting through to win at his leisure. Looking at my watch, I said to myself, "He'll run half-second faster than this and still have a bit in hand." But Drew had no luck; though he won his second round, he had to be plastered and bandaged all up one leg and was, in consequence, far too lame to turn out in the final heat, and he had to leave that race to others. We lovers of a grand sprinter were left to imagine what might have been. Drew was not the only American; for I recall a stocky,

but good little sprinter, namely, A. F. Duffey, and another named Brown, who came here two or three years ago, to carry his hands low and work them in and out across the pit of the stomach.

I always liken a well-run sprint to a long parabola, in the formation of which the runners go down at the start, then gradually rise to their proper positions and dip down again at the finish. But how seldom do you see them, even the finalists in a championship, running and shaping themselves to the true demands of the race? As a rule, it is very rough, hard straining which makes them get almost straight up at the start and causes them to lift their arms a lot higher than is necessary or comfortable. Finally, it takes them into the worsted with the upper portion of their bodies held back away from the direction in which they are travelling. This is downright bad running, which one never saw practised by such crack men as W. R. Applegarth or H. F. V. Edward. These are remembered for the ease and smoothness of their actions. Where did they carry their hands? Why, across and at the pit of the stomach and moved by in-and-out beats.

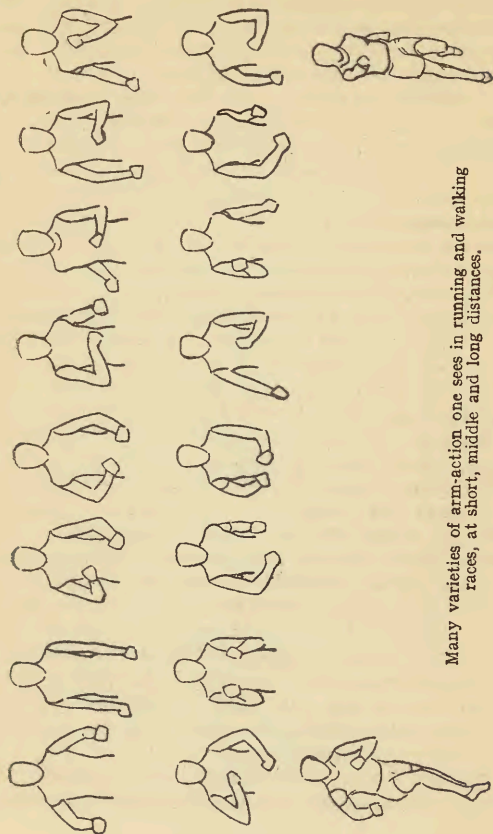
To think of sprint running as nothing but a forceful effort depending upon the individual's physique and sheer brute strength is hopelessly wrong. The really polished sprinter can, and should, go through his race at the utmost limit of his pace as lightfootedly and as supple as a racing whippet bounds along

with his body flexibly stretched out. We admit that speed is the one item by which a race is judged, but it is by no means the one item that wins the race for its victor.

I have heard and read in books, written by men of high reputations, that a sprinter should take a deep breath as he goes down in his "holes" and not breathe again until he is halfway on to the winning-posts, when he can discharge the foul air within him and gulp down a second dose of God's fresh mixture of oxygen, hydrogen and nitrogen, which ought to last him to the end of the race. Then, I suppose, he may breathe for the third time.

What rubbish it all is! A sprint runner's regular breathing is, if anything, more vital to him than any other type of runner. We will admit he is "under forced draught" all the way. It is, however, physically impossible for him to move fluently and easily (as a crack sprinter will do) if he is suffocating himself by holding his breath. To run as any normal being must do to avoid strangulation and tension of the very parts of him he should carry himself in an unlocked manner, he *must* breathe as Nature calls upon him to do. The air has to be pumped in and out of the lungs at each stride. In the passage of the air through the mouth and nostrils the quick-actioned sprinter will be heard whining, sighing, screaming, grunting, whistling or wailing as he performs his laboured breathing.

Well up on the toes to "demi-point" (as the toe-dancers term it), using the knees



Many varieties of arm-action, one sees in running and walking races, at short, middle and long distances.

smoothly and rapidly for the upward stroke, yet controlling them so lightly that they fall to the ground of their own accord or by "gravity," using the thighs at about three-quarter elevation and working right from the top of the hips, maintaining the body in a supple condition, the arms picked up and the elbows squared-off to restrict the length of the arm-swing and used under the direct guidance of the shoulder-blades, with the head and shoulders set loosely over in the direction taken; these are the very best actions for a sprinter who wishes to gain perfection.

What sprinters and sprinting coaches appear to overlook is the necessity for speedy action. It is not the length of stride so much as the quick movement of the arms and legs, assisted by a swaying of the body, which secures the victory.

Relay Racing

As usual, we have to go to America for our best examples of relay races, although a few select teams, notably the Polytechnic Championship quartet of pre-war fame, have contrived to hand on the baton to good takers, both the givers and receivers making fairly efficient use of the ground at their disposal.

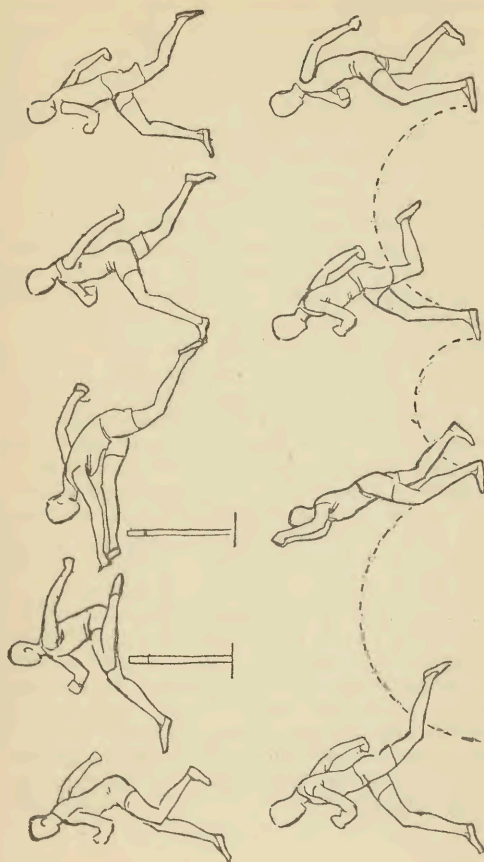
The baton, we recommend, should be carried in the left hand while the receiver waits on his mark until the team-mate he is to receive from is close upon him. Then, according to the class of runner coming to him, the one who is to receive the baton starts moving for

the limit-line, for there is an allotted space, which has been as long as 22 yards and as little as 10 yards, wherein the receivers of the baton can get on the move. The sprinter need not be looking behind him, but he waits on the mark until he gets a call, which will be given as the in-comer reaches within 6, 7 or 8 yards of the starting-mark. He should not look behind but should just keep a hand wide-open in order to snap up the baton. All the time he keeps a watchful pair of eyes upon the limit-line. But if the baton carrier is leg-weary and in distress, as he will often be after a long run, then the receiver must stand and wait for him.

The Hurdlers

This is, at once, the prettiest and probably the most difficult form of foot racing. We had good "timber-toppers" in the old days who held their own with the best from other countries until the great American, Kraenzlein, came over here with his "straight front-leg," or, at least, partially straight leading leg, and upset our insular notions of what was the most effectual and swiftest methods of stepping over the 3 ft. 6 in. hurdle erections. I must lay stress on my remark that the performance of clearing the 3 ft. 6 in. hurdle is, to all intents and purposes, a step over. To jump it is to waste a precious moment which, multiplied over the ten flights of hurdles, may mean so much as a full second's span.

The beginning and the end of the art of



Top : Five movements to "over the hurdles."
Bottom : The hop, step and jump in practice.

hurdle-skimming, for this is really what it amounts to in first-class practice, is to get from one side of the hurdle to the other in the shortest space of time. No doubt this is almost too obvious to mention. All the same, it is the nippiest and cleverest hurdler, the one who supports his fine practice by a cool, clear head and the power of great concentration, who wins hurdle races. If it be his good fortune to have a useful turn of sprinting speed, then he may easily be the ideal exponent of the game. As I have often said, give me the finished hurdler and I will take my chance as to his pace—in reason.

There are two standard styles of modern hurdling. Both are dependent upon a long leg and much flexibility around the hips. The very tall and leggy kind usually step over with the knee of the leading leg well bent. In fact, their action is the same as that used by an ordinary person in clambering over a stile. That it is a perfectly natural action is easily to be seen. But only the very biggest of the hurdling men can cross in this manner.

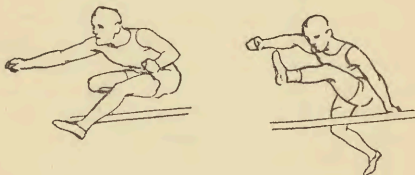
To those whose physical gifts have not granted them abnormal limb-scope and weight, the snappiest lead at the hurdle is gained by an almost stiff straight front-leg and a long stretch-out such as a greyhound or steeple-chasing racehorse will reveal in clearing obstacles and jumps. They need to be very active and to be possessed of some of the springy action which is owned by the jumping variety of athlete.

Whether the hurdler be very big or of medium build he should bend the head and body down as close as possible to the front-leg when he rises at the hurdle. This is because the lower the pitch of the head and body the closer will the man keep to his hurdle. And it is golden counsel to the would-be hurdler to warn him to keep down, like a horseman when his mount is rising to a jump. But though it is necessary to keep the body crouched when mounting the hurdle, a more erect pose on the way to earth is advised. This change of poise prevents an overbalancing just when the earth is reached, a thing likely to happen when the leading leg carries more than its fair share of the body's weight. To avoid this decided check to progress it is the custom of the best to allow the head and body to regain something, but by no means all, of its normal pose. The head and body angle must still be forward, poised as a stylish sprinter would have it.

This raising of the upper-structure has a great deal to do with assisting the back-leg to make a smooth, safe clearance, so that a stumble is prevented. If the hurdle is being stepped over and not jumped, the thigh above the back-leg will be at the top of the hurdles when the leading foot approaches the ground. This is the critical moment and ever so much depends upon the action of the back-leg. It should not be held bunched together, as is so often recommended, but made the fullest use of. The freedom and length of the back-leg

movement can only be applied by giving it full leverage and play.

Three strides between the hurdles and a half-hearted run-up to the first flight is the general custom; and the "3 between" is not so terribly difficult to the long-legged kind and by no means impossible to those less physically endowed. For those, however, who by Nature's limitation have "to jump 'em," then it may be a necessity to go a step or two further and practise whether a set of 5 or 7



American and English hurdling styles.

strides between the obstacles will be most accommodating to their requirements.

Of late years, "low hurdles" have come into a certain amount of favour. I have nothing to urge for or against them. My sole comment in their connection is merely to recommend them to the "hell for leather" type of speed runner who should waste no time in learning how to hurdle but just to get over them sharply and without thinking of their existence.

That saying, "A little more and how much it is," may well rise up in the minds of those

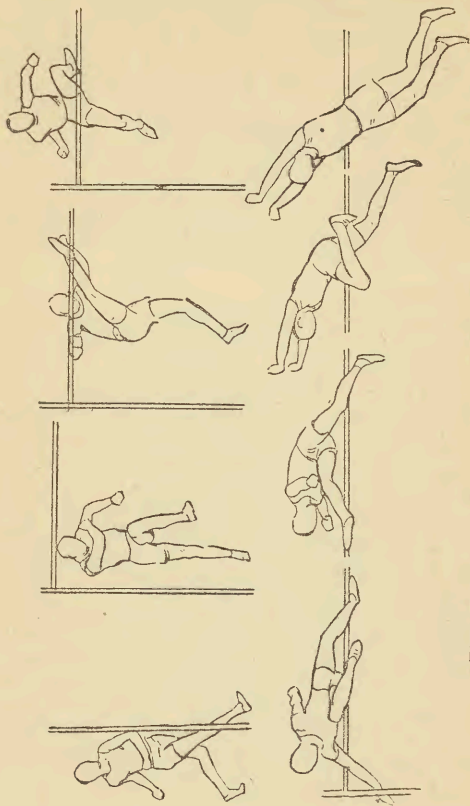
enterprising spirits who attempt the dignified and very exclusive "high hurdles" after a brief but flattering career over the 3-ft. structures that do duty in the quarter-mile hurdle race. "Only six inches more," I've heard them say. But what an enormous difference those six inches make!

As regards carriage of the arms there are several styles, the most prominent of them being represented by the action-pictures of the Canadian, American and English champions shown on the opposite page.

High Jump

A fine, natural exercise which displays the human form to great advantage. The creeping, crouching run up for the spring to the cross-bar or the bounding knee-lifting strides thereto are recommended before other methods of approach. At the same time, the high-jumper must know the length of the run-up which will get him to the handiest spot where his taking-off foot goes solidly down from heel to toe and shoots its owner upwards to take all the benefit a good leap can give him.

Ordinary high-jumping is a very crude performance when the "scissors" method of clearing the bar with a fairly well-shaped leading leg, a completely upright body and a dragged over and helpless sort of back-leg, are indulged in. This so-called "scissors" jump is like a bad hurdle clearance. There have been some grandly gifted jumpers who have, in this primitive style, cleared the bar at

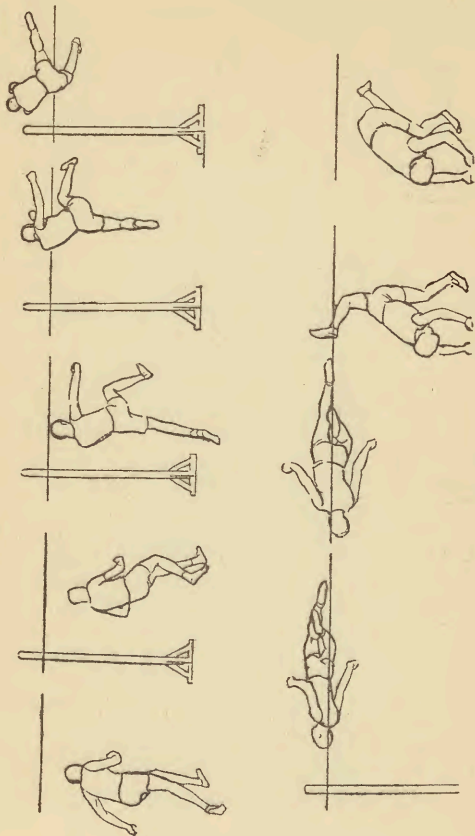


Eight phases of a high-jump, by the French jumper, P. Lewden.

around 6 ft. But all the very best jumping of the unmethodical kind has come from very exceptional men who have gone straight at the centre of the bar and rising from a long way short of the posts, often 3 to 4 ft. away, have gone over with a flying double-footed leap, not unlike that of a deer, horse or dog.

While allowing that the big double-footed jump has proved best for a notable few, the "scissors" plan of crossing the bar does not allow the jumper who practises it to make the utmost use of himself. Instead of landing on the leading leg, as the "scissors" exponents do, the American high-jump specialists discovered and perfected a far more efficient method. They found that the high jumper could get over anything from 6 to 12 in. above his ordinary jump by cultivating a turn in the air, made at the top of the lead—right above the bar—which had the effect of causing the jumper to come down to the ground on the leg he had "taken-off" on. The leading leg had been employed to get as high as possible and to carry the weight of the body with it, which leaves the taking-off leg complete freedom until the moment when the upper leg and body reach the top of their flight. Only then does the back-leg leave its hanging-down position and it is brought up with a turn, a twist or a roll-over, according to the inclinations of the jumper.

A great feature of the American jumping is the flat "lay-out" above the bar when head, body and legs are all in horizontal line,



The American rock-over style.

or nearly so. This is the supreme instant of the clearance. The jumper uses his arms and his legs, with all the power at his command, to get the taking-off leg under the upper leg, which at the same time is kicking upwards and outwards to stay the body as long as possible in the air. This last is to enable the jumper to do all he can to help himself over and squeeze out the last fraction of an inch of height. The arms help considerable in the leap while spreading out; also when the last efforts are made to derive the most of the turning, twisting or roll-over movement.

Long Jump

This is a complete contrast to the high jump, as here one aims at gaining length, which, let it be understood, is assisted by the jumper reaching a moderate height—anywhere from 4 to 5 ft. in the air. The long jumper must get well up in the air to carry him through the long parabolic curve which he executes in the process of his jump. As elevation has so much to do with the lengthening of the range, the aspiring long jumper will be well advised to concentrate on this important detail of the exercise; he should also practise a set run-up to the take-off board which will put him on there to a nicety.

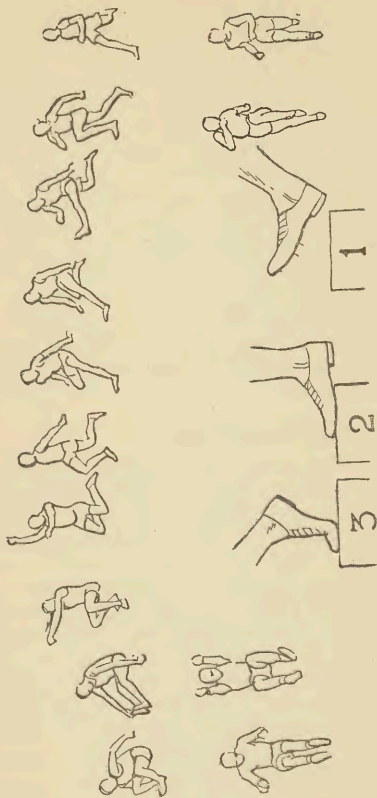
The "run-up" gives the jumper his initial velocity. The faster his run, provided he keeps himself under good control and only lets himself go right out about a dozen yards away

from the board, the better will be the jump. He will be helped in his flight by getting high up on his toes and lifting the knees with a bounding prancing action and employing the square up and down chopping motions of the forearms to encourage an upward lift of the body. A "slow motion" series of long-jumping pictures will explain the practice of this popular branch of jumping. From the run-up to the take-off, the rise in the air and the descent to the pit are well illustrated by the pictures (on the opposite page) of this 24-ft. long-jumper.

No better exercise is possible than hopping about on the "taking-off" leg, holding the other leg up with the knee and the thigh at right angles under the body. For the arm and shoulder developments, we suggest a pair of old-fashioned non-grip dumb-bells held in the hands and raised (both arms used) straight out and on a level with the shoulders, like a pair of wings, then high up in the air. For the stomach muscles and the loins no exercises are better than the "Cobbler's dance" (or Russian dance), lying on the back and lifting the legs above so that they go through the leg-thrust of running and cycling.

Hop, Step and Jump

This is an extended form of the long jump in which the performer first makes a hop, then takes off and descends upon the same foot; he next steps out on to the other foot, and finishes by taking a pronounced long jump.



Brilliant long-jumping serial, and how to foot the taking-off board.

Again, the need of a carefully measured run-up to the take-off board is a vital one. A 25-yards run is ample, as now one has to be careful not to overdo either the hop or the step. For example, the hop should not go beyond 16 to 17 feet with any but a very exceptional man, since too great a length on the opening movements will hamper the later ones. There should be a known best length of both the hop and the step to bring the athlete into position for the finishing just in order that he can tackle it feeling easy and not with the overstrained feeling which comes from doing too much at the hop or the step or both.

The proper use of the arms is, again, a source of tremendous help to the hop, step and jump men.

The Standing Long Jump

This is conducted on precisely similar lines to the ordinary high and long jumps but is taken from a standing position. One may lower and raise the body by levering the feet up on the "ball" and on the heels, but the jump has to be made without these aids.

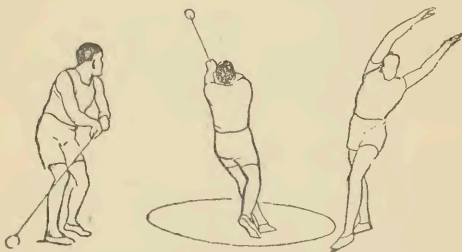
At the "standing high," the throwing up of the arms to their elevation and letting the body follow them as far as it can, and a violent "one-two," the upper leg and lower leg being very quickly and powerfully "kicked" in their turn (the one immediately after the other) under an uprightly held body comprise the formula of the "standing high."

By contrast, and setting a lesson as to the

different issues arrived at in high and long jumping requirements, the "standing long" demands a forward poise while preparing for the spring from the board and more forward still, even to the degree of an overbalance in that direction—as the set of "pictures" (in the art section) covering this attractive, if rather rare, exercise will convey.

The Hammer

This is one of the throwing feats which calls for a blending of knack or technique, a supple



The start, centre part and finish of a hammer-throw.

frame, much activity as well as considerable height, strength and reach. Actually, as I rate the feat of throwing the hammer (or, rather, heavy metal ball attached to a length of wire), it is the rotary movement of the shoulder-blades that reveals the merit of those few enthusiastic spirits who specialize in this strong-man act. No stiff-shouldered athlete, nor anyone who gets his muscular system

" tied-up " (a state of things far more common than may be supposed), can hope to shine at this spectacular field-event.

The way the hammer-sliding enthusiasts whirl the wired ball into a high state of momentum as they go from one side of the throwing circle to the other and then release the missile with a smooth upward double-handed lift is fine to watch. The timing of the discharge is one of the chief points to know thoroughly. Otherwise, the pathetic sight of the hammer throwing the man is not unlikely to happen.

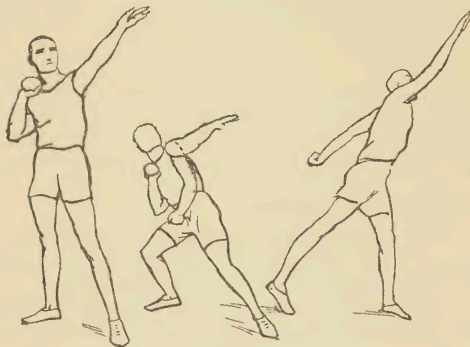
From what I have seen of the sport, I think it would make an ideal exercise for other branches of athletics, especially when men are muscle-bound, provided that a very much lighter " hammer " were used.

Putting the 16-lb. Shot

Weight and strength are grand assets in the composition of the shot-putter. To obtain the best results from natural gifts, one needs to be very expert within the 7-foot circle from which the cast is made. Speed and correctness in handling the shot, lissomness and co-ordination of all parts of the body, head, legs and arms, all have to be carefully inquired into to aid the final delivery. In this way alone can the putter hope to make the most of his cast.

In my opinion, largely derived from experience gained in throwing a cricket ball, I feel sure that much help is to be derived from a

better and more natural play of the arm and hand. The disengaged arm is pushed stiffly and straightly out from the shoulder as the putter stands up to begin his preliminary action for setting himself in motion before going across the ring. At this stage, the lifting of this arm helps to maintain balance.



"PUTTING THE SHOT"

First, second and final positions.

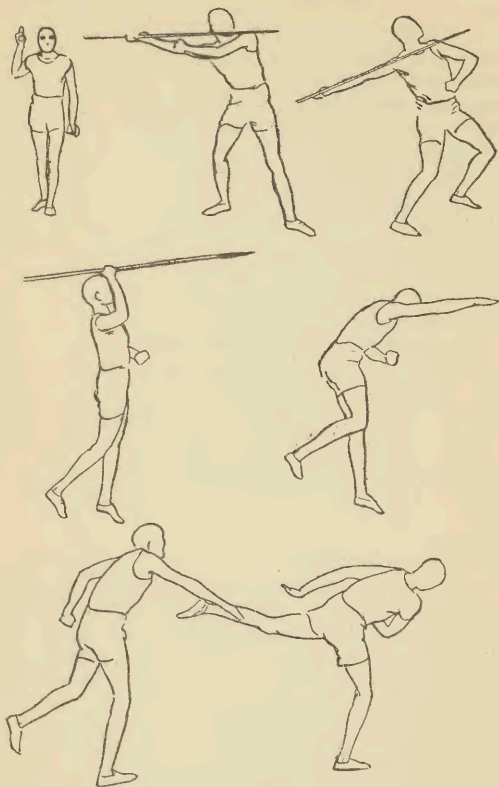
In effect, the putter takes two leaps across the circle. The first of these ought to see him come to a limp, drooping position with every part of him inclined to the side where the shot is lying. His head, outer leg, and body should be turned well round and the other arm (the non-putting arm) dropped low down across the body and almost under the shoulder of the putting arm. Then, taking a second and

rising leap, the putter must straighten out to the line of the put and time *exactly* the movements of head, arms, body and legs to act with the putting hand. Neither the head nor any part of him should be to the front, but all coming there together, until the shot is leaving the hand.

Most of the putter's power comes from his foot-grip. Therefore he must be well shod. He must try for reasonable height and not hold himself stiffly at the finish of the put. Rather let him drop limply to the ground and swing in the direction of his first position. This action will save him the annoyance of going beyond the limits of the putting circle.

Throwing the Javelin

Throwing the javelin is one of the picturesque items of an athletic programme, demanding the application of the nicest technique. It is a performance much allied to that of simple ball or stone throwing; but in each case, there is a basic difference; yet in all three similar characteristics must be developed, especially in assuming a loose and supple attitude so that the fullest strength may enter into the delivery. The run-up to a javelin throw has no need to be made beyond half-speed. If the thrower goes too fast or has not the proper time, he may not have sufficient space to deliver the missile without crossing the boundary line, and this will lead to disqualification. The finished javelinist discharges his missile a javelin's length, i.e. about eight



Throwing the javelin in seven actions.

feet short of the line, so as to allow for the forward impetus it gives to the body, but only if this is loosely controlled—both before and after the throw. In all respects, the javelin thrower conforms to the attitude of the shot-putter as he shaped himself for the put and all parts of him are in line in the direction of the throwing-arm. Javelin throwing asks for a limply dropped wielding-arm so that the hand drops down as low as possible, and, may I repeat, everything about the throwing should fall back to the same backward direction and concentrate, though very supplely and loosely towards the low-lying arm.

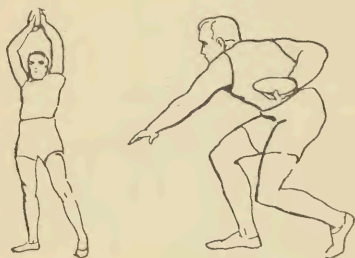
The javelin may be raised with "an exercise by numbers," 1-2-3. First, it is lifted to the No. 1 position, then raised to No. 2 on loosely bent arm at the rear of the shoulder; and finally discharged at head-level. Apart from the throwing-arm overhand action there is much about the foot-work resembling that of the shot-put.

Throwing the Discus

Throwing the discus requires much the same effort as has been described for previous feats of hurling; but there is one movement that must be mentioned. It consists of a turn-round, mazy, waltzing action, which is indulged in as the discus is sent on its course. A fine state of animal flexibility from head to foot, the lowered and loosened hurling arm with everything at the thrower's disposal combined to assist delivery and the all-important

timing of the body and extremities as the arm goes through the action of flinging the missile away, still remain as vital demands of technique.

The object should be gripped around the ring, with the fingers well spread out. The strongest delivery is gained when the elbow of the flinging arm rises to the level of the shoulder.



Stance and final part of swing in discus throw:

The Steeplechase

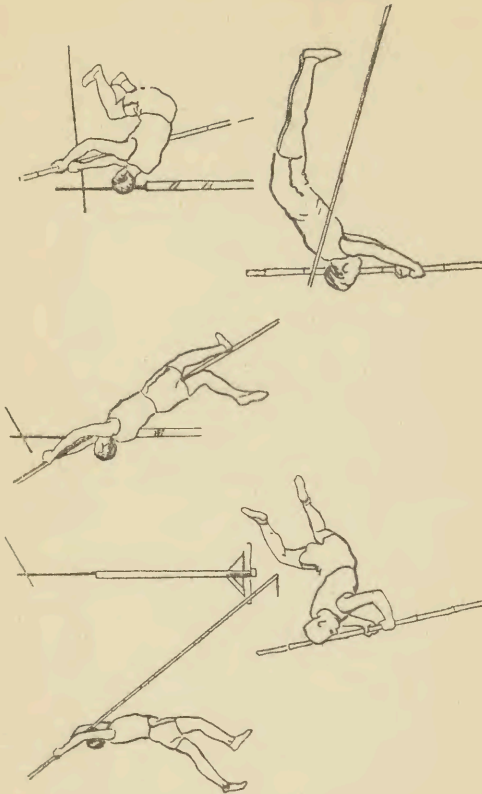
The steeplechase is a race over 3-foot obstacles, and includes an awkward water jump. The reader who wishes to excel at this performance would do well to study the methods of Percy Hodge, who has won many races, not so much by his speed over the ground as his art in clearing the hurdles. Never wasting the slightest distance and always going the nearest way round, this Olympic and British champion has set an

excellent example to would-be steeplechasers. His clever method of jumping into the water as near to the inside edge as he can get, so that he can help himself with his left arm to step up on to the landing side and be almost straightway into his running for the next obstacle, is the best bit of tactics known in connection with this rather neglected class of race. The principal calls upon the steeple-chaser are endurance or staying power and a quick way of clearing the obstacles. It is best to learn both the old-fashioned leap, with the leading leg curled up in front of the body. The modern straight front-leg, though much the speedier method of the two is much more tiring, and we do not recommend it. The change from one style to the other during the race (the championship is over a 2-mile course) will be found of no little assistance. In any case, the acquiring of both styles enables the runner to avoid over-fatigue.

The Pole Jump

This very spectacular form of jumping owes its origin to the ingenuity of the men of the fells and dales in Northumberland and Cumberland, where stone walls and ditches are encountered only too frequently. Armed with a long stiff pole, the agile native of those parts would lever himself over and across walls and streams, and take his pole along with him for service in other similar emergencies.

In its first state, the pole jump was a simple upward swing. The height and length of the



Five phases of a pole-vault.

vault of jump depended upon how near to the top end the pole was handled. The pointed or spiked bottom end was stuck firmly into the ground while the vaulter and the pole made an upward swing which carried them to the highest attainable pitch, and then an outward descent to the other side. As an athletic event pole-vaulting underwent several stages. The favourite champion of the old days was Tom Ray, of Ulverston—a progressive spirit who introduced a climbing act which enabled him to rise to a higher plane than was possible by the plain swing-over previously adopted. But the “climb” was ruled illegal. Then the studious and ever-painstaking Americans let us know that we had not said anything like the last word on this vaulting sport, and we soon learnt that many of their best men were clearing 12 feet. This improvement was due to the work done when the pole had reached its upright position, and was momentarily held there by the strong made-up hole arranged for the bottom of the pole to fit into. With this arrangement, the vaulter could give the pole a certain security while taking the momentary pause at the top of the flight. At the top of the flight, the ingenious Americans devised a form of backward somersault, turning from the first rising position by powerful arm-work and vaulting neatly over the bar and facing it again as they dropped to the landing pit. In the same movement the pole was pushed back and prevented from falling on to the cross-bar.

Training Items.

Do not be in a hurry when training ; let your practice be slow and easy. You will find that strength and ease come more surely from gentle exercises than from high-pressure top-speed work.

You will require suitable clothing and shoes. In any case, it is absolutely necessary to change your dress. To wear the same things on and off the athletic field is the surest way to catch the most severe colds and chills. Running shorts and vest are necessary and so is the vital woollen "sweater." You will need the latter to put on *immediately* you have finished an exercise or completed a spin. Spiked shoes are a necessity in nearly every kind of going. In the cold and damp of autumn, winter and spring, it is safer to wear the old-fashioned, long woollen under-drawers or pants, a cap and a pair of gloves rather than be made uncomfortable with the prevailing cold.

Never forget that to be at his best an athlete must be warm and feel warm. His body temperature should be as high as about 100 degrees for him to be in proper working order. So it is only a simple precaution to trot about, to swing the arms around and, while "warming-up," to loosen out the joints and brisk up the blood circulation before entering a race or doing any serious work. It should not be overdone, however ; a brisk shake-out is always necessary.

The question of body friction or rubbing

can well be dismissed by the statement that good massage is very helpful after strenuous racing, especially when long distances are concerned and exacting work has been done. Before a race an ordinarily intelligent youngster can do best for himself by the "warming-up" exercises. But for such as the javelin, the weight, the hammer and discus performers, massage may be a necessity.

If possible, have a bath *immediately* you come off the track. Don't stay about until you have cooled down, but keep on the move so that you go into the dressing-room feeling warm. A vigorous towelling will then bring a warm glow to your body and you will feel all the benefits of your outing.

The very best sort of bath one can have is a warm one followed by a cold spray. It keeps the skin in fine condition. When you leave the bath, never fail to look at the state of the toe-nails, which must be kept short. Any attention given to the feet in the way of rubbing will not be wasted. The feet are kept in the best condition by daily washing, followed by rubbing with a gloved hand or towel.

As with the feet, the care of the teeth and the stomach is very necessary to the athlete. Before he goes into training and while he is in training his teeth must be overhauled by a dentist and he will require to take from time to time, at the beginning of special training, and, say, weekly, doses of liver-clearing medicine (usually calomel), for the

healthy condition of the stomach is more dependent upon the well-being of the liver than most people imagine.

To be well-shod is, also, a tremendous help. For the sprinter a very tight shoe is best ; for the middle-distances, a shoe slightly less so ; but for the longer distances, an easier shoe allows for the ease that comes with foot-spread. The sprinter requires long spikes for soft, loose cinders, and short, very sharp spikes for tracks which are hard or frozen. On the road or over the country, the rubber-soled shoe or an arrangement of rubber covered in by leather is especially needed ; and heel pads are of the greatest assistance on hard ground. For soft going, the spiked shoe cannot be improved upon. The most suitable spike or stud for the country depends mainly on practical personal tests.

Plain food is the best you can have. Everybody should know what food and drinks agree with him best, and he should keep to them. Regular habits help one enormously. They are, indeed, the backbone of athletic culture. Early to bed, early to rise, the open window, the walk in the fresh air before breakfast, the care not to take active exercise until a full two hours and more after meals ; to walk whenever possible : these are the little points which count.

Ricks, sprains, burst muscle-sheaths (the chief cause of sprinters' breakdowns) and strained tendons can be guarded against by not attempting any very fast or heavy exercise

until one has gradually stretched and warmed the system up to the required 100 degrees temperature. Rest will not cure without a certain amount of walking and trotting about. Do not limp or favour the injured leg any more than is necessary. It may be that well-applied plasters or bandages assisted by plenty of easy warming-up work may get your bad leg to hold for one race, but, as a rule, in the swiftly run short distances a severe breakdown means an end to racing for several weeks and, maybe, months.

A bandage on the lower part of jarred shin muscles (usually caused through running, jumping or hurdling on very hard soil or boards) has been known to give great relief. The jumpers and pole-vaulters are always doing themselves some slight injury. There is no more painful thing than a bruised heel or instep. Treatment with alternate bathings of hot and cold water, a pad of cotton-wool inside the ordinary walking boots or shoes and plenty of gentle hand-rubbing will soothe and stimulate.

For open wounds, such as being "spiked" or a fall on the cinders, dab on liberally a solution of tincture of iodine; put it on without any loss of time, but do not use the tincture undiluted. Get a chemist to supply the proper strength. Don't wait to clean the wound.

The greatest safeguard against falls, and even such accidents of the track as spiking, can be minimized, if not altogether avoided,

by the runners using the *across the body* (for sprinters) and the *inwards arm-swings* for the middle and longer distances. Unless one is moving on a good body-balance there is a likelihood of something occurring, from a breakdown to a fall, in top-speed efforts.

"Nerves" will always get hold of the athlete, no matter how fit he may be. There is no cure. Nor should there be, as out of his intelligence he will be agitated about the trial. So long as he sleeps well, eats well and follows his training faithfully, while keeping the best of his strength for the day of the race, the results should be worthy of his efforts.

It is courting physical disaster to start hard training and racing before a youth is out of his 'teens or beyond the veteran stage of 35 or 36 years. There are exceptional youngsters and veterans who can do these things with impunity. The average youth or veteran will be well advised to leave well alone and remember that the prime of athletic vitality ranges between the ages of 23 and 35 years.

To those much below or much above the ages of 23 and 35, distance running is liable to cause heart strain, and that common running ailment known as "the stitch" arises more from the stomach muscles being unable to withstand the sway and strain at the hips than even the inability of the diaphragm or natural "bellows" of the body to continue acting at a higher set of movements than it is, normally, accustomed to do.

One needs to be very fit, and to arrive at

that state of fitness by long and gentle exercises, to withstand the enormous effort entailed in running.

For running kit, in fine, warm weather, just a sweater, vest, knicks, shoes and toe-socks. Under all must be the supporting pair of "slips" or light jock-strop. In cold weather, these details must be augmented by a pair of long woollen drawers, flannel trousers or American button-at-the-bottom pants.

When the athlete is in a heated condition the surest preventive against a chill is a cold shower or sponge-down with cold water to ensure the pores of the skin being closed. A good friction by towel-rubbing restores the circulation in the most agreeable manner.

The cure for a cold or chill is a rest from all athletics, with good food, until normal health is restored.

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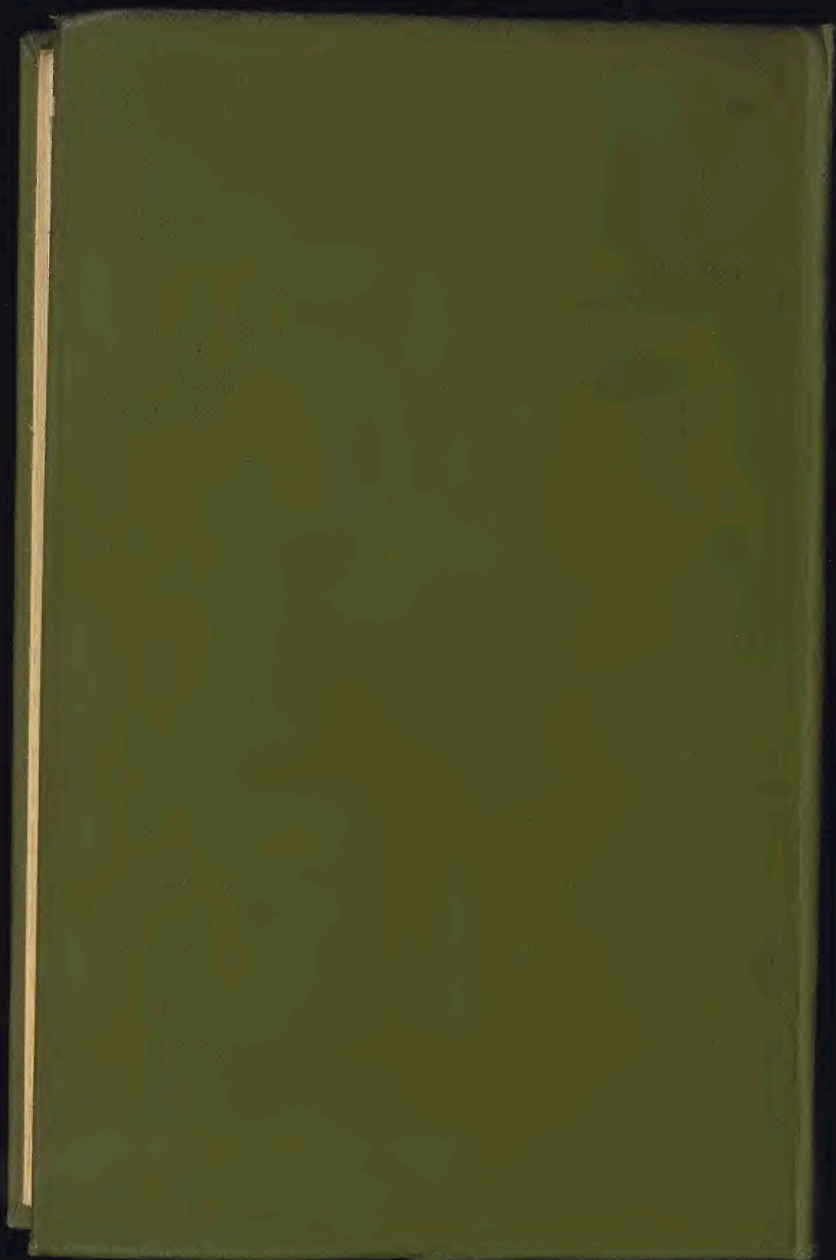
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