ATHLETICS

F. A. M. WEBSTER

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British Sports Library

EDITED BY CAPTAIN F. A. M. WEBSTER, F.R.G.S., F.Z.S.

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Major W. T. Blake made his first ascent in 1908, has been a pilot since 1911, and has flown about thirty types of aeroplanes, as well as seaplanes and airships. He has flown over the greater part of Europe, Western Asia, and North Africa, and was the leader of the first attempt to fly round the world in 1922, the attempt ending in Calcutta with an operation for appendicitis.

Captain F. A. M. Webster's qualifications to write on athletics are indisputable. He was English A.F.E.A. Javelin Throwing Champion in 1911, English National Champion in 1923. He was Midland Counties Javelin Throwing Champion in 1920 and 1921. Midland Counties Discus Throwing Champion in 1922, and runner-up in the English National Discus Throwing Championship in 1923. He has toured practically the whole world for the purpose of studying the technique of athletics, and has written numerous standard works upon the various phases of the sport as well as a history of the evolution of the Olympic Games.

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THE AUTHOR THROWING THE DISCUS IN THE ENGLISH CHAMPIONSHIP, 1923

ATHLETICS

BY

F. A. M. WEBSTER

ENGLISH JAVELIN THROWING CHAMPION
1911 AND 1923

ILLUSTRATED BY A. W. CLOSE

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THE AUTHOR THROWING THE DISCUS IN THE ENGLISH CHAMPIONSHIP, 1923

First published in 1925

Printed in Great Britain

TO

THE LATE A. E. FLAXMAN

W. E. B. HENDERSON

AND

F. R. WEBSTER

This book, intended primarily for the guidance of the rising generation, is affectionately dedicated to the Past, as represented by the late A. E. Flaxman, of Hammer Throwing fame; the Present, in the person of W. E. B. Henderson, holder of the British Native Discus Throwing Record; and the Future of my own small son, Frederick Richard Webster, in the hope that he may follow worthily in the footsteps and traditions of those who have gone before him, and whose patient endeavour and clean sportsmanship he and all other young athletes should keep ever present in their minds, remembering that the great thing in life is not to win the prize, but to run a losing race well, to be modest in victory, and generous in defeat.

F. A. M. WEBSTER.

BROMHAM, NEAR BEDFORD.
February 1925.

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CHAPTER I

FOR PARENTS AND SCHOOLMASTERS

Up to a few years ago athletics at our Public Schools were regarded merely as a "rag." No proper time was set aside for preparation, no tuition was available, and no one took any great amount of interest in the Cinderella among sports, which was regarded as fit only to fill in the fag-end of the second football term. The boy with a natural bent for athletics, who went on from school to either Oxford or Cambridge, and turned out at Iffley Road or Fenner's, received a rude awakening and, for the first time, in all probability, learned that even the Oxford and Cambridge sports at Queen's Club are not the be-all and end-all of an athlete's career.

Immediately after the war our Blues began to take a very active part in the wider field of public competitive athletics, schoolboys began to seek instruction and to acquire technique, and inter-school matches, such as that between Harrow and Charterhouse, Eton and Lancing, came into fashion.

In order that the young athlete, who would naturally dislike a sport confined merely to the old-

time pot-hunting handicap meetings, may see that the status of the Amateur Athletic Association is comparable to that of the Rugby Union or the M.C.C., it may be as well to sketch briefly the progressive series of championship meetings which lead up to international honours and the super-international of the Olympic Games.

There are no actual championships for schoolboys in England, since the Powers-that-Be object to the use of the term "Championship" in this connection. In reality the Public Schools Sports, promoted annually by the London Athletic Club, at Stamford Bridge, London, afford schoolboys the opportunity of testing their athletic prowess against the best of the young athletes from other schools.

A Quarter Mile Challenge Cup for Public School Boys was instituted by the London Athletic Club in 1890; six years later further cups were offered for the One Mile Distance and the 120 Yards Hurdle Race; in 1897 100 Yards, Half Mile, Three-quarter Mile Steeplechase, High Jump, and Long Jump were added to the programme of what had now become the duly recognized Public Schools Sports meeting. In 1919 a One Mile Walk was introduced; this year (1925) there is to be a Pole Vault, and it is probable that the next few years will see the Low Hurdles, Shot Putting, Discus and Javelin Throwing and perhaps Hammer Throwing, with a hammer of

a weight suitable to the use of boys, added to the list of challenge cup events.

There are, in addition, 100 Yards, 250 Yards and a High Jump junior competitions for boys from fourteen to sixteen years of age.

In 1899 there was instituted a Public Schools Athletic Challenge Cup to be held for one year by the school scoring the greatest number of points. The points are reckoned as follows :—

Not less than 8 starters in an event. 10 points for first, 5 points for second, and 3 points for third.
Not less than 5 starters in an event. 8 points for first and 4 points for second.
Less than 5 starters. 6 points for the winner.
If a Public Schools Sports record be broken the winner will score 3 extra points.
If the Public Schools Sports record be equalled the winner will score 2 extra points.

The competition for this cup is wonderfully keen and some very famous schools have won it, as will be seen from the following list of holders. By a curious chance neither Eton nor Haileybury, although both have been well represented, have yet succeeded in inscribing their names upon the coveted trophy.

As regards individual honours, a first prize is given in each event, a second prize is given if there are five competitors, and a third prize if eight compete.

All races are run on cinders, except the Steeplechase and 120 Yards Hurdles, and there are sand-pits for the jumpers to land in.

HOLDERS OF PUBLIC SCHOOLS ATHLETIC CHALLENGE CUP

To be held for one year by the School scoring most points.

1899	Repton
1900	St. Paul's and Great Yarmouth (tied)
1901	Great Yarmouth
1902	Bedford
1903	Bedford and Wimbledon (tied)
1904	Wimbledon
1905	Ipswich
1906	Ipswich
1907	St. Lawrence, Ramsgate
1908	Reading
1909	Abingdon and Oundle (tied)
1910	Highgate and Merchant Taylors (tied)
1911	Battersea G.S., Perse School, Cambridge, and St. John's, Leatherhead (tied)
1912	Emmanuel
1913	Bradfield and Bury (tied)
1914	Bury
1915	Emmanuel
1916	Latymer Upper
1917	Harrow
1918	Rugby
1919	Merchant Taylors
1920	Shrewsbury
1921	Shrewsbury
1922	Eastbourne
1923	Clifton

HOLDERS OF PUBLIC SCHOOLS ATHLETIC CHALLENGE CUP—*Continued*

1924	Lancing
1925	
1926	
1927	
1928	
1929	
1930	

A boy's athletic career after he leaves school will be governed by his circumstances. If he goes up to one of the two senior universities he will join either the O.U.A.C. or the C.U.A.C., and will train to represent first his College, and with the hope of ultimately attaining the distinction of a "Blue" and representing his university at Queen's Club, possibly of figuring for the combined English Universities against the American Universities at home or abroad.

The system in Scotland and Ireland is very much the same, comprising Inter-Scholastic and Inter-University meetings.

There are also to be considered the Provincial Universities. Each holds its own sports meeting. Then there are the Christie Sports, held annually between the Universities of Leeds, Liverpool, and Manchester, and the Inter-University Board of Great Britain and Ireland Championships, in which the various events are fought out between the provincial universities of Abergavenny, Aberystwyth,

Bangor, Birmingham, Bristol, Cardiff, Durham, Leeds, Liverpool, London, Manchester, Nottingham, and Sheffield.

If a boy goes into the Services there are sports at H.M.S. *Britannia*, the Royal Naval College, the Royal Military Academy, the Royal Military College, and the R.A.F. College, and, in addition, Inter-Collegiate matches.

In the next stage of his career the old Blue becomes a member of the Achilles Club, the Service cadet represents his regiment, and the provincial university men and boys, who go straight into business, join a club. In London there are the London Athletic Club, South London Harriers, Blackheath Harriers, Thames Hare and Hounds, and the Polytechnic Harriers, all clubs of good standing ; in the provinces such famous bodies as the Manchester Athletic Club and the Birchfield Harriers (Birmingham).

We now come to the question of public competition, not of the handicap order in which prize values are apt to assume an undue degree of importance.

The Amateur Athletic Association has recently instituted a system of County Associations working under the District Associations in the North, Midlands, and the South. These county governing bodies promote Inter-County Matches and County Track and Field Championships early in each athletic season ; next come the Northern, Midland,

and Southern District Championships, open to athletes with a birth or residential qualification within the area; these are followed by English, Scottish, Welch, and Irish National Championships, for men with the necessary qualification of birth or parentage. Then come the annual A.A.A. Open Championships at Stamford Bridge, London, at which athletes from all parts of the world compete. There are also various internationals, such as the three-cornered contest between England, Scotland, and Ireland, and our annual match with France; and, finally, the Olympic Games which take place every fourth year, and at which Great Britain is represented by one combined team, which does not, however, include our Dominion, Colonial, and Indian Empire athletes, these having separate representation of their own.

From what has already been written the young athlete will see that if he has a preference for athletics over other branches of sport, he will find it just as easy throughout his active career to follow the track and field events as it is for the cricketer or football player to keep up his games as long as his wind and his muscles will serve him.

At the very commencement of this book it will be as well to discuss certain fallacies that have lived too long and some other matters that need correction.

From the parent's point of view the greatest

objection to allowing a youngster to take part in athletics is the fear that he may shorten his life by developing that mysterious condition known as "athlete's heart."

In the first place, let us admit at once that there are certain youngsters whose physique makes doubtful the wisdom of letting them take part in any form of sport; on the other hand, many a weakly child has been turned into an exceptionally strong man by the proper practice of athletics under strict supervision.

Where there is any doubt about the matter it should be cleared up by having the child examined by a doctor *who is himself a sportsman.*

The sound boy has nothing to fear and everything to gain from participation in athletics, always provided that he is supervised and not allowed to overdo things.

The late Michael Murphy, who was chief athletic coach to America and a keen observer, writing of the so-called "athlete's heart," said: "The heart is an automatic organ, and as such it more readily adjusts itself to the strain put upon it than any other part of the body. Naturally, constant exercise will enlarge the heart; but it is an enlargement which takes place gradually and in the same proportion that the other organs of the body are enlarged. The larger and stronger the heart the slower will be

its beats. In other words, a heart with a pulse beat of 60 to the minute will do the same amount of work as another heart with a pulse beat of 72. But why should one be concerned if his heart, beating 60 times to the minute, sends the same amount of blood through his arteries as his comrade's heart beating 72 to the minute ?

" I have made a very careful study of this question from the standpoint of medicine and applied athletics. Not only have I kept a careful record of the effects which athletic competition has upon the average boy, but I have obtained the testimony of athletes who were also physicians. The consensus of their opinion is that the athlete who takes good care of himself and does not acquire the habits of drinking and cigarette-smoking has absolutely no reason to fear any evil after-effects from the so-called ' athlete's heart.' On the contrary, a system of sane athletic work is sure to strengthen the heart and make it less liable to injuries from sudden strain put upon it or from excitement."

This is the well-considered opinion of an eminent authority, based upon lifelong experience and experiment, and it is one to which the rest of us are bound to pay good heed.

We now come to the consideration of what is injurious to the juvenile athlete.

In the first place, too strenuous and too frequent

practice before the body is properly toned up to take the strain is almost bound to be harmful; professional football players are fully aware of this fact, and that is why for weeks before the football season opens they undergo a course of physical training.

The tendency of the British schoolboy, in fact of all British athletes preparing for athletic competition, is to turn out each and every day and to see just how well they can perform each time they pull on their spiked shoes. It is not, however, by daily, all-out trials that proficiency is obtained; but rather by close adherence to the old maxim that " practice makes perfect." There is no reason why the athlete should not train for six days out of every seven, provided that a large percentage of such training is devoted to easy work for the acquisition of style, staying power, and that degree of nervous energy which makes for quickness. On one day in the week only may he go all-out to satisfy his very natural curiosity as to the sort of progress towards efficiency his scientific training is producing.

In this connection I would quote the case of A. R. Pope, who formerly held the American A.U. and Canadian Discus Throwing records. At the time when he was preparing for the 1924 Olympic Games Pope wrote to me: " I am getting in condition now, but do not work very hard, only a few times a week.

The main thing is to know the style and to keep the muscles in good condition. While learning to throw the discus I used to practise two and three hours at night, and learned a form different from anyone I have ever seen."

Just think of it a moment, two or three hours' light practice every night for a number of years, purely and simply to build up or acquire the correct technique. No straining, mind, no striving after immediate results, just painstaking practice to get the right sequence of movement. Pope's procedure was the right one, and applies to the track events just as much as to the field events.

Again, one may well quote the great American high jumper and former world's champion, Dick Landon, who has beaten 6 feet 5 inches. He writes me that he "gives little attention to training, other than a small amount of practice prior to competitions and a great amount of walking," but when he entered Yale University from the Hotchkiss Preparatory School in 1917, and came into the hands of the late J. J. Mack, he devoted hours innumerable to the practice which ultimately produced his present perfect style.

I have quoted Landon, because his remarks raise the question of walking as a preliminary stage of athletic preparation, a system which I have noticed is very popular in Scandinavia.

A brisk walk of half an hour's duration before breakfast, with the body warmly clad from chin to heels and with a cap on the head, is excellent preparation for the day's work if followed by a tepid sponge bath and brisk towelling. As a natural corollary one is bound to mention road and cross-country running.

This brings us to one of the greatest evils of English school athletics.

At more than one school I know of it is the custom during the period November to March to make the boys strip to their vests and shorts at the school prior to a run of anything from three to four miles out; on arrival at the end of the outward journey the boys first up have to wait about, sweat drenched and shivering, for the slowest runners to arrive. They are then called over and allowed to proceed back *at their own pace and still clad only in vest and shorts* to the school three or more miles distant, where their warm sweaters, which would have saved much damage could they have been put on immediately at the conclusion of the outward run, are waiting for them. This system is little short of cruelty and produces lasting harm.

Then again there are schools that have "famous" —those who have studied the problem consider them "infamous"—long races either across country or upon the roads.

Cross-country running if properly managed and indulged in moderately is one of the most healthful and best body and stamina-building exercises imaginable, as well as being a useful basis for every form of sport. It is one, moreover, which does not impair the track runners' speed, although the stride of the cross-country runner is both shorter and looser than that of the middle distance track runner.

For schoolboys under eighteen years of age paper-chases, which give them a chance to slow down when necessary, are better than races; but even these should be practised sparingly and should never be more than three miles in length. Boys under sixteen should confine their cross-country work to walks and easy jog-trot runs.

In this connection boys should work in graduated groups, under experienced pace-makers, whose duty it is to see that their charges do jog, and neither race nor run themselves to a standstill.

The time to practise cross-country running is in the late autumn, winter, and early spring. Runs should be cancelled on very cold days, and at all times the athlete should be properly dressed. He should wear a long-sleeved, high-necked sweater, running trunks reaching down to his ankles, socks and comfortable shoes. If running against the wind extra protection is needed for the chest, and

a covering of newspaper beneath the sweater will serve the purpose admirably.

The question of clothing assumes important proportions also in connection with the preparation for the school track and field sports. These sports, it must be remembered, and also those at the Service colleges and the universities, are held at an unsuitable time of year when the weather is all against the athlete. It is significant that Oxford and Cambridge have both lately taken a leaf from America's book, and that Blues nowadays always turn out for training clad in sweaters and long trunks to their ankles, and only strip out to vest and shorts either for trials or competition. There is a very good reason for the introduction of this practice. Apart from the danger of chills, it must always be remembered that cold weather has distinct effect upon muscles, and that many a strain that has spoiled a good athlete is directly traceable to the fact that his limbs were not properly warmed up before he made the big effort which produced the strain.

It is, further, of significance that even in hot summer weather the very efficient American and Scandinavian athletes always keep their sweaters and trunks on and their shoes unlaced, so as not to cramp their feet nor restrict the blood flow, until the very last second before they have actually to

compete. Directly the event is over they get back into warm clothing. It is fatal, even on a hot day, to stand about too lightly clad.

Another evil to be guarded against in early training is shin-soreness and over-strain of any muscle. Work on an asphalt road or pavement should be avoided, and in the early stages of training the runner is advised to stick to the turf and to leave the hard track alone until his legs have got a little tone. Any too early attempt to give of one's best by way of a trial should be strongly discouraged.

We come now to the bad old bugbear of "specialization," which has, I firmly believe, done much in the past to make athletics unpopular at the public schools and to delay their progress. That there is a time to specialize is undoubtedly true; but that time is not while one is still at school.

A case came to my notice recently in which a schoolboy competed in an open meeting during holidays and surprised the critics by running a half mile in 1 minute 58 seconds off the 50-yard mark. This is equivalent to 2 minutes 5 seconds for the full distance, a performance good enough to take the Public Schools Challenge Cup on most occasions. This boy shortly afterwards received a letter from a well-known newspaper correspondent urging him to give up rowing and rugby and to concentrate upon athletics. It is obvious, however,

that no department of school life stands alone, and this boy happened to be in the school boat and also in the 1st XV. What would his school fellows have thought of him had he followed the unsound advice of the journalist ?

One admits readily that rowing is bad for the athlete, since it develops the legs in a way that detracts from speed, but football and cricket are different matters. The former, coming before the sports, forms an excellent basis for training and, with the summer game, makes the juvenile sportsman quick, accurate, and supple in movement.

If a concrete case be needed, Eric Liddell, the Scottish Rugby International and 400 Metres Olympic champion, serves our purpose well. He was a football enthusiast, and only dropped rugby for the 1923–24 season in order to prepare for the 1924 Olympiad, at which he won the World's 400 Metres Championship in World's record time, $47\frac{3}{5}$ seconds, having, a year previously, broken the British 100 Yards record, $9\frac{7}{10}$ seconds.

While deprecating early specialization in athletics at the expense of other normal school games, one is bound, however, to admit that the Victor Ludorum scheme of awarding a challenge cup to the boy who scores the largest number of points in the school sports is entirely bad. Quite recently a proud father wrote to a famous athletic critic to inquire

what he thought of the man's son having won half a dozen athletic events in one afternoon. He was doubtless surprised to receive the reply, "I think you ought to be hanged, or put in an asylum, for letting him do it."

It is this sort of foolishly extravagant competition that impairs a boy's health and spoils his future prospects, for no boy can stand either the mental or physical strain of half a dozen hard competitions within the space of a couple of hours, without paying the price of impaired nervous energy and overstrained muscles.

I would rather see a boy of mine carry off a couple of events with really good performances than inscribe his name upon a Victor Ludorum cup, to be handed down to posterity as a memento of his folly, or mine in letting him do it, in wishing to risk his health and future athletic prospects to pander to a custom which should long ago have been reposing peacefully upon the scrap-heap of useless shibboleths.

In any case, it is a system which the sane coaches, both in America and Scandinavia, would not tolerate for one moment in the case of boys, although many a great athlete, of exceptional physical strength, has, after reaching maturity, made good at the Olympic Games in both the Decathlon and Pentathlon.

In America every high school, college, and university has its well-qualified athletic coach, whose salary not infrequently runs into four figures a year; but we do not yet enjoy those amenities in Britain, and in the meantime it is up to games masters and parents to see that juvenile athletes do not overdo things, either in training or in the matter of too much competition in the space of a single afternoon.

There is yet one more point to be dealt with. At present only a few schools include the Javelin and Discus events in their programmes, but Hammer Throwing and Shot Putting are much more common. For all these events firms like A. G. Spalding Brothers, of High Holborn, London, supply impedimenta specially designed for the use of youths. For example, a short javelin, a 3-lb. discus, as against the men's implement weighing $4\frac{1}{2}$ lb., and light shots and hammers can be purchased and should be used.

I emphasize this point, as it is obviously absurd to expect immature boys to juggle with hammers and shots weighing 16 lb., since it is only the very strongest of fully grown and well-developed men who can perform successfully with implements of this weight. Shots and hammers are made in three weights. Boys under fifteen years of age should be kept to the 8-lb. shot, and boys between

sixteen and eighteen to the 12-lb. shot. As regards hammer throwing, boys should not be allowed to practise this event at all, not even with an 8-lb. hammer, before they are fifteen. Even up to eighteen years of age boys should practise this sport in the strictest moderation, and only the strongest of them should use the 12-lb. hammer. The full weight 16-lb. hammer and shot are for the use of the strong, mature athlete only. On the whole, I should say that the javelin and the discus are far more suitable to the immature strength of the schoolboy athlete.

In all events it is essential that those who are entrusted with the athletic education of schoolboys should see to it that the youngsters are taught the right way of doing things from the very commencement. Herein lies Great Britain's best hope of salvation in the fields of international athletic competition.

One so often hears it said, in connection with the marking or laying out of grounds for athletic sports at preparatory schools, "They're only little kids, that's good enough for them." That is all wrong. In point of fact, nothing is too good for the most juvenile of athletes. Bad habits, acquired in the early, impressionable years, are the hardest to eradicate afterwards, and the man who will take the trouble will, if he has the genius for imparting his

own knowledge, find the greatest delight in teaching young boys. They are plastic in mind and body, wonderfully ready to absorb ideas, and have an almost pathetically abounding faith in ones' dictum; and, moreover, they pay for teaching. Only last year I had through my hands a small boy of nine who was keen on pole vaulting. He learned quickly, and soon cleared 5 feet 3 inches, which compares favourably with the 8 feet which many of our university undergraduates are finding to be the limit of their powers at the present time. Another boy of twelve turned his attention to the discus. At the end of a fortnight he showed perfect form and beat 86 feet.

The teacher, however, must be prepared to go to endless pains. He must be a keen observer, with sufficient patience to unearth latent talent, and, if necessary, to start all over again if experience suggests that the boy he is developing may prove better adapted to some event other than that in which he is receiving instruction.

My experience has taught me that boys will listen to brief lectures, especially if they are illustrated by lantern slides, with the most concentrated attention. They will also study photographs and analyse the instruction given in text-books with avidity.

In the end, however, we are bound to come back

to the fundamental principle that the athlete cannot study his own form in action. He may acquire all the theory of technique from text-books and pictures; but he has got to have someone to watch him with the eye of knowledge—someone, moreover, who is capable of picking out and demonstrating to him his faults. The games master or coach is the proper person to fulfil this function, but if such expert advice be not available then two or three boys should work together for the purpose of noting improvements and correcting each other's faults.

Finally, boys should be afforded all possible facilities for watching real champions at work both in training and competition. In this way they will acquire an imitative faculty and soon learn to emulate the feats of those they have observed.

If there is any difficulty in the matter of coaching, I would strongly recommend schoolmasters to get in touch with the Hon. Sec., Amateur Athletic Association, 10 John Street, Adelphi, London, with a view to asking the governing body to send down some expert old champion to give the boys a few hints.

I think, too, that all boys should be encouraged to take part in the Public Schools Sports, held annually at Stamford Bridge, London, in the month of April. Full information regarding these sports may be obtained from Mr. David Basan, Hon. Sec.,

London Athletic Club, 72 Tierney's Road, Streatham Hill, London, S.W. 2.

There is one feature which I feel cannot be too strongly emphasized, so far as the schools are concerned. It is that boys must be given a sufficiently long period of time to prepare for the sports. Long road runs on afternoons when they are not required for football are of little use, because the average youngster, by the very nature of his games, is hard as nails and does not need what the mature athlete knows as the "long building up preceding actual training." What the boys do need is a month, and if possible more, before the sports in which to acquire technique and build up muscles which the other games are not likely to call into play. This applies particularly to starting practice for sprinters, hip-socket loosening, which is half the hurdlers' battle for efficiency, shoulder loosening for the pole vaulters and shot putters, and practice for the jumpers. All these boys are liable to strain themselves by sudden, unaccustomed effort of seldom-used muscles if they are not allowed a reasonable time in which to build the special muscles up.

At many schools it is the custom to prepare the sports ground only a few days before the sports are actually due to take place. This is unfair to the boys, who are thereby denied the opportunity of training on a four-lap track; it is also hard on the

high jumpers and pole vaulters, who thus have no sand-pits in which to alight at the conclusion of the jump or vault, nor is it every school that possesses a permanent long-jump pit.

Practice hurdles with a loose top rail should also be provided for the use of boys in training, and all circles for hammer and discus throwing as well as lines for the javelin throwers should be marked out. If possible a fairly large square of cinders should be set aside for the use of the field events men.

Boys should always do their training under supervision, otherwise there will be far too much racing among the runners and a lot of quite unnecessary energy expended by the field events men.

Above all, the games master or coach should make his charges work to an elastic schedule of training, and should see that the distance runners acquire an appreciation of pace and learn to run to time schedules.

CHAPTER II

SPRINTING

DISTANCE runners may be born, but all great sprinters are, undoubtedly, hand made. The material, however, must be there.

The first and perhaps the greatest determining factor to look for in the sprinter is the long, flat-sided thigh, with the muscles bulking big both above and below; add to this a short lower leg and you have an athlete who cannot help sprinting well, provided always that he has the quick, restless temperament, representing the sort of concentrated energy which, in expending itself rapidly in one glorious burst of speed, reaches the maximum locomotion of which the human being is capable.

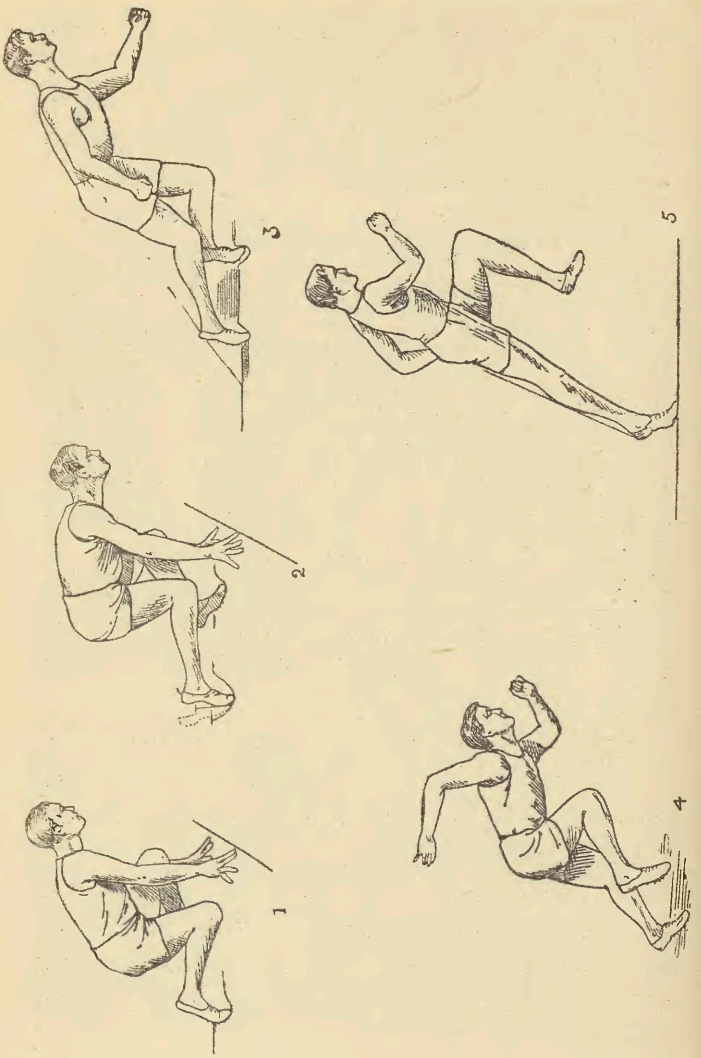
In the past we have seen many great little sprinters such as Walker and Applegarth; but, all things else being equal, the good big 'un will always beat the good little 'un.

The ideal sprinter shows muscular strength in all his body, combined with nervous energy and activity. He should be tall, fairly heavy, and well

split up, especially from the crutch to the knee, and he must have a high instep. If he has all these attributes and can, by practice, acquire general looseness, then he is the natural sprinter who only needs turning into a real champion.

Speaking broadly, there are only two styles of sprinting. The one that makes for looseness and a full stride has as its chief factor the cross-arm swing during the race, and a final going down to the tape. It was on this plan that Mr. Mussabini built up W. R. Applegarth and H. F. V. Edward into world beaters, and it is significant also that when he took over H. M. Abrahams, modified his style, and taught him his particular creation in the way of finishing, that Abrahams, at the Paris Olympiad, beat the record-breaking Charles Paddock of America, who favours what is sometimes styled the " dusting " method, and of which more will be said presently.

In the cross-arm style the hands are carried low, the shoulders pitched perceptibly but slightly forward, while the feet, working on the smallest possible portion of the sole of the shoe, strike the track directly under the body and as lightly as possible in a bounding stride. Every part of the anatomy works loosely. The legs are controlled by the arms, and they in turn are actuated from the shoulders.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There is another advantage of the style under discussion, in that the in-turned hands swinging across the pit of the stomach soon develop the abdominal muscles, so that they are able to work with and contribute to the pull and thrust of the arms themselves.

For a proper appreciation of how this method is carried out, the athlete should hold in his hands a length of wood just large enough to grasp with the knuckles of the first fingers touching, and then run, working his arms backwards and forwards across his body in time to the striding of his legs (Sketch 7). If he is observant he will at once see that this mode of progression involves a hitching up of the shoulders at each swing of the arms, and that this adds greatly to the force propelling his body along.


7

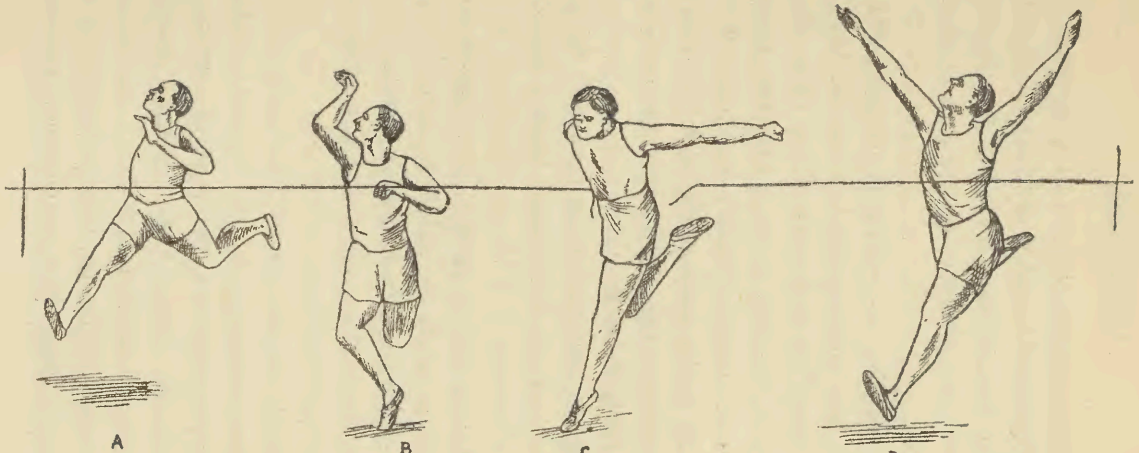
This hitching up of the shoulders, combined with the loose swing of the arms, helps to lift up the feet and prevents them from hitting the surface of the track with that undue amount of force that so soon induces shin-soreness.

A well-developed upper body above strong legs provides the sprinter's engines; his head is his steering gear, and should always be set straight for the tape. To turn the head aside or to fling it

back upsets the whole rhythm of movement, turns you from the shortest path, which is the direct line between any two given points, and also breaks the evenness of the striding (Sketch 6, except c). Finally, the good finisher, according to Mr. Mussabini, maintains his long striding to the end, and in the last stride goes down to the tape with head and chest thrown as far forward as possible (Sketch 6, c). In the opinion of many people it was this finish and the ability to come out of his holes quickly at the crack of the pistol that enabled Abrahams to win the 100 Metres at the Olympic Games at Paris in 1924.

At the other extreme of the sprinter's technique we find most of the Americans, headed by Charles Paddock, Olympic 100 Metres champion in 1920 and 200 Metres winner in 1924, who has also to his credit a whole batch of world's records. To watch Paddock at work is to behold a perfect piece of human mechanism, progressing "mechanically." His body seems to remain absolutely still from the hips upwards, his arms punch hard up and down at his sides, swinging straight forward and back, but his legs shoot out in front of him in high stepping fashion with the rhythmic exactitude engendered by long practice.

In what we will, for the sake of convenience, call "Paddock's Style," the arm movement requires the



Sketch 6

forward swing of one fist in an " upper-cut " which ends in advance of and just lower than the chin, while the backward swing of the other arm brings the other hand to a position just in rear of the hip (Sketch 5).

In both styles of sprinting the straight arm, upper-cut punch is the thing to aim at coming out of the holes (Sketch 4), and if the athlete uses a high knee-lift throughout his races then Paddock's lifting arm swing and downward pull will suit him; but if the more economical and (I, personally, believe) better low carriage, close-to-the-ground action advocated by Mussabini be employed, then undoubtedly the cross-arm action with its accompanying shoulder hitch provides the correct arm carriage.

Before going on to divide up the technique of sprint racing, it will be well for a moment to consider the instructor's function, since this book is in part designed to help those desirous of taking up the teaching of athletics.

The coach should himself be first man on the ground for training work. His first consideration should be the direction and strength of the wind, if any, and the state of the path. According to whether the track surface is hard, provides good going, or is soft he will, when he goes back to the dressing-room, direct the men coming out to train

to put on shoes with short, medium, or long spikes. He will see that they are warmly enough clad for the occasion, and that they set their circulation going with a few brisk bursts of speed (not full speed) before they get down to the actual work of the day. He will see that each man's starting-holes are properly dug, as described farther on. Then he should give them two or three dashes of thirty to fifty yards, started by the report of the pistol, with an interval between each dash.

During these intervals the coach should read what is written about each runner's work upon the surface of the track; for there every improvement in or falling away of form is clearly set out for the information of the instructor who knows his job. A runner feeling "good" on a fast track, or with the wind behind him, will get in extra strides which signify quicker movement and better pace. Conversely, uneven striding or lessened strides may be due to a wind against the runner, bad track surface, or the man himself being off colour. The work will probably finish up with some striding through at a distance beyond that for which the men are training, finishing with a final top-speed burst for the last third of, say, 150 yards.

When checking up the runners' work, the coach should stand well to the side, as a rule, so that he can get a good view of each man's running angle,

which is an all-important matter. The proper degree of the forward lean can be seen from either front or rear if the placing of the feet and the head, knee, and arm positions are studied. If the arms are raised too high the body will get too close to an erect position ; too long a leg-stretch will unduly emphasize the forward lean ; too high a knee-lift will accentuate the too erect carriage ; and a wasteful kick up of the rear foot will throw the body too far forward.

The coach's eye should never leave the runner. In the case of a man running through 150 yards, with top speed switched on at the 100 yards' mark, the coach must watch for the distress signals of arms or head coming up and any obvious tendency to fight for speed. He must note the spot at which the distress signals were flown, and from that build up his charges to " take the strain." Finally, he should take the men over the course, show them their own tracks, and make them realize their own faults.

This is only a brief outline held out suggestively ; but the man who is going to be worth his salt as an instructor will readily see whither it is leading him and plan his own campaign accordingly.

In the case of the mature athlete three months is not too long a time for the preparation of a sprinter. Roughly speaking, there will be a first

month of hardening-out, by not too strenuous work at half-speed and plenty of walking. The second month is the critical time, in which the runner learns to come fast out of his holes and to finish with a top-pressure burst of speed, leaving the middle of the race to look after itself, as it always will do. At this period, too, the man must learn to stride with such regularity that he can run two trials within half an hour of each other without showing even a variation of inches in his striding. Then comes the final period when trainer and pupil are both "fed up," both anxious about the race and eager to get it over. The athlete, in particular, will be anxious to perform prodigies over the full distance every time he pulls on a spiked shoe; and this is just where the trainer shows his worth in the way he handles his charge.

There are two points to bear in mind. The half-trained athlete is apt to be depressed by the poorness of his form, as proved by the stop-watch; the man who is at the top of his form feels so amazingly fit that he is never satisfied, even with his best, and wants to try all the time to prove that he can do better. Herein lies the danger of letting him do too much.

Schoolboys, as I have already pointed out, are kept so fit by participation in their all-the-year-round games that they have no use for the first

month of hardening-out training referred to above. In all probability the third month of nervous tension would be too much for them, and in any case the youngster who finds a month at his disposal, after the football season, in which to prepare for the sports is mighty lucky; therefore he or his coach must do the best to fit the preparation into that period.

It would be the easiest thing in the world to draw up a three or five months' training schedule upon which the adult athlete might base his own scheme of preparation with but few variations; but where schoolboys and young undergraduates, particularly at the provincial universities, are concerned, the problem presents infinitely greater difficulties.

Most boys, according to my experience, are bad starters and bad finishers. As I have already said, the middle of the race usually looks very well after itself.

Before coming to the question of starting, I would suggest to boys, and to those entrusted with their athletic education, the wisdom of building up the necessary staying power to hold the full speed over the entire distance aimed at. With this object in view, I would point out the value of runs taken on the roads in ordinary clothing and ordinary shoes—runs commencing with 250 yards and

lengthened out to 440 or 500 yards at a half-speed of 10 miles an hour, which postulates $1\frac{1}{2}$ minutes for a quarter of a mile. This sort of exercise will improve the breathing apparatus and strengthen the body to a wonderful degree; it will also enable the sprinter to maintain his pace and accomplish a powerful finish in a hundred-yard sprint.

Generally speaking, it is no bad thing to train at 120 yards if a 100 yards race is in prospect. Here the stop-watch comes very prominently into use. The boy who can run 100 yards in 11 seconds should cover 50 yards in 6 seconds, 75 yards in $8\frac{1}{2}$ seconds, and 120 yards in just a fraction short of 13 seconds. The $10\frac{1}{2}$-second "wonder" should cover 50 yards in $5\frac{4}{5}$ seconds, 75 yards in $8\frac{1}{10}$ seconds and 120 yards in $12\frac{3}{10}$ seconds.

As regards a general training schedule for boys, presumed to be already physically fit by reason of the games they play, we have only a month at our disposal, it is assumed, and therefore we are going to train for five days out of the seven. That is to say, we shall leave Friday and Sunday in each week free, and in the fourth week we shall finish up our training on the Tuesday, if the sports are to be held on the ensuing Saturday.

First Week.—On *Monday* the training should commence with limbering up and starting practice, both of which are to be features of every day's

work before anything else is done throughout the month of training. After the starting practice, two half-speed dashes and three three-quarter-speed dashes of 30 yards each, followed, after an interval, by 150 yards of easy striding for style. *Tuesday:* Two 30-yard dashes at half speed and 75 yards at three-quarter speed. *Wednesday:* One 30-yard dash at full speed and 220 yards at half speed. *Thursday:* 50 yards at half speed, 30 yards at three-quarter speed, twice, and 150 yards at half speed. *Saturday:* 30 yards at half speed twice and 100 yards at three-quarter speed, with the last 25 yards at full speed.

SECOND WEEK.—*Monday:* 30 yards at half speed twice, 50 yards full speed checked by stop-watch, 150 yards at half speed. *Tuesday:* 50 yards half speed, 30 yards twice at three-quarter speed, stride through 200 yards at an easy pace, paying particular attention to easy arm and leg action. *Wednesday:* Starting practice and full-speed 30-yard dashes for poor starters, 440 yards in $1\frac{1}{2}$ minutes for poor finishers. *Thursday:* 30 yards half speed twice, 30 yards full speed three times, stride through 300 yards. *Saturday:* 30 yards half speed twice, 100 yards almost full speed, all out for actual finish.

THIRD WEEK.—*Monday:* 25 yards half speed twice, 40 yards three-quarter speed once, 50 yards

time trial against the watch, stride through 150 yards easily. *Tuesday:* 30 yards half speed once, 30 yards three-quarter speed three times, 120 yards three-quarter speed. *Wednesday:* 30 yards half speed twice, 30 yards full speed twice, stride through 440 yards in 1½ minutes. *Thursday:* 25 yards half speed twice, 30 yards full speed four times, 150 yards half speed. *Saturday:* 25 yards half speed twice, 100 yards final trial.

FOURTH WEEK.—*Monday:* 25 yards half speed twice, 30 yards three-quarter speed twice, 120 yards full speed once. *Tuesday:* 25 yards half speed three times, 50 yards three-quarter speed twice, 100 yards, fast out of the holes, easing off to three-quarter speed after 25 yards for 50 yards, and finishing full speed final 25 yards.

The sprinter should now be fit enough to enjoy rest on *Wednesday*, *Thursday*, and *Friday*. This rest, without in any way impairing his form, will allow him sufficient time to recuperate his nerve forces after the training and in preparation for the actual competition on the following Saturday.

We now come to the consideration of the actual method of starting. In this connection the first thing we have to study is the runner's position and the method of preparing the holes for the reception of his feet.

The "crouch" start is now so generally accepted

that there is no point in discussing any other position. There are, however, good and bad methods of crouching, and it has been held that in nine hundred and ninety-nine cases out of a thousand the sprinter shows bad form in the position of the hands.

The start for a sprint is made from behind a scratch line, in front of which no portion of the sprinter's anatomy must touch the ground before the pistol is fired. Many runners get into the starting position with the thumbs and index fingers of their hands resting on the scratch line or mark; the other fingers are in a row to the rear, and it is the palm of the hand which presses upon the track. In this position the arms afford no real support to the body, to which they should act as two forward props, with such a positive purchase as will lessen the inclination of the body to fall forward before the pistol is fired.

The correct position of the hands is one in which the first two fingers touch the line, with the thumbs and other fingers disposed farther back, and the whole hand forming a tripod, as will be seen from the illustrations (Sketches 1 and 2).

It is of the greatest importance that there should be no setting of the muscles in the crouch position. Tensing in the position of readiness to start is usually due to over-anxiety on the part of the

athlete or to a bad foot position, brought about by raising the balls of the feet away from the back walls of the holes upon the starter's caution to "Get set." If, however, the holes are properly dug, as will be described presently, the latter difficulty may be easily overcome.

It has already been said that each hand should form a tripod and the two arms props. The third prop of a still greater tripod, supporting the whole body, is supplied by the proper disposition of the forward foot. For the sake of argument let us assume that the runner starts left foot forward. Sketches 1 and 2 should be studied in conjunction with the following remarks. The position of the forward foot must, of course, be governed by the build of the individual athlete; generally speaking, however, it should be placed from 5 to 6 inches in rear of the scratch line or mark. The back foot must be far enough behind the front one to allow the runner to get on his mark and "Get set" comfortably. In most cases it will be found that when the knee of the right, or rear, leg rests on the track level with the centre of the left foot, a good, easy position is assured. The distance between the two hands will vary according to the individual runner from $1\frac{1}{2}$ to 2 feet.

When the athlete has decided upon his position he should mark the stations of his two feet with his

spikes, and then, with a trowel, dig out the holes. These must give firm support to the balls of the feet. In the " on the marks " position (Sketch 1) it will appear to the athlete that a slanting back wall to the holes is the more comfortable ; in reality a perpendicular back wall is better, because, when the athlete " gets set," the ball of the foot will come away from the back wall if it is sloped, and there will be a slight retrograde movement in pushing off (see dotted right foot position, Sketch 2). Care must be taken that the rear hole is sufficiently to the right of the forward hole to admit of a comfortable leg spread, by which I mean that a straight line travels up from the toe of each foot to the rear centre of each hip-bone. The holes should never be so arranged that the rear leg has to be swung around before it can be brought through to the front.

When the athletes have prepared their holes, the starter will order them to get " on their marks." Each man will then step into his holes and lower the right knee on to the track ; the left knee is raised from the track under the left shoulder and on a line with the hips (Sketch 1). There is one important point to remember here. If the right knee is too far back, a long, forward action, which means loss of time, will occur in the first stride, whereas the position in which the rear knee is level

with the front foot allows of the rear leg being lifted quickly upward in a chopped first stride action, which makes for quickness, but has the disadvantage, where novices are concerned, of tempting them to shoot upward too quickly instead of gliding out of their holes in the correct angles, which are illustrated by Sketches 3 and 4.

When the starter sees that the men are comfortably settled upon their marks, he will order them to "Get set" (Sketch 2). If the rear knee is then simply lifted from the track, the athlete will lose a great advantage in tensing himself for the get-away. Before the knee is raised the whole weight should go forward on to the hands, arms, and forward leg, and, incidentally, the forward knee should be pressed down towards the track before the rear knee is raised. Care must be taken that the arms are held perfectly straight from shoulder to wrist, any bowing of the arms at the elbows or the lowering of the palms to the track will spoil the "get set" position. The forward lean of the body brings the head well in advance of the start line, and a facing-downward-and-ahead position of the head should allow the neck easy relaxation (Sketch 2). At this stage the athlete must feel like a greyhound held in leash and eager to be slipped.

At the crack of the pistol the race is on. The

hands are lifted, and the left leg starts the runner on his course with a vigorous push-off from the back wall of the hole, and he gains added momentum by the forward movement of the left arm, bent at the elbow, which is swung upward in imitation of the boxer's upper-cut (Sketch 3). The rear leg comes through with a lifting upward push of the knee (Sketch 4). In this position there should be a straight-line effect from the heel of the left foot to the back of the head, and the athlete's whole body should show a marked forward lean ; the right arm swings hard to the rear. The first stride sees the right foot chopped downward towards the track as quickly as possible. As the left leg comes forward for a second chopped but slightly longer stride, the right arm is punched through to the front in another upper-cut with the elbow bent. If the forward swing of the arm is made with the arm fully extended, the return movement is bound to be slower than is necessary. The third stride is almost of normal length ; the knee action is straight ahead ; and in Paddock's style the hands and arms follow the same scheme, just missing the sides of the body. Those who favour the cross-arm action work the arms diagonally across the chest. There is this to be added about Paddock's action—that the forceful upper-cut, which all athletes use in coming out of their holes (Sketch 4), is abandoned as soon

as the runner gets into his stride, after which the muscles are relaxed as the arm swings upward until the fist is opposite the shoulder, but are tensed for the down chop, which helps to propel the body and also preserves the correct forward lean.

Even the tallest and most efficient of sprinters will not encompass a stride of more than 7 feet 6 inches; the majority will find their range between 6 and 7 feet.

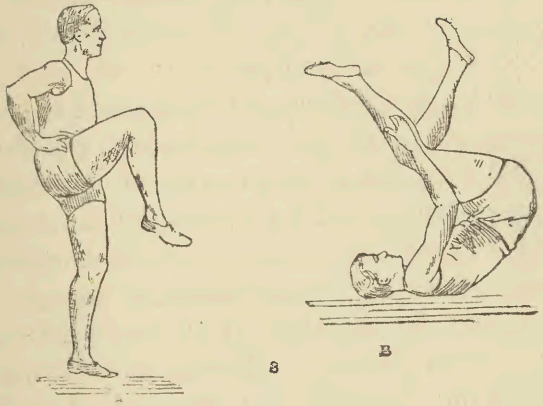
At the start the athlete must remember that the push-off comes from the ball of the left foot, and that he must, therefore, concentrate his mind upon lifting his hands from the track as well as putting into action the forceful punch of the arms. For quite 20 yards the athlete is getting as quickly as possible into his running, but not until that distance has been covered should his body reach the highest lean of the correct sprinting attitude (Sketch 5), nor his stride lengthen out to its uttermost.

There are many men who will tell you that they go through a whole 100 yards dash on a single breath. This may be so. It is more usual, however, to get a second breath for the final burst, when the athlete comes higher up on to his toes and leans farther forward at about the 75 yards mark. As the lungs are emptied and refilled he must strive to force himself along even faster—or

perhaps one should say, to generate more power—otherwise there will be a distinct falling off in pace for a period of two strides—not much, but quite sufficient to cause him to sacrifice the race. Others breathe all the time.

Finishing is largely a matter of the ability to hold one's form in the stress of great excitement. Paddock, we know, uses a jump finish (Sketch 6, D), which upon occasion has served him well, but Paddock is a phenomenal performer, and there are few sprinters, one believes, who can afford to break the precise action of their legs by such a performance, added to which the average sprinter neither is nor should be poised for jumping at the conclusion of a hard race. Many men accomplish a successful finish by running straight through the tape without any variation at all in the sprinting action ; others throw the shoulder at the tape in the last stride ; but although this method has undoubtedly won races, it usually results in the athlete screwing his head round and bringing his knees up in such a way that he actually retards his progress (Sketch 6, B). One should aim to run to a point well past the winning-post, and I think Mr. Mussabini's method of throwing the head and chest as far forward as possible in the last stride—in other words going down to the tape—is the best style of finishing I have ever seen (see Sketch 6, C).

We now come to the question of what actual exercises the sprinter should use in training to increase his efficiency. Since it has already been pointed out that the arms and shoulders play no small part in this event, it is obvious that exercises for the strengthening of the torso are desirable. The back and abdominal muscles also need building



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up, and for this purpose, and also for the improvement of the leg muscles in action, Paddock's special exercises (shown in the accompanying sketches, 8A and 8B) are of considerable value. In 8A the leg is raised and then extended as for an actual stride; in 8B the athlete works first as if striding and then as if pedalling a bicycle upside down. For the men who favour the cross-arm action and require to loosen their shoulders, it is advisable to take a piece

of stick, just long enough for the two hands to hold with knuckles almost touching, and to run fast while grasping the wood and working the arms across the body with an upward and downward swing (Sketch 7). The stride should be varied, and "pattering" is good for all types of sprinters. "Pattering" consists of running about 30 yards with short steps of lightning rapidity interspersed with three or four long strides occasionally before the "pattering" is resumed.

There are one or two points to guard against, the first of which is never to come almost upright out of the holes; never kick up the leg too high behind, as this is a waste of energy; never throw the arms up and the head back as you breast the tape (Sketch 6, A); and always, during the course of the race, fix your eyes on the ground some yards ahead of you, and keep the head perfectly still right through the course of the race. Do not try to exaggerate the forward throw of the lower leg from the knee, in the hope of lengthening out the stride, otherwise you will dwell perceptibly between the putting down of each foot.

The 100 Yards is a race at full speed from start to finish, and therefore no judgment is required, nor should the athlete ever allow himself the luxury of turning his head, or even his eyes, to find out what the other fellows are doing. Most men will

go through the first 50 yards without much trouble, but from that point the strain begins to tell, and the sprinter must concentrate upon preservation of his form, building up the mental control by sheer will power, as the strain increases perceptibly as he approaches the tape. Breathing I have already mentioned, and to that I would add that many good sprinters breathe regularly throughout the race, timing a violent expulsion of the breath to synchronize with the downward swing of the arm.

The 220 Yards race is a somewhat different affair, and the man who is going for records at both distances needs to train separately for each at different periods. When preparing for the furlong, he must be made to realize the value of striding and jogging in training, and he must also be capable of running through 300 yards at top speed. The method of running 220 yards depends largely upon the individual. A really fast man will cut out the pace in real sprinter's style for 75 yards, stride easily, but without any perceptible loss of speed, until he has covered 150 yards, and then commence true sprinting again for the balance of the distance. A strong sprinter, not so well endowed in the matter of speed, must make a sprint of the race from start to finish. At all costs the correct form must be preserved throughout the performance, otherwise he will run himself out. The furlong man who has trained

for the 100 Yards on Mussabini's cross-arm action will now find himself at the greater advantage, as the longer distance necessitates longer striding, which is something different to Paddock's fore-leg, down-chop action.

Finally, it must be remembered that the 220 Yards race is run around the bend of a track, if not actually in a stringed course, which provides each athlete with his own lane. In the latter event the man who draws the outside station, and therefore starts in advance of the other competitors to compensate for the wide swing of the track, must not let his apparent, but not necessarily real, lead influence him, otherwise he may relax his efforts a little, and find himself well behind the field when the positions are adjusted at the commencement of the straight run in. It is necessary also for the furlong runner to know how to negotiate a bend. This is best accomplished by dropping the arm nearest to the inner edge of the track—normally the left arm—at the same time inclining the head slightly to the left to preserve the balance of the body going round the corner.

The use of running corks has not yet been mentioned. Most boys will have nothing to do with them at first, but once they have learned their value will not be persuaded to run without them. Properly employed, the corks should be loosely

carried in the hand until they are gripped tightly for the finishing effort. The proper use of them should give the sprinter anything up to ½ yard advantage in the last 20 yards, and the concentration of the grip should help him to hold his form.

CHAPTER III

HURDLING

HURDLE racing is the most popular of all events with spectators—when the proper form is in evidence. In England we see all too few hurdle races of any kind, and only very occasionally are afforded the pleasure of watching two such perfect fencers as F. R. Gaby, of the Polytechnic Harriers, produced by S. A. Mussabini, and L. F. Partridge, of the C.U.A.C., who acquired his excellent technique at the hands of Alec Nelson, the Cambridge coach.

There are three types of hurdle race. Best known to us is the 120 yards dash over ten obstacles, each 3 feet 6 inches in height. The 220 Yards Hurdle Race practised at Oxford and Cambridge is not included in the programme of either the A.A.A. Open Championships or the Olympic Games ; in it there are ten flights of 2-foot 6-inch hurdles. The Quarter Mile distance is run over ten 3-foot hurdles.

The form in each of these races is different, and

it is seldom that the man who excels at one will show equal proficiency at either of the other two.

First of all we must consider what constitutes a good high hurdler—that is to say, one who is training for the 120 yards dash. In the first place he has got to have speed and the nervous energy we have required of the sprinter in the last chapter. He must also be tall and well split up, particularly from the knee to the hip-joint; loose limbed, particularly in the hip-joints; preferably over 6 feet in height; and weighing anything between 12 stone and 3 or 4 pounds under 14 stone. The weight is necessary to bring the hurdler quickly to earth with a downward chop of the leading leg after the hurdle clearance has been made. The men who work at longer distances over lower hurdles need weight, but not necessarily such great length of limb. The records at all three distances are already super-excellent; it seems improbable, indeed, that anyone will ever better Earl Thomson's $14\frac{2}{5}$ seconds for the 120 yards dash over 3-foot 6-inch hurdles. The furlong figures, however, may be cut down by some slashing sprinter who has a natural ability for taking the 2-foot 6-inch obstacle in his stride; and there is every probability that the Quarter Mile time will get a trouncing at the hands of some strong strider who is really fast at the distance on the flat and cultivates the

necessary technique over the 3-foot fences, since this need never be so perfect over the low hurdles as over the high ones.

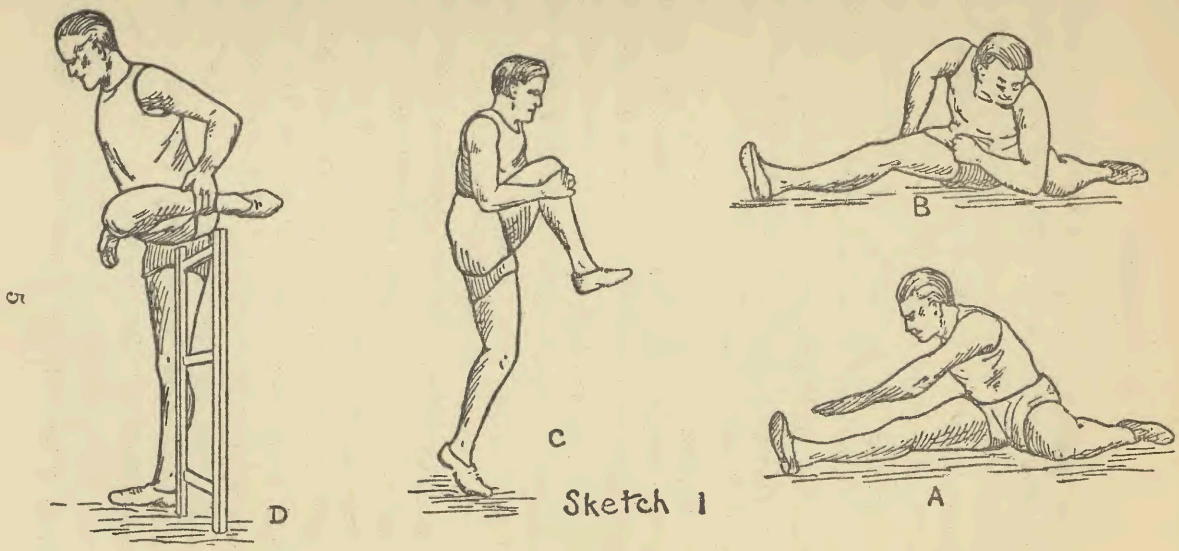
Hurdlers in embryo should study closely the chapters in this book dealing with sprint running and quarter-miling, since they must have both the correct form of starting and finishing and the proper style of running.

To the foregoing attributes it is necessary for the instructor to add to his pupil's repertoire the proper clearance form.

A great deal of this can be taught by placing the pupil in the correct clearance attitude upon the ground (Sketch 1, A and B), and by means of such exercises as are shown in the accompanying illustrations.

Dealing with the high hurdles first, we find that both clearance form and speed are the main essentials; but it must not be forgotten that the man who perfects his form may quite easily gain his speed at the hands of an instructor or by proper personal training. In this connection it is worthy of note that one of the greatest of American coaches has laid it down that a man with perfect clearance form and only moderate sprinting ability may be quite capable of registering 15 seconds for 120 yards over ten flights of 3-foot 6-inch hurdles.

In point of fact, the cultivation of the correct



Sketch 1

three-stride method between fences, and the great physical effort of lifting the body over the obstacle while travelling at the top of one's speed, are factors which are bound to produce all the best of the athlete's latent sprinting ability.

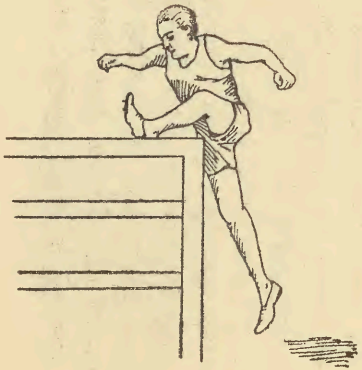
The necessity for perfecting one's form over the hurdles will be readily realized when it is pointed out that any persistent fault which adds a fraction to one's clearance time is multiplied by ten in the course of the whole race.

The clearance has got to be very close to the top rail of the hurdle, and must be practised so persistently that, whatever the clearance margin may be, it varies not at all at any one of the ten obstacles. The clearance must, in fact, be part of the stride, otherwise it will impair the athlete's sprinting form.

Most hurdlers employ eight strides in coming up from their holes at the crack of the pistol to the take-off for the clearance of the first obstacle. Novices generally take from 12 to 14 feet for the clearance of the hurdle, but should aim to get their take-off 6 feet away from it and to land within 4 feet upon the far side. The real champions generally manage to land within 3 feet of the obstacle they have negotiated. This can only be accomplished by the down-chop action of the leading leg, and then again the down-chop is not possible if the take-off is made farther than 6 feet

away from the hurdle. Hurdlers who cannot accomplish the step-over method, but have to bound or sail over, will land from 6 to 8 feet beyond the hurdle, but this cannot be avoided in their case.

Let us assume, for the sake of convenience, that the left leg is the first to go over the fence. It is thrown up stiffly and in such a way that a distinct pull is felt at the back of the knee, the toes being pointed straight upwards in the manner shown in Sketch 2. The foot itself is thrown directly ahead. As the left leg rises, so the body is dipped forward to meet it. In this position the body and leg should form a "V," and the front of the thigh should actually strike against the breast (Sketches 3, 4, 5, and 6). Balance is preserved and the bend of the body from the waist assisted by the flinging forward of the fully extended right arm, which is extended to the front at the same time as the left leg. The left arm may accompany the right (Sketch 3), or it may be dropped so that the right hand comes level with the hip (Sketches 5A, 5B, and 6), but it is better for it to be fully to the rear, on a line with the right thigh (Sketch 4). The right leg is fully extended, and no attempt is made to draw up the knee until the leading foot is well over the top of the hurdle (see sketches). At that stage the leg is lifted upward and outward



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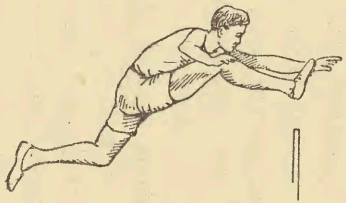

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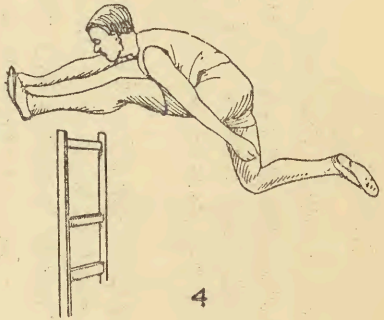

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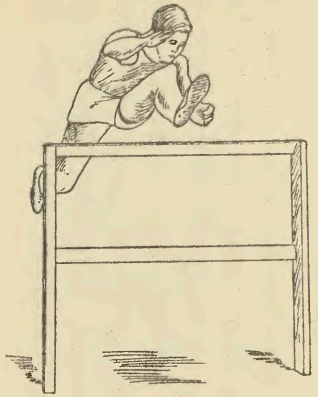

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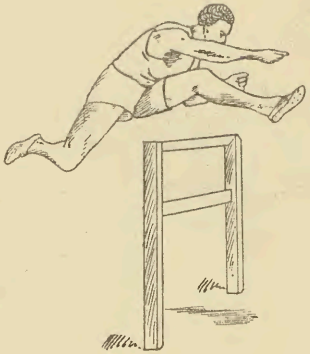

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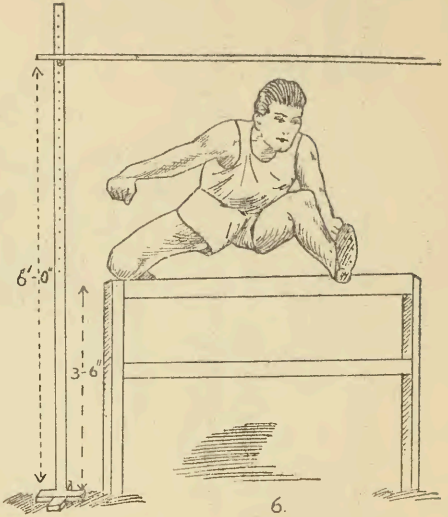


6.

with a semi-circular hip movement, so that the knee is pointing outward while the body is crossing the hurdle (Sketch 6). The underside of the thigh should be parallel to the top rail.

On the far side of the hurdle the left leg is chopped

7.

down vigorously to make as close a landing as possible, and if the body dip has been properly managed in the clearance the torso will be ahead of the left foot, and the correct forward lean of the body, as for sprinting, will be in evidence at the moment of landing (Sketch 7). While the downward chop of the left foot is in progress

the right knee will be raised a little higher and the right foot brought round to the front and swung sharply forward for a full stride. Any mistake in the right leg work will mean a short first stride after clearance, a long stretch out in the middle stride, which breaks the perfect rhythm of the run and leaves the hurdler too far away from the next obstacle for him to effect a proper 6-foot take-off. One should, I suppose, point out that the left arm goes forward with the right leg and that the left arm adjusts itself to the correct sprinting attitude.

I have laid great stress upon the correct management of the right leg, because I know from experience how difficult many men find it to get the right, or rear, hip action sufficiently flexible. Hip flexibility must, however, be acquired, otherwise the right knee will be raised unduly high for the sake of safety and held in that position until the left foot is on the ground, and this means that the first stride after clearance will be only a half-stride and not a full stretch.

It is the loose-hip action which compensates the sprinter running 120 yards hurdles for the necessary interruption caused by clearing the obstacles, and, in fact, enables him to preserve his sprinting form, for, of course, the upper body must not be disturbed or thrown out of true by the right (rear) leg action.

The shoulders should be kept square to the tape throughout the run and clearances, and the hurdler should land lightly but squarely on the ball of the foot after each clearance (Sketch 7).

Fairly heavy shoes, provided with spiked heels, may be used for practice, but for competition work the hurdler should use light sprinting shoes without heels.

Something has already been said about the body dip, which both Earl Thomson, Robert Simpson, and F. R. Gaby showed to perfection, but it is felt that this phase of hurdling has not yet been sufficiently emphasized. The accompanying Sketch 6 will, however, make it plain. The athlete shown in the picture was 6 feet in height and yet was always able to clear a hurdle without touching a cross-bar over it set at 5 feet 9½ inches above the ground. Games masters and coaches who are instructing hurdlers will do well to practise them over a 3-foot 6-inch hurdle with high-jump standards set up on either side of it, with a cross-bar resting on the pegs in the 6-foot holes. This cross-bar may be lowered as the athlete's proficiency increases.

The things which the instructor, or the hurdlers themselves in helping each other, have to look out for are that the athlete comes cleanly up to his take-off, skims close over the hurdle with the body dipping well forward, right leg and left arm

extended, shoulders square to the front, and legs widely separated (Sketch 3, 4, and 5), that he lands close to the hurdle fairly on the ball of his foot, and runs cleanly forward without any wobbling or sideways swing to bring the rear knee to the front in the actual stride. It is particularly necessary to watch that a man does not bustle himself over the tenth flight in his anxiety to reach the tape, otherwise he will either hit the hurdle or stumble on landing and spoil his sprinting style to the winning-post. It cannot be too strongly impressed upon the athlete that he must keep his chin in advance of his leading knee right through the race (see sketches), also that the athlete's body should be slightly in advance of the foot when it strikes the track after the clearance has been effected (Sketch 7).

Training for the high hurdles necessitates a great deal more than is at first apparent, and even to schoolboys a longer period than the one month which is usually available must be devoted to the mechanical exercises which have been invented for improving the suppleness of the body and the loosening of the hip-socket, to striding exercises, and to exercises for the strengthening of the torso.

Boys who are really keen will not mind devoting a couple of months to hurdle preparation, especially as the work in the first month will consist mainly

of mechanical exercises, which they can carry out in their bedrooms, and striding runs on the flat up to 200 yards in length; but it must be clearly understood that the exercises should be practised only a few at a time, and that as soon as the striding becomes irksome the runner should change to a jog-trot. This will help to give him stamina and better wind. The striding pace should be very little faster than a walk, but striding should be practised two or three times a week. Do not forget that the instruction to run an easy or half-speed quarter mile means that you should cover the distance on the track in about 1½ minutes. Do not try for length of stride by extending the foreleg, but bound along comfortably, as this will increase both leg and foot spring.

"Shacking" is another form of running which schoolboys and provincial university athletes will find helpful, not only in athletics, but as a preparation for fitness in all forms of sport. It is a sort of slow shamble of four or five minutes to the quarter mile. In the "shack" the whole body is held relaxed, and the runner lands right on the flat of the foot with a jar at every stride which will shake up the entire muscular system. Ten or fifteen minutes "shacking" will be enough to commence with, but the time devoted to this should be increased during the first four weeks, until one is

able to "shack" for a full hour without feeling either soreness or any bodily fatigue.

As regards the exercises to be taken on during the first month and still practised during the second month, it is a good thing to have a hurdle handy, or some piece of furniture which is flat-topped and 3 feet 6 inches in height, at one's disposal. Let us assume that it is a hurdle. Stand sufficiently far back from it, and kick the leading leg sharply forward and up, with toes pointed upwards, until the heel rests upon the top bar; at the same time dip the body by bending forward from the waist. In this way you will stretch the muscles on the front of the thigh and the back of the knee, which are unaccustomed to exertion of this kind. This exercise may be varied by violent upward kicking and forward body bend, so that the thigh hits the shoulder, but of course the right arm should be flung forward to accompany the rising left leg, or vice versa, and the left arm should drop to the rear. To gain hip flexibility stand at the side of the hurdle and raise the rear left upward until the inner side of the thigh is parallel with the top rail (Sketch 1, D). Let it rest there, and grasp the ankle, forcing it upwards as far as possible to loosen the hip-socket. Take care to hold your body erect all the time. After several lifts have been accomplished, without allowing the body to bend to the

right, leave go of the ankle and lift the leg forward over the hurdle, to allow the foot to come upward and shoot forward.

Stretching exercises, which also help to loosen the hip-joint, are also most important. The athlete should sit on the ground in the position shown in Sketch 1, A and B, with rear leg doubled back and leading leg, which goes first over the hurdle, fully extended to the front and toes pointing upward. He should then swing the body over to the left (for right leg lead) until the doubled-up left arm touches the ground, with the elbow close to the left knee (Sketch 1, B). (Reverse for left leg lead.) This will be found difficult of accomplishment at first, but the various muscles brought into play will soon adjust themselves to the strain. A variation of this exercise is made from the same initial position, but the body bends forward from the waist, as in actual hurdle clearance, and the left arm is fully extended until it almost reaches the right foot position, when the body and leading leg should form the "V," which has already been discussed (Sketch 1, A). (Reverse for left leg lead.) Yet another exercise is that in which the hurdler raises his leading leg to the level of his breast, grasps the shin just below the knee, and squeezes the doubled-up leg in against his breast (Sketch 1, C). At the same time he should raise himself upon the toes

of the other foot. This is an excellent balance exercise, which also inculcates high knee action and the proper forward body lean.

Instructors and coaches should always see that athletes, in addition to limbering up by a few dashes over two or three hurdles, should, before attempting even these, do one or two stretching exercises before turning out for either practice or competition.

The second month's training is suggested mainly for the use of schoolboys and young university athletes who have acquired suppleness and staying power in the preliminary month's work just dealt with.

It is to be taken as read that each day's work commences with stretching exercises and a certain amount of starting practice as laid down for sprinters.

On the first *Monday* of the second month two dashes over three hurdles at half speed will be sufficient if followed by a three-quarter-speed dash over eight hurdles and a steady jog of 100 yards. *Tuesday:* 300 yards run at half speed. *Wednesday:* Three hurdles at half speed three times, five hurdles at three-quarter speed twice, followed by a fairly fast 200 yards. *Thursday:* 150 yards on the flat at three-quarter speed. *Saturday:* Two sharp dashes over three hurdles and 120 yards over the full ten flights at a fairly easy pace.

The second week's work is the same as the first,

with the exception that *Saturday's* run over ten hurdles should be taken at three-quarter speed.

On *Monday* of the third week there should be two sharp dashes over two hurdles, and one nearly full-speed run over five hurdles, with a full-speed dash for the worsted properly stretched between winning-posts, the day's work ending with 300 yards run at half speed on the flat. *Tuesday:* 150 yards, starting fast for 25 yards, then easing off, and finishing the last 25 yards at full speed. On *Wednesday:* three half-speed dashes over three hurdles, two three-quarter-speed dashes over five hurdles, and a fairly fast 220 yards on the flat, omitting the final burst of speed for the tape; 300 yards run at half speed will be sufficient for *Thursday*. *Friday*, as usual, is the rest day; and on *Saturday* a dress-rehearsal time trial may be run over the full course.

Monday of the fourth week should be devoted to two half-speed runs over six hurdles and an easy quarter mile on the flat. *Tuesday:* Three half-speed dashes over three hurdles, one three-quarter-speed dash over five hurdles, and an easy stride over ten flights, with a final burst of speed for the tape to fix the proper style of finishing firmly in the athlete's mind. *Wednesday*, *Thursday*, and *Friday* he may rest in preparation for the competition on *Saturday*.

This is merely a suggested scheme of training,

upon which each individual may base a schedule best suited to his own special requirements.

We now come to the 200 Yards Low Hurdles.

The athlete who decides to take up this event need not of necessity be as tall as the man who fancies the 120 yards dash over 3-foot 6-inch obstacles. The hurdle used for the furlong distance is but 2 feet 6 inches in height, and can be negotiated easily in the step-over style. In point of fact the furlong fencer should never lose the sprint position and body lean from start to finish, not even going over the hurdles, nor should his head rise much higher in hurdling than it does when actually sprinting.

It will be remembered that it was said that even a man of mediocre speed might attain to 15 seconds over the high hurdles at 120 yards, provided he could acquire perfect clearance form; but the man who has not a natural turn of speed should leave the low hurdles alone. Purely mechanical pace can be acquired and maintained up to 120 yards; beyond that distance natural ability and cultivated striding are necessary. Striding ability is particularly mentioned, as it is necessary for the furlong hurdler to accustom himself to covering the intervening space of 20 yards between flights in seven exact strides.

The main reason why most first-class high hurdlers

fail to shine at the longer distance over lower obstacles is because the latter event does not call for the body-dip they are accustomed to using over the high hurdles, and, if the left leg leads, it is not advisable to throw the right hand so far forward in affecting the clearance as is customary at the shorter distance. Another point for the furlong hurdler to remember is that the chop-down of the leading leg to shorten the stride coming down over the hurdle is not for him, although if he finds that he cannot hold the seven strides between fences all the way he may have to chop his strides *coming up to the hurdle* in order to adjust his take-off to the right spot. If he takes off too close he may crash into the hurdle ; if too far away he may land on top of it or be forced to lean so far back going over that he will land badly and with his body out of control. Remember that the body from the waist upwards should not change from its normal sprinting position while the hurdle is being cleared. The average extra rise going over the hurdle is but 2½ inches, and there should be a tendency to lift the body rather than to dip it, as does the high hurdler, when going over the fence.

The instructor may readily appreciate and correct a novice's form if high jump stands are placed on either side of the hurdle with the cross-bar laid on the pegs at a height of 6 feet 2½ inches.

The man who just grazes the cross-bar at that height will do better work over low hurdles than another who can duck under a bar set at 6 feet.

Notwithstanding what has already been said, the furlong hurdler cannot afford to neglect the smaller points of technique in both arm and body action. In particular he should remember that, although a loose hip action is not needed for the actual clearance, it is essential to correct form in the follow-up of the rear leg for a subsequent full-length stride. In short, the action of the rear hip-socket, as already laid down for the benefit of high hurdlers, is compensatory, and allows the low hurdler to adhere to a straightforward movement throughout the race, and yet the hip must not be lifted above a height that allows for an easy, swinging clearance of the top rail by the rear leg.

Remember that the action of a low hurdler is similar to that of an ordinary pedestrian who finds himself suddenly required to *step over* an obstacle in the road which is too low to vault or climb. In other words, the high knee action of sprinters of the Paddock type is admirably suited to the use of low hurdlers.

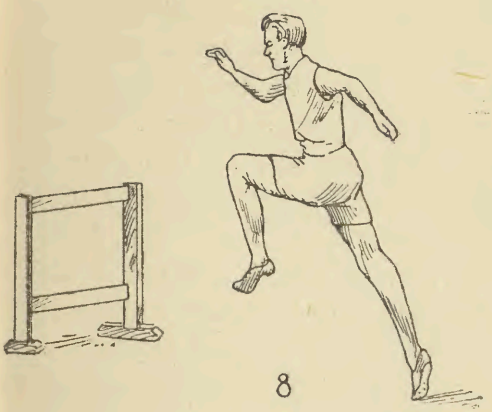
Speed up to and over the first flight is essential, for the primary clearance usually sets the athlete's style over the remaining nine flights. At first it

will undoubtedly be found difficult to hold the " 7 in between " style of striding, but it is worth persevering for, since eight strides means taking the fences with alternate legs leading, and nine strides is altogether too slow.

In view of the fact that 220 and 440 yards races in England are invariably run around the track, the low hurdler should strive to cultivate the ability to take his fences with the *left* leg leading. A left rear leg action tends to throw the runner towards the centre of the track, and means a further distance to cover, and any loss in this respect must be multiplied by ten. The left leg lead brings the runner inwards towards the inner edge of the track, and he may, by sticking to the left of his lane and using an abbreviated left-arm action and a wider swing of the right arm going around the bends, save himself some yards in the course of a furlong or quarter-mile race.

The athlete must consistently build up his ability to start and to cover the initial 20 yards in fast time, and he must go over the first flight of hurdles in perfect form. If, on the approach to any flight, he finds that he has lost pace, he must chop his stride in order that he may go over with the orthodox leg leading; in this way he will overcome the difficulty of take-off and quickly regain his driving power. If he finds it absolutely

impossible to hold the seven-stride method, he must at once drop into a natural style of running. In anticipation of this happening he must spend a considerable amount of time in the practice of running at a hurdle from varying distances, so that he may adjust the final three or four strides before



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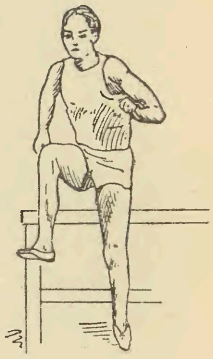

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reaching it in such a way that he will make his clearance in proper form.

In previous chapters of this book emphasis has already been laid upon the value of working from the ball of the foot and of keeping the heels off the ground. To the hurdler, both in the sprint and the take-off for clearance, the exaggerated push-off from the ball of the rear foot is absolutely essential, and cannot be too strictly cultivated (Sketch 8).

The art of landing after clearance calls for a

little special consideration. If the body is held too erect going over the fence the foot, possibly the whole of it, will hit the track unduly hard, but if the hurdler preserves his slight forward body lean, alights on the ball of the foot lightly, and gets the rear hip working loosely in its socket for the follow-up, he should be in fine form for the next stride forward (Sketch 9).

The arm action is almost exactly that of the "Paddock" sprinter, save that the right arm goes slightly forward with the left (leading) leg in effecting clearance and the left arm is dropped to the side or slightly to the rear, readjusting its position for the next upper-cut swing as the left foot takes the ground (Sketches 7, 8, and 9).

Hurdlers training for the two longer distances may practise the exercises which have been already described for the use of high hurdlers (Sketch 1, B, C, and D), with the exception of any which are specially designed for the creation or improvement of the body dip, such as shown in Sketch 1, A.

When thinking out a training scheme and schedule low hurdlers should keep ever in their mind's eye the old axiom that there are plenty of champions over eight fences, but precious few who ever approach record-breaking form over the full ten flights. The "fade-out" of the nine hundred and ninety-nine is due to leg exhaustion and lack of stamina. The

remedy is to be found in a scheme of training designed to create great powers of endurance.

The question of an actual training schedule for the 220 Yards Hurdles presents a pretty problem, which the writer can solve only by such suggestions as will lead the thoughtful athlete to frame a plan of campaign best suited to his own requirements. This is more particularly emphasized by the difference in the types of low hurdlers. There are some who have power and a certain natural turn of speed, and some who are phenomenally fast but have neither the length of limb required for the short dash over high hurdles nor stamina enough for the long grind over low hurdles. There is yet another point. Some hurdlers find that they can train five days a week consistently (leaving out Friday and Sunday), but not, of course, over the sticks each time out ; others—and there have been champions among their number—get their best results by training only on every other day.

For the man who gets leg-weary and fades out too soon there must be plenty of consistent striding work at half and three-quarter speed. Do not forget that half speed is equal to a quarter of a mile *on the flat* in 1½ minutes. If this striding is practised over distances varying from 200 to 300 yards the required leg stretch (for the " 7 strides between flights " method) will soon evolve.

A proper afternoon's work for a man already fairly fit would be striding of the sort just described twice repeated and three 100 or 120 yards dashes at three-quarter or full speed, starting practice, and the hurdling exercises. This work must be interspersed with rests, and the distance striding not brought into the training scheme more than twice a week. It is necessary also to practise running at a hurdle from varying distances very often to ensure proper form from a chopped-stride approach, and also to acquire judgment as to how the stride ought to be chopped to bring the runner through to the right position for the take-off stride.

For the rest, a suitable amount of the training schedule laid down already in the chapter on sprinting must be worked into the low hurdler's scheme of training.

As soon as the athlete has got a certain amount of proficiency and stamina, he should run 120-yard trials over five low hurdles once each week, getting on to full-distance time-trials towards the end of his training. As in all other events, the three days actually prior to competition should be free from training.

There is just one other point common to both the low hurdle races. It is this: remember that although some coaches favour taking the flights

with alternate legs leading, a practice which, especially to the novice, may appear convenient, it is far better to train oneself to that pitch of perfection which enables the runner to throw the same leading leg over each successive flight. It is a golden rule, but it has its exception, in that it sometimes pays, over the last flight at the very end of a hard race, to take the last fence with the leg leading which comes handiest, as this avoids chopping the stride at a crucial point in the race.

In the foregoing advice to athletes training for the furlong race over low hurdles emphasis was laid upon the need of a fair amount of distance work to build up staying power. But now that we come to the consideration of the Quarter Mile Hurdles, comprising ten flights each 3 feet in height, a warning must at once be given that it is necessary for the quarter-mile hurdler to devote quite a lot of his time to the acquisition of sprinting ability. Another point which has been stressed is that the majority of low hurdlers fade out towards the finish, which, of course, argues that stamina they must have at almost any cost. Their staying power, however, need not be quite so perfect as that of the quarter-miler on the flat, but at the same time it is undoubtedly the fact that a good quarter-miler over the sticks should be able to very nearly hold his own with the best of the two-

furlong flyers on the flat. In point of fact, America's plethora of first-class quarter-mile hurdlers is largely due to the circumstance that many an American quarter-mile runner of championship class but not quite good enough to acquire an American title, and yet keen upon being a champion, turns his attention to hurdling, where his wonderful turn of speed, combined with acquired hurdle clearance and knowledge of how to run the race, brings him at last to the premier honours he covets.

Let us assume that the man is in fair condition when he decides to take to hurdling. The first thing he has to do is to acquire the necessary technique, to develop his leg stretch, and to make supple his limbs. A month devoted purely to mechanical exercises and a certain amount of jogging will soon put him right. With the acquired form approaching perfection and his body well conditioned, the athlete may concentrate to a large extent upon the schedule of training set out for quarter-mile flat runners, which is described in a subsequent chapter. Finally, he should cut down his distance work for the sake of building up his sprinting ability and making even more perfect his hurdle clearance.

Coaches and instructors should watch carefully for any sign in the falling off of condition of their charges. If the athlete for a time consistently

lacks the form that he has shown before, or his movements lack cohesion, the probability is that he is afflicted by mental staleness and needs a rest. In designing a man's work for the 440 Yards Hurdles the type of athlete must be taken strictly into consideration and the training schedule designed for his individual needs. Hurdlers at this distance are usually of two distinct types—the real quarter-miler who, knowing his speed, fancies that he can win his race by very fast work over the alternating 40 yards between hurdles, and the other type supplied by the athlete with a real aptitude for hurdling, who counts upon his quick clearance ability and is over-inclined to conserve his energies between one hurdle and the next. The latter type, particularly if he be strong and quite reasonably fast, will do one of two things—either he will slouch over his hurdles or take them with an exaggerated quickness, but in either event the result will be the same—namely, an ill-judged approach and a hesitating take-off. In this respect the novice's difficulty is not so hard of solution as might be expected. The first-rate quarter-miler has got to acquire good hurdle clearance, the natural hurdler must build up stamina, and both must acquire striding technique. The former can sacrifice something of his pace in favour of a set number of strides between flights; the latter must get his

correct number of strides up to and between the first four flights; he may then ease off to what is called the natural gait, but must resume set striding in covering the last three flights before the finish. As regards the number of strides, build will tell. The long, rangy runner can hold a fifteen-stride-between-flights gait at three-quarter speed, but even the best of the small men will have to go all out to hold such length of striding. For such latter athletes seventeen strides between flights at three-quarter speed is in every way preferable to the utter exhaustion of holding the fifteen-stride method at top pressure.

J. K. Norton, holder of the World's 440 Yards Hurdles record, used a set number of strides between flights for the first five or six hurdles and then dropped into the natural stride, thereafter depending upon his own sense of distance to get his take-off accurately—a sense, incidentally, which was built up by constant practice in running at the hurdle from varying distances until he had taught himself to regulate the four or five strides before the take-off, so that he had no difficulty in effecting clearance in good style.

CHAPTER IV

THE QUARTER MILE

Of recent years a good many authorities have laid it down quite definitely that sprinting stops short at the 300 yards mark, where the great Charles Paddock seems to have reached his limit. The Quarter Mile, therefore, goes down amongst the middle distances. Equally it is generally agreed that powerfully built, long-limbed, middle and heavy weights, like G. M. Butler, the ex-Cambridge President, who finished second in the Olympic 400 Metres at Antwerp in 1920 and third at the Paris Olympiad in 1924, are the ideal men for what is perhaps the most gruelling race of all.

And yet it does not do to dogmatize in these matters. B. G. D. Rudd, the famous Oxonian, could often show an exceptionally fast "hundred," to say nothing of a good long jump, and yet found his real *forte* over the quarter- and half-mile distances; Ted Meredith, holder of two world's records ($47\frac{2}{5}$ seconds for 440 Yards and 1 minute $52\frac{1}{5}$ seconds for 880 Yards), and Eric Liddell (British

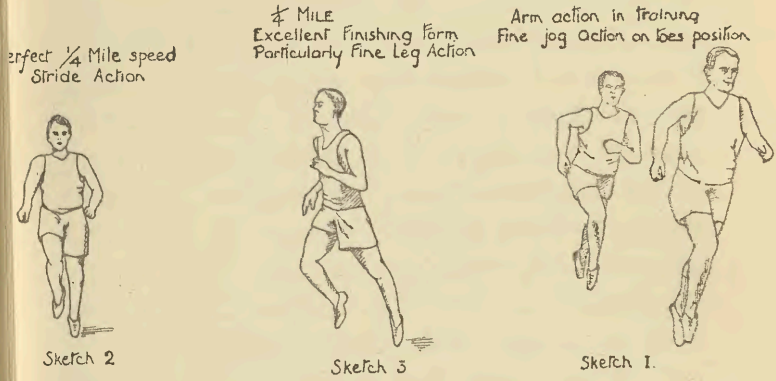
record holder for 100 Yards in $9\frac{7}{10}$ seconds, also Olympic and World's 400 Metres record holder, $47\frac{3}{5}$ seconds), were none of them real big 'uns.

In this connection it is significant that although Liddell in 1923 won the English 100 Yards Championship in $9\frac{7}{10}$ seconds and the 220 Yards in $21\frac{3}{5}$ seconds, he failed to reproduce his real sprint form in the Championships of 1924, but won the Quarter Mile in $49\frac{3}{5}$ seconds, subsequently establishing the Olympic record already referred to. It must be remembered that Liddell was not going for the 100 Metres sprint at Paris, and therefore concentrated his attention upon training for the longer distance. This seems to bear our Mr. Mussabini's contention that "to the first-class sprinter there is nothing more likely to take the fine edge off his speed than a term of quarter-mile training."

A careful collation of statistics seems to prove that the first-class quarter-miler should be something over 5 feet 8 inches in height, powerfully built, and able to go bang through the worsted at the end of a hard race without ever having diminished his speed from start to finish. Liddell at Paris did something more than this. In the final of the 400 Metres he went at what looked like absolutely top speed from the crack of the pistol, and yet altered his action coming into the home straight

and found an extra burst of electrifying speed to carry him over the final 120 yards.

The difference between sprint quarter-milers and the staying brigade can be most easily detected in the method of running the race.



Sketch 2 Sketch 3 Sketch 1.

When the race is run on an unstringed course, the true sprinter type will make for the shortest path between two given points by relying upon his quick-starting ability to carry him to the best position on the inside of the track; this initial dash should carry him at top pace over the first 80 yards into premier position. From that point he may ease into three-quarter speed striding (see Sketches 1 and 2), but it is up to him to maintain his lead at all costs until either he sees that another runner is about to pass him, or the time has come for him to make his last great dash for the tape—

a dash of about 120 yards—in which he will resume the true full lean and arm action of the short-distance sprinter (see Chapter II, Sketch 5). This final effort, however, must never be produced suddenly. He must gather himself together for it, otherwise he will lose his body angle, fight up and down, and possibly never reach the tape at all. Really strong runners with a great deal of staying power, but not so much fire as the sprinter proper, have got to be prepared to plug through the whole of the distance at the best speed they can muster. Sketch 3 shows excellent form at the finish of a race and exceptionally fine leg action.

On the face of things it looks as though the sprinter, developed into a quarter-miler, has the best chance of success in a quarter mile. But, on the other hand, it is often actually the case that the distance man, who has already got the staying power, can make out best at the Quarter Mile if he develops mechanical sprint ability to the highest point of efficiency, such as will enable him to get the inside berth at the first dash for premier place. Lawson Robertson, the American Olympic coach, has laid it down, indeed, that a quarter-miler can protect himself only by attacking the sprints with renewed vigour and perfecting himself with the one consistent means of defence—i.e. the power of sprinting.

Quarter-milers should study the chapter in this book which deals with sprinting. They should, indeed, actually work in training with the sprinters, but they must always remember that the forward body lean when they are striding through the middle part of a quarter of a mile need not be so pronounced as the true sprint pose they will assume in the first dash for the inside place, and again over the last 120 yards when finishing.

Speed is the first thing all quarter-milers have to aim at; in addition, the sprinter type must build up staying power. In planning a schedule of training the would-be quarter-miler can follow pretty closely the work already laid down for sprinters, but will need, in addition, plenty of good brisk walking, and a certain amount of longer distance track running.

The grown man, who does not have the boy's advantage of constant participation in games, must be prepared to face a three months' preparation. First month is all conditioning work at half or three-quarter speed, and jogging, as shown in Sketch 1. (Note arm action of leading runner.) In the second month comes pistol practice in the shape of starts and 50-yard dashes, interspersed with 150-yard half-speed striding and top-speed 25-yard dashes; the latter lengthen out until the athlete can hold his pace over a full 200 yards; 350 yards should

set the limit to the work-outs on most days of training, with full distance quarter-mile trials three or four times only in the last month and a half of training. In mentioning the 350-yard distance work-outs I had it in mind for the athlete to stride the first 150 yards at half speed and the final 200 yards at just about the best speed he can muster. If the men can manage a walk of 4 to 5 miles a day, and the boys 3 to 4 miles at about 4½ miles per hour, this will go a long way towards building up any stamina that is lacking.

For schoolboys who have only a final month in which to complete their training, the following scheme is suggested:

First Week.—*Monday:* 30 yards half speed twice, 20 yards three-quarter speed once, 50 yards three-quarter speed once, 150 yards striding half speed. *Tuesday and Wednesday:* The same. *Thursday:* 30 yards half speed twice, 30 yards full speed twice, 200 yards half speed once. *Saturday:* 30 yards half speed twice, 300 yards running, 220 yards at three-quarter speed, 80 yards almost full speed. The same schedule for the second week, with a full speed 100 yards time trial on *Wednesday* and 440 yards on *Saturday*, run at just under full speed, with the last 100 yards at full speed. Third week the same as before, but with an actual 350 yards time trial on *Saturday*.

FOURTH WEEK.—*Monday:* 30 yards half speed twice, 25 yards three-quarter speed three times, 500 yards, with 80 yards initial sprint and 420 yards striding through at half speed. *Tuesday:* 50 yards half speed twice, 80 yards dash once, 100 yards three-quarter speed once. If the competition is to be on Saturday, the athlete should drop his track-work for the rest of the week, but may do a certain number of short, brisk walks to keep himself from getting anxious about his condition.

There is one point in connection with distances beyond the actual sprints which no amount of training can teach the athlete. He must learn his lesson either in actual competition or in trials against other runners. A slight suggestion of tactics was made in dealing with the case of the runner who goes for the inside berth and is determined to stick to it, but to do this argues exceptional staying power or a mediocre field. The sprinter, therefore, must have other cards in his hand to rely upon. A particular instance, which occurs to me at the moment, was the occasion of the Oxford and Cambridge Sports in 1923, when H. M. Abrahams, after winning the "Hundred" in 10 seconds and establishing a new Inter-Varsity record of 23 feet $7\frac{1}{4}$ inches for the Long Jump, finished up the afternoon by winning the Quarter Mile in $50\frac{4}{5}$ seconds. Upon this occasion Abrahams was up against W. E.

Stevenson, the Oxford-American crack, who in 1921 had taken the American title in $48\frac{3}{5}$ seconds, and who also had specialized at the distance. Abrahams came out of his holes like lightning, made all the running to the first bend, let the others pass him, and trailed his field up the back straight. At the top of the ground he began to come through, and then, over his known distance—namely, the last 100 yards—he produced an amazing burst of speed.

CHAPTER V

THE HALF MILE

THE half-mile distance provides us with yet one more bone of contention to worry away at thoughtfully.

The performances of men like Meredith and Rudd, mentioned in the last chapter, make one wonder if it is not best to combine this distance with the Quarter Mile, especially as Meredith holds world's record at both these distances. On the other hand, there are a whole bevy of runners who have combined the half- and one-mile runs in both training and competition with the greatest degree of success.

At the Olympic Games of London in 1908 M. W. Shepherd, U.S.A., took the 800 Metres (874·9 yards) in 1 minute $52\frac{4}{5}$ seconds and the 1,500 Metres (1,640 yards) in 4 minutes $3\frac{2}{5}$ seconds. At the Antwerp Olympiad in 1920 A. G. Hill, the British Mile record holder, won the 800 Metres in 1 minute $53\frac{2}{5}$ seconds and the 1,500 Metres in 4 minutes $1\frac{4}{5}$ seconds.

A study of the physical make-up of a number of

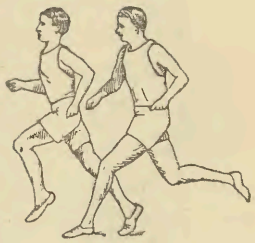
men who have gained world's championship honours at both the half- and one-mile distances gives the pick of them at an average height of 5 feet 9 inches to 5 feet 11 inches and an approximate weight of just under or just over 11 stone.

The first essential of the good half-miler is staying-power, the second speed, but neither asset by itself will bring success. Both may be mechanically built up from first beginnings, but the athlete must, in addition, acquire striding ability, and, above all, great knowledge of pace. There is, in fact, no other race in which judgment of pace *in the first half* counts for so much as in the Half Mile.

There is one point upon which all the great coaches are agreed. It is that the first quarter must be run at a faster pace than the second. Alec Nelson, the Cambridge University Athletic Club coach, lays it down that a 2-minute half mile necessitates the running of the first quarter in 59 seconds; but S. A. Mussabini, who also has produced many wonderful runners in his time, suggests a 63 seconds first quarter mile for the 2-minute man, and again a 59-second quarter mile for the 1-minute 56-second half-miler; whereas Nelson advocates running the initial quarter in 56 seconds and the second lap in 60 seconds. There are allowable variations here, but the underlying principle is the same, and such great authorities as

Ernie Hjertberg, the Swedish and Dutch Olympic coach, the late Michael Murphy, perhaps America's greatest coach, and Ted Meredith, himself a world's record holder, all agree that the runner should aim at running the first quarter mile at least 3 seconds faster than the time to be occupied for the second quarter mile of a half-mile race. It may be noted in passing that when Melvin Shepherd ran his Olympic record 800 Metres in 1 minute $52\frac{1}{5}$ seconds, and was fortunately timed over the full half-mile course, he ran the first quarter mile in $53\frac{2}{5}$ seconds and the second quarter mile in $60\frac{3}{5}$ seconds—that is to say, the initial quarter was $7\frac{1}{5}$ seconds faster than the second one.

HALF MILE (Stride Action)



Sketch I

Very briefly stated, the scheme for running a half mile is to start fast, to know and hold your pace for the first quarter mile, and then to stick to your pace as closely as possible over the second quarter mile, while reserving just sufficient power for a fast sprint at the finish. There are other things to remember—namely, to run on the rear part of the sole of the foot, with the arms swinging lightly at the sides and bent at the elbow, the feet

landing lightly on the track directly under the body. The stride action is shown in Sketch 1. Learn also how to vary the length of the stride. This will best be done by actual lap running, in the course of which occasional bursts of 150 yards are broken up by fairly slow pacing for double that distance. The runner must learn by experience the greatest length of sprint he is capable of holding.

Experienced observers who have watched many races have never yet failed to marvel at the new lease of life the half-miler seems to acquire from a sprint finish. We all know the reason, which is that the runner, who has been careful to gather himself together for the effort, brings into play an almost entirely different action to that which he has been using throughout the race. Easy hip-action has allowed him to stretch out his legs in striding, while the arms have moved with an easy upward swing. At the sprint the tired muscles more or less go out of action, and there comes into play either (see chapter on Sprinting) Mussabini's cross-arm action and foot-close-to-the-ground stride, or Paddock's lifted knee and upper-

Sketch 2.

cut arm punch action, both of which methods bring into play an entirely new set of muscles. In either case the athlete who has been running on the rear part of the sole of his foot now comes as high up on to his toes as possible, while assuming a more forward body angle. Sketch 2 shows excellent half-mile form during the middle stages of the race. Sprint finish is shown in the sketches illustrating Chapter II. Note the difference.

For the grown man, who has not the schoolboy's advantage of all-round participation in games, a three months' training schedule is necessary. But the schoolboy, with only one month to spare, must get straight down to the question of gaining pace judgment. He should begin by running 440 and 660 yards at about the pace he thinks he can hold for the half mile, and should aim at a 60-second quarter mile to start with; that will give him 660 yards in about 1 minute 35 seconds, both distances tried out at separate intervals.

As soon as the runner feels his power increasing he can work out at rather longer distances. Let us suppose that he has been able to devote six weeks to his training, and that two weeks have been occupied in the work just indicated; then he can occupy the final month on a schedule of his own based upon the following suggestions :

First Week.—*Monday:* 2 miles at half speed. *Tuesday:* Half mile three-quarter speed. *Wednesday:* 220 yards twice at three-quarter speed. *Thursday:* Three-quarter mile half speed. *Saturday:* 880 yards three-quarter speed, with final sprint of 100 yards.

Second Week.—*Monday:* 2 miles three-quarter speed. *Tuesday:* 220 yards twice three-quarter speed. *Wednesday:* 440 yards three-quarter speed. *Thursday:* Three-quarter mile half speed and one 220-yard dash. *Saturday:* One mile at almost full speed.

Third Week.—*Monday:* Two 220-yard dashes three-quarter speed and 440 yards half speed. *Tuesday:* 880 yards three-quarter speed. *Wednesday:* Two 220-yard dashes, one at three-quarter and one at full speed. *Thursday:* One mile in approximately 6 minutes. *Saturday:* 880 yards or one-mile trial, according to which event the runner is training for.

Fourth Week.—*Monday:* Half mile at three-quarter speed. *Tuesday:* One mile at half speed. *Wednesday, Thursday, and Friday:* Rest. *Saturday:* Competition.

It should be noted that the milers also, or athletes training for both distances, may quite well use the above suggestions upon which to base their own schedule. They may also read the chapters on

sprinting and quarter-miling, and introduce some of the work from those sections into their programme.

Coaches and instructors should keep the closest watch upon all their charges in training, and never allow them to exceed the pace or distance at which they have been told to work out. It is better to underwork an athlete than to run the risk of over-training him. It must be remembered that the athlete coming into training is a very highly strung individual, and that directly he feels fit he will want to go the limit. To let him do so is certain to turn him stale. He will then be inclined to loaf. The natural exuberance of fitness should be the runner's greatest asset on the race day, if it is stored up instead of being allowed to expend itself in a useless series of all-out trials.

It is not unusual in this country to see athletes, and particularly schoolboys, start the half-mile race from a standing position. It is, however, far better to crouch as the sprinters do and to make a dash for the lead, so that other runners will have to work round you when you want to drop back for the position you mean to hold until you gather yourself for the final burst of speed.

During the last five years it has been usual for the winner of the Public Schools Half Mile to produce form approximating to 2 minutes 5 seconds or 2 minutes 6 seconds. This would mean covering

a quarter mile in about 1 minute 8 seconds, 660 yards in 1 minute 36 seconds or 1 minute 37 seconds, but none the less in training, and when the sustained effort is only to last 440 or 660 yards, strive after the ideal of a 60-second quarter and a 1-minute 35-second 660 yards.

CHAPTER VI

ONE MILE AND OVER

FEW people, I feel sure, realize just how fast it is possible for a first-class athlete to run a mile. As long ago as 1895, the famous American, T. P. Conneff, covered the distance in 4 minutes $15\frac{3}{5}$ seconds, which was then world's amateur record. Since that time John Paul Jones and N. S. Taber, both of America, have returned respectively 4 minutes $14\frac{2}{5}$ seconds and 4 minutes $12\frac{3}{5}$ seconds, while the British runner, A. G. Hill, has set our own record at 4 minutes $13\frac{4}{5}$ seconds. All these men followed an orthodox scheme of training and diet and used an orthodox style; but recently there has arisen Paavo Nurmi, of Finland, who states openly that he eats what he fancies and drinks large quantities of coffee, and who yet has brought the world's record down to 4 minutes $10\frac{2}{5}$ seconds, and confidently anticipates running a mile in 4 minutes 6 seconds before he finally hangs up his spiked shoes.

In the meanwhile it is interesting to note that

since the Public Schools One Mile Challenge Cup was first instituted in 1896 the winner has only three times failed to cover the one-mile course in less than 5 minutes, while somewhere round about 4 minutes 37 seconds is now approximately winning standard.

This would argue the ability of most of the competitors in the race to accomplish a mile in at least 4 minutes 45 seconds, in which case the following intermediate times would probably appertain : quarter mile, 65 seconds; half mile, 2 minutes 18 seconds; three-quarter mile, 3 minutes 31 seconds. The Public Schools record of 4 minutes $32\frac{2}{5}$ seconds has, however, stood to the credit of H. W. Gregson, of Oundle, ever since 1900, and the time for the first-class schoolboy now to aim at is the 4-minute 30-second mile, which would mean approximately: quarter mile, 62 seconds; half mile, 2 minutes $10\frac{1}{2}$ seconds; three-quarter mile, 3 minutes 20 seconds. But we must not forget the average schoolboy winner, who at his own sports will probably do somewhere round about 5 minutes for the mile; this would mean 68 seconds for the quarter, 2 minutes 25 seconds for the half, and 3 minutes 42 seconds for the three-quarters of a mile.

Particular stress is laid upon the above time schedules, for it is only by strict adherence in

training, and as far as possible in competition, to a time schedule that the runner can hope to get the very best out of himself. The importance of timing and also of tactics may be yet further emphasized by some description of Hill's record-breaking Championship race in 1921, and Nurmi's still greater effort in 1923. A. G. Hill was up against a great miler in H. B. Stallard and a great pace-maker in Stallard's fellow Cantab, W. R. Seagrove. At the English Championships Hill drew second position from the inside, with Stallard one place away from him and Seagrove right out on the flank. At the crack of the pistol Hill went straight into the lead, closely followed by Stallard, with Seagrove coming over at tremendous speed to set the pace for his fellow Blue. Seagrove fulfilled his task admirably until half a mile had been covered in 2 minutes 4 seconds. Hill had run his initial quarter mile in $59\frac{3}{5}$ seconds, which was faster than the schedule S. A. Mussabini, his trainer, had planned for him, but the Light Blues had challenged several times, and Hill had not thought it wise to let them have the lead. During the third quarter mile there came that inevitable lull which has characterized almost every great record-breaking race, but when the bell was rung for the last lap Hill produced an electrifying burst of speed. Stallard still stuck to his man like grim death, and challenged

for the lead on the first bend, again a furlong from home, and again coming into the finishing straight; but the strength was not there—only his indomitable courage kept him running until he staggered over the line 5 yards behind the victor. Hill had kept his lead the whole way. Note now his quarter-mile times. The first lap was run in $59\frac{3}{5}$ seconds, the second in $64\frac{2}{5}$ seconds, the third in $67\frac{1}{5}$ seconds, and the final lap in $62\frac{3}{5}$ seconds. It should be noted that Hill had set out to run a level 62 seconds for each quarter mile. Could he have done so, he would easily have broken world's record by returning 4 minutes 8 seconds.

In Nurmi's record-breaking race at Stockholm against the almost equally wonderful Swede, Edvin Wide, Wide led at the quarter mile in $58\frac{5}{10}$ seconds, with Nurmi only a tenth of a second behind him; at the half mile they were running level in 2 minutes $1\frac{8}{10}$ seconds. Then Nurmi gradually drew away, returning 3 minutes $6\frac{7}{10}$ seconds for the three-quarters of a mile, and 4 minutes $10\frac{4}{10}$ seconds for the full mile. His quarter-mile times were: first lap, $58\frac{6}{10}$ seconds; second lap, $63\frac{2}{10}$ seconds; third lap, $64\frac{9}{10}$ seconds; fourth lap, $63\frac{6}{10}$ seconds. The remarkable fact about Nurmi's performance is that there was practically no falling off in his pace in the third lap, and it was here, indeed, that he ran Wide pretty well off his legs, forcing the

latter to so slow down his pace in the final quarter mile that the Swede returned 4 minutes $13\frac{1}{10}$ seconds for the whole journey. The moral of the Nurmi-Wide race is well worth studying. On the face of it it appears that Wide cut out a slightly faster pace than Nurmi desired over the initial quarter, but that the Finn had a perception of pace so finely developed that even with this derangement of his prearranged schedule he was still able to adjust his running to a practically even pace over the remainder of the distance. All this argues that the theory of the slow third quarter is wrong, and that uniformity of speed throughout the race is the thing to aim at.

It is absolutely essential that a good mile runner should be a first-class judge of pace. Many an old hand, who knows his capabilities as a sprinter, will start the race at a speed which is a regular crack-a-jack, and then, almost imperceptibly, slow down the pace after he has got the lead and wait to again produce his sprint at the finish. Even the best trained of novices may be caught napping by this perfectly legitimate device and lose a race which otherwise he would have won, if only he had had the good sense to rely on his own pace judgment and to stick to his pre-arranged time schedule from start to finish. Coaches should carefully warn their charges upon this matter before sending them out

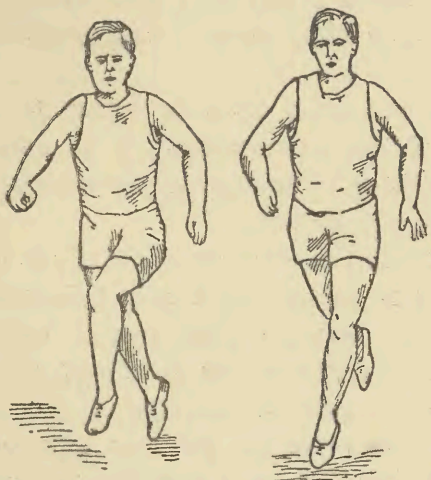
upon the track to compete. They should also see that the boys under their instruction get plenty of the sort of work which will induce proper finishing sprint ability.

Hjertberg, the great Swedish-American trainer, has laid it down that "medium distances make greater demands upon those that run them, and that it should always be remembered that no result promising ultimate great success can be reached after only one or two, or perhaps even three, years' training; but still one can notice an improvement year after year, and this should be the spur to continue training."

Michael Murphy believed firmly that the finest training for the mile distance comprised a course of cross-country running lasting from the autumn until the approach of spring. He was strongly of the opinion that this work should be done in stout shoes, woollen stockings, elongated "shorts" covering the knees, undershirt, sweater, and cap. In cold weather he insisted upon his charges keeping the mouth covered to prevent bitterly cold air going straight to the lungs. Immediately upon the conclusion of the run his pupils stripped, practised a few body-building exercises, and then took a shower-bath.

Another great feature of Murphy's training method was his insistence at the beginning of the

athlete's actual track-work that he should swing along easily until he began to tire (see Sketch 1), and then walk about the field until he felt fit for another run. After two weeks of this work the runner was asked to try himself out at a half-mile run in time approximating to 2 minutes 20 seconds, varying to



Sketch I.

2 minutes 30 seconds. In the third and fourth weeks Murphy sent his charges as much as 2 miles, varied by a few quarter-mile runs, the latter at about top speed twice a week. Upon another day he would order a one-mile spin at a fairly fast pace.

It is worthy of note that all great coaches are agreed that the mile runner must be a sure judge

of pace. Lawson Robertson, the present American Olympic coach, lays it down that "the Mile demands the essence of speed and stamina, with the distance demanding, if it is to be properly run, a condition which has no weak points." He further contends that stamina is the thing to be aimed at in early training, and says that throughout the training the athlete should "keep everlastingly at the pace idea."

The runner must learn to cover the different sections of the race according to his own ability. In competition he must never allow his opponents to run his race for him.

Statistics and the modern school of coaches agree that the first quarter of a mile is invariably the fastest, and that the third quarter is the one in which the athlete gets his gruelling; if over this third quarter mile he can hold a pace approximating to his other lap times, he will usually find his pluck rewarded by a final quarter mile which takes care of itself.

On the question of style the athlete must avoid the high pick-up of the sprinter, and allow his feet to pass close to the ground (see sketches illustrating, Chapter V). He must stride evenly and seldom vary his length. He must have sprinting ability and develop the power to respond instantly to a sudden rush on the part of an opponent. A man

who allows himself to be surprised or "jumped," to use a track term, will have to make an enormous effort to respond, and will probably fail to do so if his opponent "jumps" him anywhere in the final stretch. Never pass an opponent going round a bend.

At the mile distance, and all distances beyond it, the runner must score off the laps for himself or get a friend to shout them to him as he passes. In the Oxford and Cambridge Sports of 1924, R. S. Starr, the Cambridge crack, was misinformed by an over-zealous official that he was completing the last lap, whereas he had in reality yet another lap to go. Starr produced his sprint nearly 600 yards from home, and in consequence was unable to complete the course.

What has been said regarding the Mile stands good for any greater distance the schoolboy, collegiate, or university runner may be asked to attempt. The only difference in the preparation will be that he must accustom himself to traversing the greater journey, and he must try also to keep a sprint in reserve. With certain modifications as to distance the half-miler's training schedule should serve the greater distance man's needs.

In conclusion a word or two must be said about striding. This question is generally settled by the body build of the athlete himself. As a rule, small,

light-weight runners find a really lengthy stride makes too great a call upon their powers of endurance. To hold their length they have all the while to call upon their mental and physical reserves, which should, properly, be held ready to respond to a challenge or to produce the finishing burst of speed. This class are usually better suited by a fairly short stride with a quick pick-up, provided that they do not use overmuch arm action. On the other hand, the bigger fellows with long legs will prefer the stretch to the patter stride, working out easily from the hips and taking one stride or two to the three strides of the other class.

Throughout the race it is of vital importance to run in a state of mental and physical relaxation until such times as it is necessary to call upon one's resources for the big effort.

CHAPTER VII

CROSS-COUNTRY RUNNING

CROSS-COUNTRY running has one great advantage over distance track-work in that the latter is bound to become monotonous, whereas a spin over ever-changing country provides a pleasing variety. It is, however, advisable to run in company in preference to taking long spins by oneself.

The cross-country runner should work out three times a week over distances suited to the inculcation of stamina for the length of race he has in prospect, varying the length of his run in accordance with his own feelings. Never shirk bad going in training, and always, in practice, run strongly through the bad patches. In bad going the stride should be shortened, to decrease strain upon tendons, and strong striding is necessary, also, to prevent the chance of slipping or stumbling in thick mud. Lengthen out the stride over the good ground. It should, indeed, be easy to do this, since the chopped stride in the rough would have given a rest to the muscles employed in the proper stretching knee action. Shorten the stride and slow

down the pace a bit going uphill, come downhill fairly fast, with sufficient hold-back to prevent yourself from over-reaching.

Run over obstacles where you can, hurdle where you can't, but do not hesitate to employ a hand-vault where you are not absolutely certain of your ability to effect a clearance in any other manner. Obstacle clearance needs a deal of practice, apart from running, to ensure good form throughout a race. Cross-country runners should study the section of Chapter III which deals with low hurdling. Practise hurdle exercises as detailed for the low hurdlers, and get the hip-sockets loose. Do not bother about attempting to run up on the toes, but try to land on the rear part of the sole of the foot, with a gradual letting down of the heels as an integral part of the action. Always try to finish the home stretch in proper running form. Know the course by heart before you tackle the race; use spikes, if possible, and always have two pairs of shoes with you, both waterproofed, one pair with long spikes for soft going and the other with short spikes for hard going. Do not forget that our great opponents, the American and Scandinavian athletes, acknowledge freely that cross-country running is the fundamental basis upon which nearly all English long-distance runners of the first grade have been built up.

It has been said that cross-country running is the best kind of preparation that the track distance runner can take; conversely the real cross-country runner should remember that he also can improve his form by practising upon the track throughout the summer for the purpose of acquiring speed, steadiness, and the development of pace.

The essence of success across country lies in the ability of the runner to have his body and limbs always in perfect control, but always moving easily and smoothly. The cross-country runner should carry his arms loosely and swinging just as easily as if he were running upon a track; they are his chief asset in preserving his body balance.

Cross-country men in training will find it quite sufficient if they work out once a week across country at three-quarter speed. After their legs are sufficiently hard to resist shin soreness, they may add another two days' work to their training in the shape of steady road-running. In road work the "cracks" will look after themselves, but the beginners should be in the charge of an old hand, who will see to it that they neither overdo themselves in the matter of pace or distance nor pound along on hard pavements.

CHAPTER VIII

RELAY RACING

In other parts of this book it has been stated frequently that cross-country running is a fine fundamental for all distance work on the track, and it has also been pointed out that Great Britain owes much of her success in the distance department of athletics to our long-standing system of cross-country running. It is equally true that America owes the phenomenal success of her sprinters to the system of relay racing which has been so largely popularized in the States by the famous University of Pennsylvania Annual Relay Carnival. It is further significant that since the system of relay racing obtained popularity in this country, and especially at the Universities, we have produced, in H. M. Abrahams, the first British athlete ever to claim an Olympic sprint title.

The value of relay racing is greatly enhanced in that it provides competition for a great many runners, all of whom have to go the full distance, whereas, under the bad old handicap system, the sprinter might not be asked to run more than 90 or

95 yards out of the full 100 more than once in a season, and the half-miler, even if a good average performer, no more than 820 or 830 yards in half a mile. The consequence was that many of our athletes acquired a style of running not calculated to carry them fast to a strong finish over the full distance.

Relay teams usually comprise four runners, each one of whom covers an equal distance. The popular distances are 440 Yards (4 × 110 yards), 880 Yards (4 × 220), 1 Mile (8 × 220 or 4 × 440), 2 Miles (4 × 880), 4 Miles (4 × 1 mile). There is also the Medley Race, as practised at the English Championships, in which each of the first two runners runs 220 yards, the third 440 yards, and the fourth 880 yards. There is also the 480 Yards Hurdles Relay (4 × 120) run backwards and forwards.

Schoolboys should note that the Achilles Club, which consists of Old Blues, now promotes in April of each year at Queen's Club a Relay Carnival open to schools represented by past and present boys.

Style and systems of training have already been outlined in this book for the various track events and hurdles; we may therefore confine ourselves here to the consideration of the system and tactics of relay racing.

The first thing for the coach or team captain to

teach his relay runners is the proper method of passing and receiving the baton, which is carried and passed on by the runners from beginning to end of the race.

The special rules of relay racing require that stations for teams shall be drawn for, and each team retain its station throughout the race. Lines parallel to the side of the track must be drawn to denote stations, and also lines 10 yards on each side of and parallel to the starting-line of each relay. Failure to hand over the baton within the 20 yards zone disqualifies the team, and no waiting relay is allowed to run back of the line 10 yards behind the starting-line to relieve the approaching relay, nor is any member of a team allowed to run two relays. It is customary for the baton to be not more than 11·81 inches in length, and not less than 1·769 ounces (50 grammes) in weight. Teams should always practise with the proper baton, otherwise the official baton will feel strange in the hand upon the day of competition. They must also learn to pass the baton from one to the other with perfect sureness, for an ineffective pass may mean the loss of from 1 to 5 yards at any of the exchanges.

Before detailing the makings of success in relay racing let us consider a few of the points upon which a race may be won or lost.

In the first place, the coach or team captain has got to consider carefully the order in which he is going to arrange for his team to run. The normal system is to keep the fastest man for the last relay, particularly if he be one of those big-hearted fellows who show to the best advantage when confronted with the hard task of overtaking a field that the preceding relays of his own team have let get out of hand. Sometimes, however, the best man should be kept for the third relay, in order that he may break up the opposition and send the last of his team mates on the final stage of the journey with a substantial lead. The second fastest man is almost invariably picked to run the first relay, on the theory that it is wise to set up a second relay lead if possible, so that the two middle runners may at least have a good chance of sending the last relay off on even terms with the opposition.

From what has been said it will be seen that the runners in a relay team should be interchangeable, so that the coach or captain may readjust the order of running, even at the last moment, in accordance with his opinion of the opposition.

At the beginning of training it is a good thing to lay down a hard-and-fast rule that every member of the team must acquire proficiency in receiving the baton in the right hand, shifting it to the left within the first 50 yards and passing it from

his left hand to the right hand of the waiting relay.

One justly famous English trainer has definitely laid it down that the first man should start with the baton in the right hand and pass it to the next man on the inside, putting the baton into the receiver's left hand. The second man, it is suggested, should carry the baton in his left hand, come up on the next receiver's right, and place it in the waiting relay's right hand. The inference is that the alternating method of handing over will save the relays from shifting the baton from one hand to the other. This scheme is not supported by the best of the foreign or the other British coaches.

Pace judgment is of the greatest importance to the relay runner. The first relay, which will start from the sprinter's crouching position (read Chapter II and study the sketches), must come out of the holes at top speed in the hope of holding or gaining the inside berth; subsequent relays start from the standing position, and it is to them that the judgment of pace is so vitally important. When a man, waiting anxiously for the incoming relay, sees other men of his own section going away from him, there is always a tendency to cut loose the moment he has received the baton, in a thrilling attempt to overtake the lead runners. If this

temptation is yielded to there is a fine chance that the man will run himself off his feet in the first 200 yards. It should be remembered that it is not necessary to overtake the lead runners in the first 150 yards of a relay.

A fruitful source of disqualification is the tendency of runners waiting at the rear of the 20 yards zone to step back over the line to receive the baton. It is better to wait a little in advance of the rear 10-yard line than to risk crossing it in one's anxiety to relieve the incoming runner.

The crouch start has been already described in the chapter on sprinting. It is necessary to remember, however, that the first relay holds the baton in his left hand. He must, therefore, exercise a little ingenuity to get the full support from the tripod finger-spread. Most runners favour the gripping of the baton in the fork between the thumb and forefinger, but athletes whose fingers are short will find it more convenient to rest only the first and fourth finger upon the track, thus allowing the two middle fingers to support the baton with a firm grip. This method has one grave disadvantage, in that the forward disposition of the runner's weight mainly rests, as he crouches, upon the right hand, which may result in his coming out of the holes slightly lop-sided.

Whether a stationary start or running start is

used in the intermediate stages depends largely upon the distance of the race. For example, at longer distances the loss of a yard or two at the start of each relay is not of vital importance, but in any case it is a matter for the coach or team captain to decide just prior to the race which style is to be used.

Each man in the team must be taught to finish up his own relay with the correct sprinter's forward lean, as this facilitates handing over, and he must learn to come up on the right of the receiver. The receiver should watch his incoming relay, judging his pace and adjusting his position to the stride of his team mate's approach. Obviously, the man who is arriving in an exhausted state must be waited for. When a strong finisher is approaching, the receiver can set himself going and be well on the way when he takes over, provided the exchange is made within the 20 yards zone. Generally speaking, an exhausted incoming relay must hand over in the first half of the zone, whereas a strong finisher allows the outgoing relay to start his sprint in the first 10 yards and hands over to him in the space of the second 10 yards. This, however, is all a matter of timing. The ideal is found when both runners are in the proper forward leaning position as the hand-over is affected, but this predicates that the receiver shoots a quick glance at the passer, to

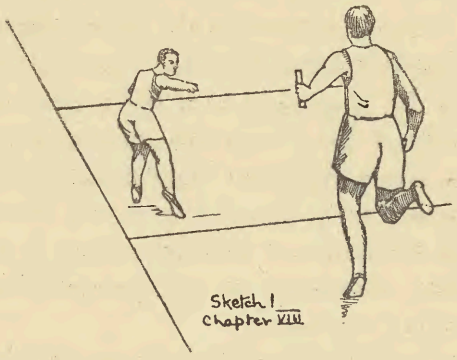
judge his position, and then runs on with head straight to the front and the receiving right arm stretched behind his shoulder (palm and elbow uppermost), at an angle of about 45 degrees.

The passer should hold the baton at the lower end and the receiver should grasp it at the upper end. Within the first 50 yards he transfers it to his left hand with an over-arm action, so that the back of the hand is towards the body, thus enabling the left hand to again grasp the baton by the lower end ready for handing it over to the next receiver. The runner of the final relay obviously need not shift the baton from the right hand to the left. The incoming relay should cultivate a full forward stretch of the arm and shoulder, within such limits of his own exhaustion as will preserve him from falling if he is leg weary.

The responsibility of effecting the transfer rests upon the incoming relay. He should aim for the receiver's arm, bringing the baton from an upright position and gradually swinging it down into the receiver's palm ; he must, however, make absolutely sure that the man who is taking over from him has a firm hold of the baton before he himself lets it go. It is best to pass the baton from the right hand to the left directly it is received and in a single movement. In any case the runner should shift it from one hand to the other within a space of 50 yards,

the principle being that he is fresh at the outset of his relay, and therefore less likely to be thrown off his balance, or to have his striding interfered with by interrupted arm action, than would be the case towards the end of his particular relay, when the fatigue strain is beginning to tell upon him.

The waiting relay obviously cannot start with



the sprinter's crouch. He must use a standing position, and it must be a firm one. The right foot should be about 12 inches to the right of the left foot, the toes should be turned slightly outwards, and the right foot pressed firmly on the track (see Sketch 1). The incoming runner should stick to a straight-ahead course during and after the exchange. This will prevent him from impeding his successor or running into the members of other teams in the race.

It is worth remembering that the receiver who gets away fast is actually at that second competing against an exhausted finisher of another team, and that a quick pick-up by the receiver will gain his team many additional yards' start at the commencement of the particular section of the race.

In training, short bursts in which the runners exchange the baton time and again are all important. They should also be practised just before the competition. The instructor, or team captain, should, as far as possible, run his men to schedule in trials, and, indeed, accustom them at all times to judge their own pace and the finishing pace of the incoming relay. Another thing that the team must be taught is how to "jump" their opponents. Each man should strive during the race to work himself into a strategic position and then go past his opponent at the top of his speed. A short burst of this sort should occupy about 10 yards, and may subsequently save the runner a gruelling fight for the lead sustained over 50 yards at a slower pace.

There is only one time when it pays to abandon schedule running—that is, when the instructor, or captain, is not absolutely certain that the team can go the distance. In such a case it is best to advise each man to make the most of his running from start to finish, in the hope that the fastest man, who has been kept for the final relay, will get such a lead

handed over to him as will enable him to clean up on an opponent well known to be much speedier than himself.

The instructor, or team captain, should design his trials during training to show up the gameness or otherwise of his men, for it is " guts " that tells in relay racing, and a slightly slower man who has them is to be preferred to the flyer who is liable to quit when he finds himself up against a really tough proposition and faced with the necessity of cutting down a halter-long lead.

CHAPTER IX

THE STEEPLECHASE

STEEPLECHASING has always been a popular English sport, but in the past the race was run at all sorts of distances and over all kinds of obstacles. To-day the standardized distance for boys as used at the Public Schools Sports Meeting is three-quarters of a mile. The record is held by V. E. Morgan, of Charterhouse, who in 1923 covered the distance in 4 minutes $3\frac{3}{5}$ seconds. A good winning performance, however, would appear to approximate to 4 minutes 20 seconds. The A.A.A. and English Championship distance is 2 miles, and the record of 10 minutes $57\frac{1}{5}$ seconds was established by Percy Hodge of the Surrey A.C. in 1921. At either distance there are four hurdles and a water jump in each lap. The hurdles, and also the fixed hurdle at the water jump, which is bushed, are 3 feet in height. The water jump is 12 feet in width and 2 feet 6 inches in depth at the hurdle end, but slopes to the level of the field at the farther end.

In this event it is necessary that the runner

should be a good judge of pace, a good hurdler, and able to take the water jump in correct form ; he must certainly be possessed also of considerable staying power.

The athlete who thinks of going in for steeplechasing should study the chapters of this book dealing with half-mile and mile running, that part of Chapter III which deals with low hurdling, and should also practise the hurdler's exercises, except those designed to produce the high hurdler's exaggerated body dip.

Steeplechasers should run to time schedule and endeavour to preserve uniformity of pace until they begin to stretch out in the final, or possibly the last two laps. Never should they on any account allow a " heady " runner to lure them into breaking the uniformity of stride for the sake of mixing it up in a series of spasmodic sprints. Not only will such a practice completely use up the reserve of power which should be conserved for the finishing spurt, but it will also prevent them striding evenly between obstacles, and will cause them to chop the stride unnecessarily as they approach such obstacles and to clear them in such bad form that they will either stumble into them or, having crossed them, land with a bad backward lean, which again will upset their striding evenly through to the take-off for the next obstacle.

The hurdles must be taken smoothly in the stride with a step-over action and without loss of the proper body angle applicable to running (see section of Chapter III dealing with Low Hurdling).

It is bad policy to attempt to clear the water jump in one bound. It is possible to do it, of course, but the effort is so great that the subsequent running will be adversely affected. On the other hand, it is equally a mistake to stride over the bushed hurdle in such a way that one drops into the deep water immediately beyond it. The best method is to increase the pace as one comes within 10 or 12 yards of the water jump, and to use just so much effort in the clearance jump as will land one into the water about 2 feet from the far edge of the up gradient, the landing being effected with one foot slightly ahead of the other, so that the weight of the body falling forward will swing one smoothly on into the next stride on to dry turf. Do not, however, make the mistake of landing upon one foot only.

This is a gruelling race, and one for which the athlete must build up his powers of endurance. If, in addition, he can cultivate a finishing sprint of about 120 yards, he should undoubtedly hold a winning hand.

PART TWO

FIELD EVENTS

CHAPTER X

FOR GAMES MASTERS AND COACHES

We now come to the consideration of perhaps the most difficult section of athletics. Every time the athlete goes out to train he will want to see just how brilliantly he can perform, and just so often as he does this he will inevitably impair his chances of achieving ultimate success.

Apart from individual ability and aptitude, success in the field events is all a question of accurate timing and the dovetailing of muscle movement.

At the very commencement it should be stated that it is practically impossible for the field events man to train alone. The best plan of all is to work under the eye of a field events expert. Failing this, one must train with a brother athlete, both having acquired book and pictorial or ocular experience of technique, so that the one may watch the other at work and each in turn act as finder of faults and detector of improvement in technique.

The instructor of field events men must set himself the task of seeing that his charges practise

for style practically the whole time. Failing the assistance of an instructor the athlete must himself prepare a training schedule and stick to it.

Pole vaulters and high jumpers must train only at such heights as they are absolutely sure of clearing; but an occasional try-out for height is allowable, as it enables the athlete to see what sort of progress is being made. Javelin, discus, and hammer throwers must keep within the compass which allows them to retain the correct form. The moment the field events man discovers that style is being sacrificed to the expenditure of strength or speed, he must revert to light work for style. In this way it will be found that each week one can throw a little farther or jump better while still retaining one's style; and so, by degrees, technique becomes second nature, and the maximum results of which one is physically capable are at last attained.

Many field events men make the mistake of believing that they have only to practise actual throwing or jumping to attain proficiency. They are, however, strongly advised to study the remainder of this book dealing with track and cross-country athletics. It is essential that they should build up their stamina by long, strong work, and gain speed, fire, and "snappiness" by a certain amount of sprint work. For example, I know one

noted javelin thrower who owes his success in no small degree to the body-building preparation he undertakes. Personally, I think this particular man rather overdoes things, in that he runs four miles at a most unearthly hour of the morning when most of us are still in our beds, and another four miles late at night when his day's work is finished; but he has the root of the right idea, and, in his particular case, this very strenuous sort of training seems to suit him.

Again, it must be remembered that practically the whole of the field events are practised within certain very definite limits of space, and therefore the field events man must cultivate that exact degree of accuracy which it has previously been pointed out is the first requisite of the high hurdler's outfit.

In the field events the question of impedimenta and equipment looms very large.

Shoes require careful consideration, and in every case should be equipped with heels in which two spikes are set diagonally. There are, of course, six spikes in the soles. Jumpers need fairly light shoes; pole vaulters should have special pole vault boots cut ankle-high. The throwing men, including the shot putters, need an altogether stouter shoe with a fairly wide sole, which curves up slightly on either side from the centre line, and

wide, well-spiked heels. The shoes should also be fitted with ankle-straps. In England most field events contests take place upon grass, and therefore the man who can afford them should possess three pairs of shoes—those with long spikes for soft, wet grass, those with medium length spikes for normal turf, and those with short spikes for hard, sun-dried turf or for use on good cinders. Upon cinders, however, it may sometimes be necessary to use the medium length spikes.

There is only one sort of gear for the field events man to use, and that is the very best obtainable.

The pole vaulter, for example, should never allow himself to be persuaded to vault with anything but a female-bamboo vaulting pole of suitable length, whipped about with medical adhesive strapping to give him hand-hold. The use of an ash or hickory pole is suicidal. In the first place, such a pole is liable to snap transversely and impale the wretched athlete; secondly, its very weight will prevent him from producing his proper form. Discus throwers should see to it that they get a discus according to Olympic specification; many British firms are still supplying the bad, out-of-date disci which were in use at the London Olympiad of 1908, but which have long since been condemned by the authorities. The same applies to javelins. Some firms will fob you off with whippy, ash-shafted

weapons that have an entirely wrong hand-hold and will not fly so far by 30 feet as the proper stiff-shafted spears which are made from the best sunside layers of the Finnish birch-trees. Hammer throwers should see to it that their hammers are of the proper swivel-headed, ball-bearing variety, shafted with piano-wire, and having the sort of handle, or handles, best suited to the individual's own requirements.

In the case of hammers and shots, it is as well to repeat that these are made in three weights. The 8-lb. shot is for the use of boys under fifteen ; the 12-lb. shot for boys between the ages of sixteen and eighteen ; and the 16-lb. shot intended only for fully grown, well-developed men. Hammers are made in the same weights, but no boy under fifteen years of age should be allowed to touch one, and even boys under eighteen years of age should never attempt to throw a hammer weighing more than 12 lb., and that only in the greatest moderation. The 16-lb. hammer is for the mature athlete.

The use of the 16-lb. hammer and the 16-lb. shot should be at once discontinued at our Public Schools ; firstly, because such a weight wielded in such a manner puts an unnatural and dangerous strain upon an immature athlete ; and secondly, because it is impossible for a youngster to acquire the correct technique if he is forced to practise and

compete with implements the weight of which is beyond his strength.

Any schoolmaster or coach who allows a boy to use a weight unsuitable to his age and strength is not fit for the task he has undertaken as mentor to schoolboy athletes.

In a lesser degree the same applies to javelin and discus throwing.

Standardized impedimenta for the use of youths can be obtained from such firms as Messrs. A. G. Spalding and Brothers, High Holborn, London; and it will be found that boys who are given a 3-lb. discus to play with very soon attain amazing results, whereas they would spoil their form with a $4\frac{1}{2}$-lb. implement; and equally is it the case that a boy who throws well with a short javelin is bound to lose his form if he tries to throw the $8\frac{1}{2}$-foot man's spear, the length of which it is beyond his power to control.

Coaches and games masters should see to it that the jumpers always practise with a proper run up and land in sand-pits; the long jumpers must have a proper take-off board, which should measure not less than 4 feet in length, 8 inches in breadth, and 4 inches in depth. Shot putters, discus and hammer throwers should work from the appropriate circles, and javelin throwers from behind a proper scratch line.

If boys do not learn in practice to throw from the circles or from behind a scratch line, nor the jumpers to hit their take-off accurately, then it cannot be expected of them that they will not foul when the rules compel them to do these things properly in competition.

It is a point for athletes and their mentors to remember that the system of digging a small trench in front of the long jumper's take-off board has now been done away with. The take-off board is sunk flush with the ground, and over a width of 4 inches in front of the board—that is to say, on the side nearest to the landing-pit—there is sprinkled soft earth or sand to a height of a quarter of an inch, which enables the judges to immediately detect any fouling on the part of the athlete by overstepping the outer edge of the take-off board.

CHAPTER IX

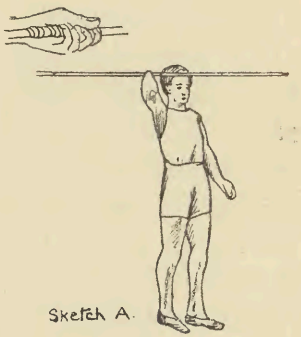
JAVELIN THROWING

JAVELIN throwing is a sport which has rapidly risen to popularity in Great Britain since it was first introduced to us by Scandinavian athletes at the London Olympiad in 1908. More recently, throwing with a weapon of lighter weight and shorter length, the sport has been taken up keenly at some of our public and secondary schools.

The javelin is a spear of wood with a sharp iron or steel point. It is constructed in such a way that the centre of gravity is not longer than 1·230 yards nor shorter than 2·953 feet in rear of the foremost point of the steel head. About the centre of gravity there is bound a whipcord grip, 6·3 inches broad, and not exceeding the circumference of the shaft by more than 0·984 inch. The length of the full-sized weapon is not less than $8\frac{1}{2}$ feet and the weight not less than 1·6 lb. Lighter and shorter weapons are made for the use of youths.

In throwing, the javelin must be gripped at the whipcord binding.

When the hand-hold is taken, the binding lies diagonally across the palm from the root of the index finger to the heel of the hand. It is held in place by the grip of the thumb and first finger at the side and back of the binding. The other three fingers lay across the binding to aid in direction, but do not exert a tight pressure. As the throw is made the directing fingers loose their hold, so that they do not tend to pull the javelin downwards. The thumb and fore-finger give the final impetus.


Sketch A.

Sketch A shows the position taken up by the athlete prior to the run-up for the throw. The inset shows the method of grasping the binding. It should be noticed that the arm is bent in such a way that the hand is close to the ear and that the javelin is held directly forward in the direction of the run and throw with the steel head of the weapon some 3 or 4 inches lower than the tail.

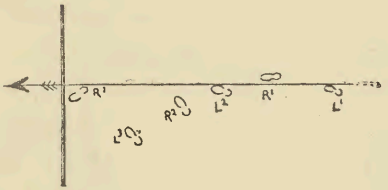
Throwing takes place from behind a scratch line properly marked upon the ground by a line $2\frac{3}{4}$ inches wide and not less than 12 feet in

length. This line must not be touched or crossed until the javelin has struck the ground. The length of the throw is measured at right angles to the scratch line or the scratch line produced, and the point of the weapon must strike the ground before any part of the shaft. Each competitor has three throws, and the best three competitors are allowed three more throws.

The length of the run-up is unlimited, but the athlete should so modify his speed that he is able to keep perfect control of all his movements and at the same time make full use of the strength of his body, legs, and throwing arm. The usual length of run is either just over or just under 20 yards. It is as necessary for the javelin thrower as for the jumpers to carefully plan, measure, and practise the run-up so that the steps fit in accurately from the start to the throwing-point. Formation of run-up is described in Chapter XV. If the run is made at random the thrower will be bound at times to overstep the scratch line, and, also, will throw with lack of proper control. The run should be practised and practised until it is made with absolute mechanical precision. The speed should be built up gradually by practice. In competition the speed should increase progressively throughout the run, so that it reaches its maximum at the transition stage, when the throw is commenced

(Sketch D). The steps should be short and springy, with the body relaxed, but yet held well together and in perfect control.

In the Swedish method of throwing, which we are now considering, the athlete's chief trouble in the run-up lies in the difficulty of leading the javelin smoothly back over the shoulder while increasing the speed just prior to the throw. Five or six steps before the scratch line is reached the



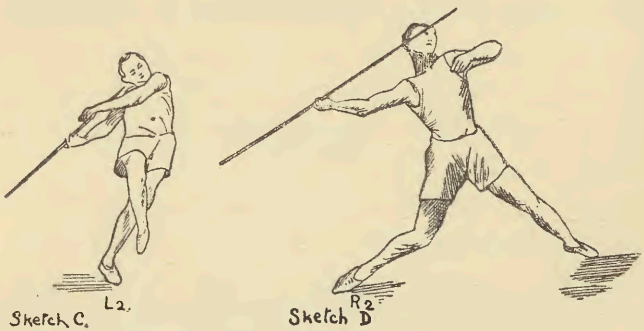
Sketch B.

thrower draws the javelin smoothly back over the shoulder until the arm is perfectly straight, at the same time the arm and back are bent backwards. The whole movement occupies three steps while the athlete is travelling at top speed, and must yet be executed perfectly smoothly. The last step before the transition to the commencement of the throw is shown in Sketch C.

The footwork is shown in Sketch B, the body movement in Sketch C. Particular notice should be taken that the javelin and fully stretched arm have not been allowed to fall below the plane of

the shoulders and that the point of the javelin has not been allowed to tilt upwards.

The commencement of the carrying off of the left foot to the position L3 (Sketch B) brings the athlete into the proper throwing position, shown in Sketch D. Just before the left foot comes firmly down on to the inner side of the sole at L3, to form a firm point of resistance, the throw commences.



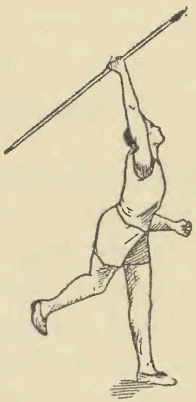
It should be noted that the foot position, L3, is about 3 feet 6 inches behind the scratch line and at an angle of about 20 degrees to the line of approach.

The right foot must be placed hard down in the third throwing step, R2, and likewise the left at L3, since it is necessary to have perfect foothold if one is to get strength into the throw, which must be supported from below by the legs, body, and shoulders.

The throw itself needs accurate and careful description by the author and equal painstaking practice by the athlete.

An instant before the left foot takes the ground at L3 the throwing arm is bent strongly backwards over the shoulder (see Sketch D). This movement, combined with the subsequent upward raising

Sketch E.



F

of the body, has the effect of elevating the javelin *after it has left the hand.* It will then, after having traversed a third of its flight, have reached the maximum height, and will lie horizontally in the air. It is of the greatest importance to remember this point.

The bending of the arm over the shoulder directs the javelin close to the head (Sketch D). As the

left foot is placed forcibly upon the ground (Sketch E), the legs and back are equally forcibly extended upwards and forwards with the best speed the athlete can encompass. The arm effects the throw at an angle of approximately 45 degrees, and the body and shoulder are pressed well up and after the arm. Care must be taken to straighten up the left leg and to throw the weight of the body well on to it; none the less, the body must not be drawn to the left during the throw, but must move forwards and upwards under the javelin (see Sketch F).

Directly the arm has finished its forward pull and the shoulder has reached its maximum forward position, the fingers loosen their grip (Sketch F), opening out so that the palm of the hand lifts the javelin and is pointed in the direction of the throw. During the backward movement, forward pull, and flight the javelin must all the while keep a perfectly straight-ahead course (Sketches C, D, and E). The novice will find in himself a strong tendency both to carry the hand out from the shouder, so that the point of the javelin is directed to the right, and to lower the extended arm below the proper shoulder plane, but the javelin must follow its proper path both forwards and upwards, which it cannot do if the point is deflected either to the side or too much upwards. It is equally necessary

that the body weight should go into the throw, by pressing the right shoulder quickly and forcibly upwards and forwards after the javelin, otherwise the leg drive will be lost. This drive should continue in a straight line forward and upward.

If no instructor is available, two men should work together to perfect their form at this event. The faults for which the coach should watch are as follows :

Point of the javelin tilted up too much during the run, or suddenly taking that position during the throw.

Lack of running speed or sudden check before the throw is made.

Arm drawn back with a jerk or not fully extended. Arm falls below the proper shoulder plane. Arm reaches full extension too soon, and there is a consequent break in the rhythm of arm movement before the throw begins.

Javelin is directed to the right, and the throw is not made *over* the shoulder. Body breaks away to the left from the throwing arm. Watch for these faults from behind.

The arm is not bent back over the shoulder before the left foot takes the ground. The foothold is insecure or the reverse of the feet takes place too early. The backward bend of the body causes the athlete to place his feet so far apart that he finds

it impossible to raise his body up to its full height upon the stiffened left leg (Sketch F) during the throw. Watch for these faults from a position to the right of the athlete.

Note.—Immediately the hand releases its hold of the javelin the right foot should be drawn forward, landing at R3 (Sketch B) to take the thrower's weight and restore his balance (see Sketch G).

G

The javelin thrower's training should combine a certain amount of 50-yard sprinting with a good deal of walking and some distance jog-trot runs to build up stamina. His muscles should be strong and quickly responsive, and his joints should be loose. Strength he must have, but he must never sacrifice his speed of muscle movement and suppleness to the building up of big muscles. Quality rather than quantity is to be desired in this respect.

His actual work with the javelin should comprise some correct running throws without much force and constant practice of the correct hand-hold.

Practise the position of the throw, the attitude and movements of the body, and the forward carriage

of the javelin as if it were a drill by numbers. Get the coach, or a fellow-athlete, to stand behind you while you make some light throws, telling him to watch the javelin all the time so that he can be sure that it follows its proper path and that you yourself effect the throw directly *over* the shoulder. The hand should pass quite close to the head. Practise the eight steps which will bring the left foot to L2 (Sketches B and C), the stage just before the throwing position is taken up, and in doing so practise also the smooth drawing back of the throwing arm. Try for the high step-over action shown in Sketch C, which carries the right foot to R2, 18 inches to the left of direction line (see Sketch B).

Until the style is properly worked in, practise light throws only, with an eight-stride approach. Longer throws may be gradually built up as the speed and power increases, as it will do almost imperceptibly. Exercises for loosening and strengthening the shoulders should be used, and work with the punching-ball will help to add speed to one's delivery.

When one has mastered the proper technique of the throw, then the attention may be concentrated upon acquiring length of javelin flight.

With the exception of one day's rest, training may be continued all the week, but not more than

fifteen or twenty throws should be made each day. Once a week, after the style is worked in, long powerful throws may be practised.

It is suggested that one day should be devoted to building up speed in the throw without too much force in the final delivery. Another day try for lightness and quickness of footwork combined with a fairly strong throw, or again concentrate upon full speed in the running and footwork, but conclude each run with only a gentle throw. In training use a supple-shafted ash javelin, as this does not tire the arm. In competition always use a weapon shafted with stiff Finnish birch; this will fly fully 30 feet farther than the more whippy variety.

Stiff javelins and bad throwing upset the elbow and shoulder; if these joints become painful they must be treated with hot fomentations and massage.

Always, and especially before competition, have the arms massaged and otherwise warmed up by some gentle throws before attempting a full strength throw.

Train in throwing on bad as well as on good ground, as we are expected to perform on all sorts of pitches in English competitions at present.

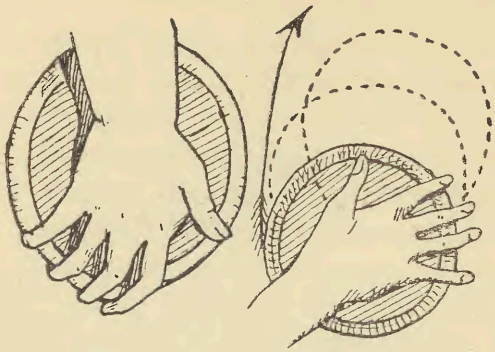
CHAPTER XII

DISCUS THROWING

THE first attribute of a good discus thrower is a keen sense of rhythm. It is, in fact, a point worthy of note that most discus and hammer throwers are extremely good dancers, just as many javelin throwers are very efficient tennis players.

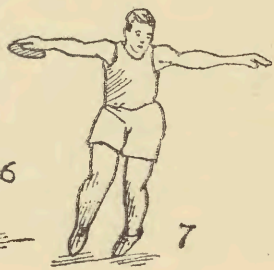
Discus Throwing is another event which was introduced to us by the Scandinavian athletes at the London Olympiad of 1908.

Throwing takes place from a circle 8 feet $2\frac{1}{2}$ inches in diameter, and all throws to count must fall within a 90-degree sector marked upon the ground. The thrower, after having entered the circle, must not, with any part of the body, touch the ground outside the circle until the discus strikes the ground. Nor must he step upon the circle. Each competitor has three throws, and the three best competitors are allowed three more throws. The full-sized discus is $8\frac{5}{8}$ inches in diameter and weighs 4 lb. 6·4 oz.; it is $1\frac{3}{4}$ inches thick through the centre, tapering down to $\frac{1}{2}$ inch at a $\frac{1}{4}$ inch from the outer edge; both surfaces must be smooth and



A. B.

Sketch 1.

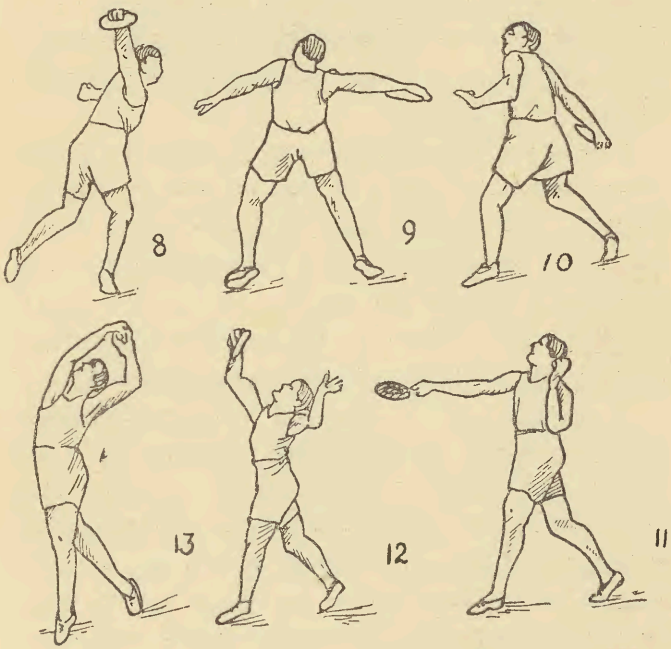


free from indentations. The whole implement is enclosed in a smoothly rounded metal rim forming a true circle. Lighter and smaller discs are made for the use of boys. The best implements are made from Finnish birch and can be obtained from A. G. Spalding and Brothers, High Holborn, London. It is well to be sure that one is equipped with the official pattern discus.

One of the first difficulties with which the novice discus thrower is faced is that of how to hold the discus. The size and shape are such that it can in nowise be gripped, but must be maintained in the hand resting upon the upcurled tips of the fingers (Sketch 1, A), and held in position by the centrifugal force set up in the turning and swinging movements.

A careful study of Sketch 1 will reveal the fact that the fingers are not widely separated, as is the custom of so many British discus throwers, and that the thumb is kept comparatively close to the index finger instead of being spread out at right angles to it. Three other points to bear in mind are that the tip of the thumb should come level with the rim of the discus, that the fingers are sloped slightly backwards, as shown in Sketch 1, A, and that, throughout the whole evolution, the rim of the discus farthest from the fingers should rest entirely against the forearm just above the wrist. This latter feature is well exemplified in the drawings

of Niittymaa, the great Finnish thrower, which illustrate this chapter. Even in Sketch 10, when just about to make delivery, he has kept the discus in its proper place.



Sketches 2 and 3 show the positions in the preliminary swinging which is used to generate momentum for the turning movement which is just commencing in Sketch 4.

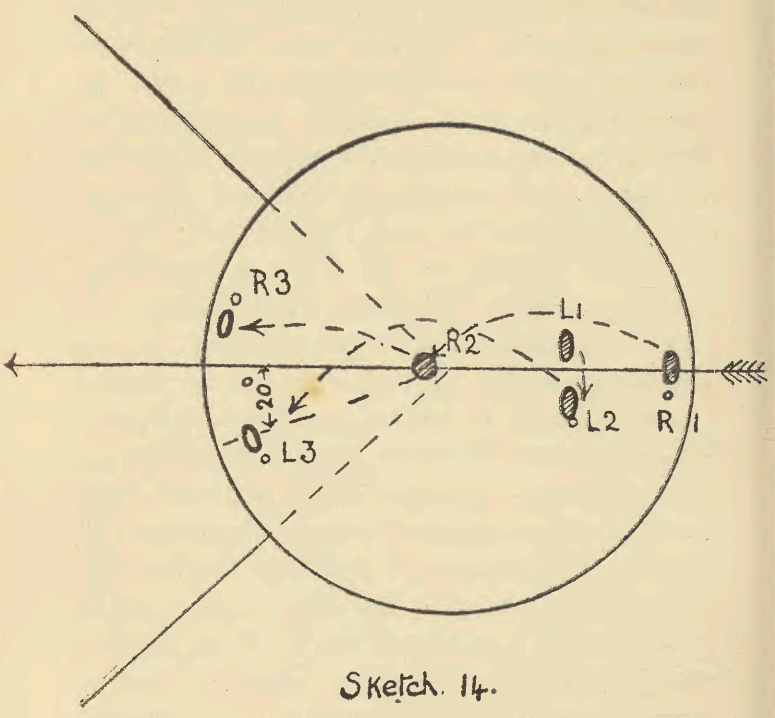
The space in which the turn may be accomplished is limited to the size of the circle 8 feet $2\frac{1}{2}$ inches in

diameter. It will be seen from Sketch 14 that the circle is crossed in one complete turn, at the conclusion of which the left foot is carried off to the left front at an angle of 20 degrees to the direct line across the circle. Sketch 8 shows that the actual throwing movement commences just before the left foot is finally placed forcibly upon the ground. The thrower must be particularly careful to start the final forward arm swing for the throw just before the left foot takes the ground at L3 (Sketch 14).

Further analysis of the thirteen sketches of Niittymaa will show that during the turning movement the arms and body move in a series of rising and falling waves. He thus arrives in the position shown in Sketch 10, well crouched for the upward leg drive which lifts him to his full height, with a stiffened leg as a point of strong resistance when the discus leaves the hand, as shown in Sketch 11.

The discus thrower is particularly advised to "make haste slowly." The steps of the turning movement must fit in accurately. If the thrower attempts at first to turn fast or in any way at random, he will foul by stepping on or going out of the circle, he will also end up by throwing hurriedly and with lack of proper body control and delivery force. In short, the turn must be practised slowly, first, without the discus, and then with it, until can be accomplished fast and with absolute mechanical

precision. The speed must be built up gradually. In competition the athlete's acceleration should increase from the first turning movement until it



Sketch. 14.

culminates in the actual throw at the instant of the final grounding of the left foot (Sketch 9).

Sketch 14, R1 and L1, shows the position of the athlete's feet as he stands swinging the discus, as shown in Sketches 2 and 3. When he commences to

turn (Sketch 4) the left foot is shifted back just before the turning movement begins to L2. The body is bent and the arm brought down to shoulder level as he begins to turn (Sketch 5). During the turn upon the left foot the discus hand comes down to the level of the knees (Sketch 6). In Sketch 7 the athlete has arrived facing the left side of the circle and has placed the right foot down at R2, and the arms have again risen shoulder high. Here he must be prepared to hold a longer spin on the ball of the right foot than he has just held upon the left foot, and, for this purpose, must poise his body slightly forward, allowing the throwing arm to swing well up above and behind the shoulder (Sketch 8), otherwise he will never get his left foot around to L3. If he should shorten his spin, so that the left foot comes down on the centre line, he will block the full extent of the final body twist and full arm delivery (Sketch 11). Just as the foot is about to be placed forcibly upon the ground at L3, with toes turned slightly inwards, the throwing arm begins to swing round and down. It is level with the shoulders and the throw has commenced when the foot is grounded and the left arm also is contributing to the swing (Sketch 9). The discus hand drops still lower and the knees are bent, while the left hand acts as a balancer (Sketch 10). It should be noted that the throwing arm does not

come forward until the right hip is well up and the shoulders square to the front (Sketches 10 and 11).

In Sketch 11 notice that the body is upright and the left leg properly straightened out and stiffened up and that the thrower is apparently making a low delivery. This is because discus throwing calls for what looks like a low altitude in preference to a higher angle, because height (of a certain sort) automatically lessens the distance of flight since the flat face of the discus must fly face on to the air before the maximum height in flight is reached, instead of cutting its way through the air edge on. Here, however, as in javelin throwing, we come upon a feature which is hard to understand and harder still to explain. It is, however, a fact that the holding back of the right arm as shown in Sketch 8, combined with the upward raising of the body (Sketch 11) and the pressing of the shoulder and body up and under the discus (Sketch 12), and the completed follow through (Sketch 13), tend to make the discus elevate after it has left the hand. It will then reach its greatest height at about a third of the distance of flight, rising through the air very slightly uptilted, and will thereafter fly absolutely flat for quite a long way before finally pitching steeply earthwards. It will be seen from Sketches 12 and 13 that the weight of the body is fully trans-

ferred to the left leg after the discus has left the hand. Many discus throwers hold the position shown in Sketch 13 until the discus has come to ground, others reverse the feet, so that the right foot is drawn through to the position shown in Sketch 14, R3. Sketches 10 to 13 show the manner in which the thrower drops back his head to aid him in giving the discus proper elevation during its flight. It should also be observed that throughout the turning movement the arms are swung fully extended from the shoulders. They are swung *loosely*, with muscles relaxed until the actual throwing movement commences just prior to the grounding of the left foot (Sketch 9), when all power is gathered for the throw.

Fig. B of Sketch 1 shows the way in which the discus leaves the hand, with the fingers imparting to it a very strong spin from left to right, which will serve to make it "scale," or fly gyroscopically flat, through the air. This spin should be set up first by the little finger, all the rest participating in turn, and the index finger giving the final impetus. This index-finger movement is important, as a final impetus imparted by all the fingers at once makes the discus fly unevenly through the air.

The training of the discus thrower necessitates the development of the turn and the throw as two absolutely separate exercises at first.

In learning the turn it is no bad thing to chalk out an 8-foot 2½-inch circle upon one's bedroom floor, with a line running straight forward through the centre. Learn the turn at "walking or slow-motion film pace" first. See that the left foot shifts back across the line from L1 to L2 just as the turn commences; do not hold the spin on the left foot so long that the right foot goes beyond the centre line R2 before it is put down, otherwise you will get the 20 degrees of the final angle with the left foot somewhere about the position of R3 instead of properly carried off to L3, and this will completely block the forward throwing movement. Learn to hold the spin on the right foot at R2 sufficiently long to allow the left foot to come around to L3. Gradually build up your pace as you go along until you can accomplish a smooth, spinning turn at fair speed.

In conjunction with the foregoing work, which can be done indoors if desired, commence some outdoor discus swinging and light deliveries from a stationary position, working on Sketches 2 to 5 and 10 to 13 inclusive, leaving out Nos. 6 to 9 for the present. Make sure of all your positions and see to it that you get the discus away from the hand with a proper finger-spin, so that it will scale in flight through the air. After awhile try some strong standing throws without turning. When you can turn fast and accurately and throw hard and accu-

rately, begin to knit the two movements together, but do not try for immediate results, or you will get a horrible shock, for you will probably find that you cannot throw as far with the turn as you have formerly done without it. This is because the speed of the turn will temporarily destroy the throwing control until the two movements have been knitted together.

One day it is well to practise a fast turn with the discus in hand, so that you arrive at the position R2–L3, but without throwing; another day practise a slow turn and a hard throw, interspersing the training with plenty of standing throws and turns with the discus in hand, but without throwing it. You must do this to adjust your body angle to bear the weight of the discus while turning. As soon as a certain degree of dual proficiency has been acquired, commence turning slowly and throwing lightly. Increase the pace as the days go by, until you can practise fast turns and slow throws, or slow turns and hard throws with equal facility. Do this on four days out of the seven, rest one day and upon one other try fast turning and forcible throwing to try out your improving capabilities, but directly there is any falling off in form or distance revert to the slow work. Do plenty of standing throwing, plenty of walking and some distance running to build up strength, and some sprinting to make you

"snappy." You must have a good strong body and strong legs, but in building up these you must not over-develop your muscles, for they must be quickly responsive and the limbs, particularly the shoulders, must be loose in the joints.

Always train under the eyes of an instructor if this is possible, if not then train with a fellow discus thrower and check up on each other's work.

Instructors should look out for the following faults: Right arm bent instead of held straight when above the head in preliminary swing. Right arm not high enough and body too upright at commencement of turn. Body not leaning forward enough during the turn. Arms not moving up and down in waves. Muscles tensed into a tie-up. Upper rim of discus allowed to come away from forearm. Feet out of their positions during turn. (When turning, practice should be done on a cinder circle if possible, the athlete's feet will then write the history of his faults upon the surface for the trainer and himself to read.) Lack of upward body pressure and arm and shoulder follow through. Discus thrown too high. Left leg neither straightened nor stiffened at moment of delivery. Head not dropped back for delivery. Throw unsupported from beneath by the legs, body, and arms. Throwing arm moving forward before the hips are up and the shoulders square to the front.

CHAPTER XIII

SHOT PUTTING

THE Shot Put is an event with which every schoolboy is familiar, and yet the only one schoolboy I have ever seen perform in anything nearly approaching correct form is Dr. R. Salisbury Woods, the Dulwich College record holder and present English National and A.A.A. Open Champion.

The main trouble is that our schoolboys never realize that this event requires much patient practice and no small measure of common sense. It is further unfortunate that the 16-lb. shot, designed only for the use of strong, fully matured men, is in universal use at our schools, whereas boys under fifteen years of age should use only an 8-lb. shot, those between the ages of fifteen and eighteen a 12-lb. shot, and the others the full weight implement after they have got their style and developed their strength. It is impossible for a boy to master the correct technique if he is asked to manipulate a weight which is beyond his strength.

The shot is put from a circle 7 feet in diameter,

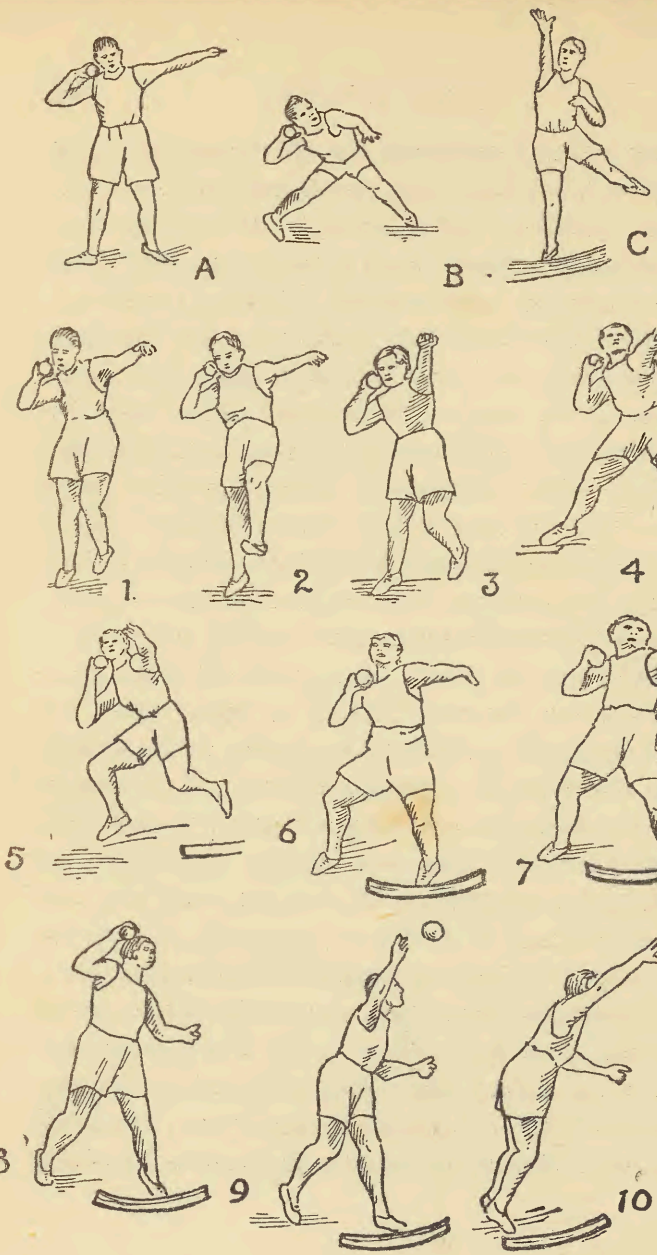
which has on the curve of the front half a stop-board made of wood and measuring 4 feet around the curve. It is 8 inches wide and 4 inches high. Stepping upon the stop-board or allowing any part of the body to touch the ground outside the circle until the shot has struck the earth constitutes a foul. It is also a foul to bring the hand holding the shot behind the shoulder. The put is made with one hand only. Puts are measured from the point of impact to the edge of the circle on a line with the centre.

It is held generally that weight, height, speed, and nervous energy comprise the make-up of the shot putter, and yet some comparatively small men have achieved amazing results. Success is, to a large extent, a matter of patience and constant practice. The actual method of shot putting is easy enough to master. The difficulty lies in dovetailing all the movements in such a way that there may be no diminution in speed from start to finish and no break in the smoothness of the shot putter's rhythm of movement.

The best method of holding the shot is shown in Sketch A. It will be seen that the shot rests upon the lower joints of the fingers, which impart the final impetus just as the shot leaves the hand. It is not every athlete, however, who has fingers and a wrist strong enough to impart this final flick.

These others should rest the shot upon the upper part of the palm, using the fingers only to retain it in position. Never attempt to grip the shot. Sketch 1, A suggests an easy relaxed position which is to be highly recommended. The body weight is pretty evenly carried by both legs. The free arm shows no tension and has, as is right, been kept down to the level of the shoulder plane, while the putting arm is also correctly disposed with the shot tucked well into the neck. Throughout the whole evolution the shot should remain in this position until the final delivery is effected. Sketch B illustrates the position from which the standing shot put, without preliminary glide, should be practised.

Sketches 1 to 10 are of Ville Porhola, the great Finnish shot putter. Nos. 1, 2, and 3 show the well-balanced forward and back swing of the leading leg, which sets the glide in motion. No. 4 carries on the swing to a full leg extension at the fork, with the right knee still slightly flexed for the final drive propulsion of the glide and the left knee well bent so that it may not take the ground forcibly to the left front until the right foot is down. The right foot should pass close to the surface of the ground in the glide shown in No. 5 and should not travel more than thirty inches forward in effecting the glide until it lands at R2, Sketch D. Particular attention should be paid to the manner in which


A
B
C
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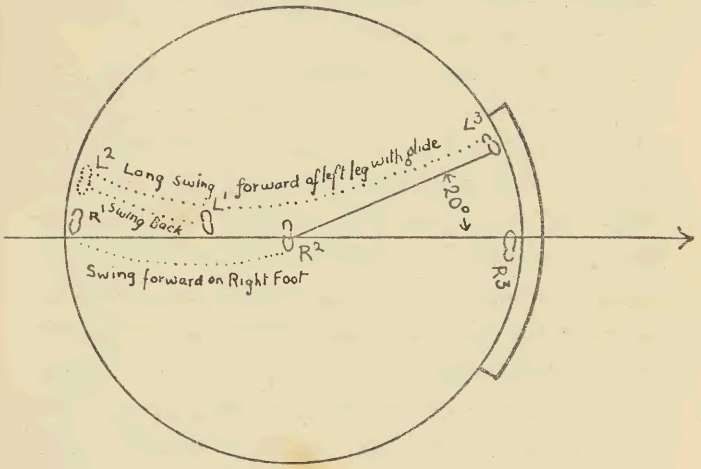
10

Porhola, in Nos. 4 and 5, is drawing his upper body down and back for a long arm drive and full body lift and extension in the final delivery, although both feet are off the ground in Sketch 5. In No. 6 the left foot is grounded ; at L2, Sketch D, both knees



Sketch D

are bent, and the right hip is coming up as the right shoulder comes round, also the head is going back to give the shot elevation when the delivery comes. No. 7 is a most important picture, for it shows how Porhola conserves his energy and retains the correct shot position by forcing back both shoulders and, in much the javelin thrower's manner, is bending the putting arm forcibly back over the shoulder, a

trick which, in both events, has been almost exclusive to the most successful Finns up to the present. There is no doubt that this movement, combined with the full body lift and the pressing up and forward of the shoulder under and after the shot (Sketches 10 and c), tends to give the shot elevation after it has left the hand.

It should be observed that up to No. 7 the shot has been retained in the correct position tucked into the neck, and that these pictures, as well as No. 8, prove how well the expert is able to keep the elbow directly in rear of the shot, so that the drive may have all the power of a direct arm punch behind it. In No. 8 it will also be seen that the shoulders are square to the front and the right hip well up as the hand begins to drive forward in effecting the delivery, and that a strong leg drive is travelling up the whole of the athlete's right side. In No. 9, when the shot has just left the hand, it will be seen that the left leg has taken over the whole weight of the body, that it is straight and well stiffened. This drawing illustrates admirably the axiom that the feet should not be reversed until the shot has left the hand. In No. 10 Porhola is seen effecting, with admirable forward body lean up and under the shot, the reverse, which will draw the right foot through to the front and restore his balance. It can be seen from this illustration how well the legs, arms, and

body have supported the put from beneath. Sketch C shows the completed reverse, a position the athlete will hold until the shot has struck the ground. His right foot is now at R3, Sketch D.

The novice will find that he has a tendency to thrust the shot away from him on a path slightly to the right. This inclination must be checked and the put effected straight out in front of the shoulder. It is equally necessary that the body, arms, and legs should support the delivery and the whole of the body weight go into the put, by pressing the shoulder quickly and forcibly upwards and forwards after the shot (Sketch 10), so that the force from the legs is continued in a straight line upwards and forwards.

Before he can hope to attain proficiency in this event, the novice must be prepared to build up his actual shot put from a standing position, as shown in Sketches B and 6 to C inclusive, and to master the glide across the circle as something entirely separate. (Sketches 1 to 6 inclusive.)

For the standing put the athlete assumes the position shown in Sketch A. He then sinks down with a round and back swing to the position shown in Sketch B. From that attitude he heaves the body up strongly and delivers the shot as shown in Nos. 6 to 10, including the reverse (Sketches 10 and C). Particular care should be taken that the

hand holding the shot is kept close in to the shoulder and that the shot is thrust out and up directly to the front and that the right hand does not break away to the side. Try also to keep the elbow in rear of the shot all the while.

While the outdoor (or indoor if a gymnasium is available and one does not mind the expense of purchasing an indoor shot) standing put practice is in progress, the athlete must be mastering also the glide across the circle. This can be done, even in one's bedroom, if a 7-foot circle is marked out upon the floor. The initial position is as shown in Sketch A, the leg swing as in Nos. 1, 2, and 3. The glide commences with a pendulous swing of the left leg, followed by a 30-inch jump from the right foot as the left leg swings forward to full extension of the thighs, but not of the entire legs, as both knees remain bent. During the jump the right foot must pass close above the surface of the ground, the right foot should take the ground a fraction of a second sooner than the left, otherwise there will be a check when the arm is bent back over the shoulder. The movement of the left, or leading leg, is more rapid than that of the rear leg. The bending of the right knee in the initial position and the sharp swing of the left leg must both be made to contribute to the glide. As has been said, the glide must be made with speed. At first, how-

ever, control is the chief essential, and so speed must be built up gradually. Remember as you land on the right foot at the end of the glide to bend the right knee a little and to draw back the right shoulder.

So soon as both standing put and glide have been mastered separately, begin to knit the two actions together, but be prepared to find at first that you can put as far standing as you can with the glide.

Train five days out of seven, but always for style and only very occasionally for distance, just to see what sort of progress you are making.

At first be content upon one day to practise a fairly fast glide and a very gentle put, another day practise a slow glide and a hard put in combination, on other occasions work lightly and try to make the speed of the glide coincide with the force you get into the delivery. In this way you will learn gradually to synchronize all your movements and so will build up all-round speed, allied to perfect timing. These two things are the secret of success. When you have both phases perfected and co-ordinated, begin to work for speed and strength, but do not neglect the standing puts and separate gliding with the shot in hand to bring you to the foot position R2–L2 *without putting at all,* but having the shot in hand, so that you may adjust your body balance to its weight.

Shot putters should do a good deal of walking and some distance running, especially across country, since that form of exercise helps them to put on weight, to build up strength and stamina. They should, also, do some sprinting and standing high and long jumping to make them nippy. They can, in addition, do body and muscle-building exercises, such as those designed by Monte Saldo in his Maxalding course for strength; and a great deal of it they must have, as well as snap, and I know nothing better to generate both than the Maxalding exercises.

Shot putters need watching, and, failing the services of an expert instructor, should train with another man in their own department of athletics. Training should always take place upon firm ground, and a 7-foot circle properly equipped with a firmly fixed stop-board should always be used.

Faults to watch for are: Stiffness in the initial position and lack of proper knee bend and body twist. Too long a glide or too high a jump in making the glide. Hand holding the shot allowed to come out from its position close to the shoulder, elbow dropping below a point directly in rear of the shot. Simultaneous landing of the feet instead of the proper one-two, right-left landing. Failure to get the hip up and shoulders square to the front before the put is made. Right hand, which holds the shot,

breaking away to the right. Too high or too low delivery. Reverse of the feet during the delivery instead of after it. Failure to support the put with the legs, body, and arms acting under it.

The tendency to try for length rather than style should be checked sternly. A pain in the region of the elbow of the putting arm indicates that one is " throwing " or " drawing " the shot instead of " putting " it ; it means, also, that the hand has been allowed to come out to the side instead of remaining close to the shoulder. This places an undue strain upon the elbow and robs the effort of the power of the direct drive, which can only be got if the hand and elbow retain their correct positions in relation to the shot throughout the effort.

CHAPTER XIV

HAMMER THROWING

DESPITE the fact that comparatively light weights like the late A. E. Flaxman, who weighed just over 11 stone and yet threw 150 feet odd, and the former All America Collegiate record holder, K. W. Shattuck, who reached 160 feet 4 inches, have done marvellously well, the truth remains that big, heavy men, like Pat Ryan, who holds the world's record of 189 feet 6½ inches, and Matt McGrath, the Olympic record holder, are best suited for the difficult job of Hammer Throwing; but still, a man who brings down the beam at anything over 12½ stone has quite a hope of doing himself justice in international competition, especially as the big, muscular heavyweights are often handicapped by the awkwardness characteristic of their size.

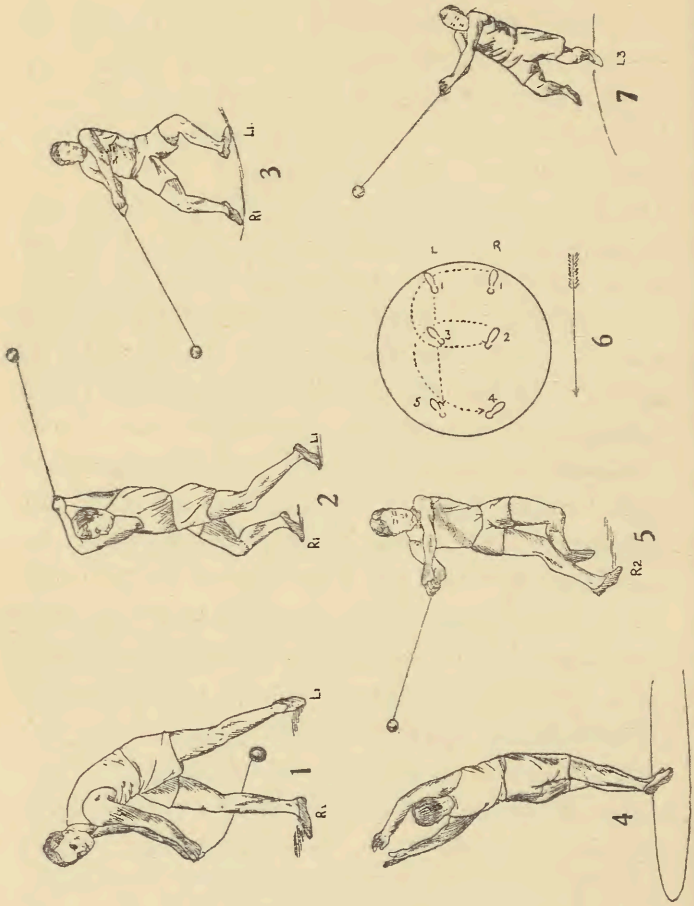
Hammer Throwing is probably the most difficult of all events within the range of athletics at which to attain proficiency. For that reason, if for no other, the number of hammer throwers in any country will always be strictly limited. How difficult it is to master the art may well be

understood when it is stated that when Flanagan was beaten by Plaw, and therefore decided to change from the double turn to the triple turn method of throwing, it took him three whole years before he eventually learned to fully control the throw at the end of the third turn.

Hammer Throwing takes place from within the circumference of a circle 7 feet in diameter, and all throws to count must fall within a 90-degree sector marked upon the ground. The thrower must not step on the edge of the circle nor, with any part of his body, touch the ground outside it until the hammer has struck the ground.

Hammer Throwing can only be learned in three stages. First the preliminary swing, next the standing throw, and, in combination with both, the art of turning.

The athlete takes up his position at the back of the circle with his back facing the direction of the throw (Sketch 1). The feet are planted firmly and sufficiently separated for perfect balance control. This is a matter for personal experimentation. The knees are slightly flexed and the body bent forward and partly to the right. The hammer-head rests on the ground well to the right rear. The thrower's hands, grasping the double handle, or two stirrup handles, as the case may be, are round to the right side and level with the right knee.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L1
R1
L2
R2
L3

The hammer-head is lifted sharply with a strong, steady pull and passes to the front at the full length of the arms. When the hands are level with and in front of the point of the left shoulder the upper part of the left arm is pressed close to the body, the right shoulder is raised and the right arm almost parallel to the ground; the weight of the body being borne by the right leg, and the whole body swaying from the hips to resist the pull of the hammer-head. The hands are raised up and over and well to the back of the head, the shaft of the hammer travelling almost parallel to the ground, while the body leans forward to resist the backward pull. As the hammer-head begins to descend, for the completion of the first preliminary swings, the hands travel round until they are at the right side of the head (Sketch 2). The left upper arm now lies diagonally across the face and then the right arm presses into the body while the trunk is still twisted to the right, just as the weight of the body passes from right to left leg. The arms should again be given their full extension as the hammer comes to the front of the body and the athlete leans back to resist the pull.

Three such preliminary swings usually precede the turn, or the standing throw; but they must not be made too fast, otherwise the hammer will get ahead of the body when the turn is made and

will drag around the thrower instead of remaining under his control.

It should be noted that the hammer reaches its highest elevation just over the right shoulder and its lowest as it passes the right hip, the point at which the turn commences (Sketch 3).

The standing throw is made at the conclusion of the three preliminary swings. The actual heave commences as the hands come down to the level of the right hip for the third time, and is effected by an increased swing of the arms upwards and a straightening up of the whole body and legs so that the thrower rises right up on his toes as he hurls the hammer away over his left shoulder (Sketch 4).

Two or three weeks should be devoted to mastering the standing throw, as early accuracy in this phase will pay for itself over and over again later on.

At the same time that swinging and standing throws are being practised, the athlete may be doing some preliminary turning in slow time without the hammer. He should first learn the single turn. For his present purpose it consists simply of spinning upon the toes of the left foot, placing the right foot down hard without quite completing the full turn, otherwise no ground will be gained, and then, when the right foot is planted firmly, drawing back the left foot quickly to a fresh position parallel to that of the right. From this position the throw

with one turn is executed, but it is not quite so easy as it reads.

Bear in mind that it is the right leg that contributes most of the two to the throw. The left foot is the pivot foot around which the right travels. If in turning the hammer pulls you over to the left, it means that you have made too large a turn. The throw must be made *over* and not from below the level of the shoulder. Momentum both in swinging and turning must be gradually and progressively increased.

One of the first things to learn is the control of the hammer itself ; both in swinging and turning the thrower must always be in advance of the hammer (Sketch 5).

Directly the rudiments of throwing are mastered, work always for speed and yet more speed.

Train with plenty of standing throws ; then with slow turns finishing off in hard throws, and fast turns finishing off with light throws. Then bring in throwing to time in such a way that the speed of the turn and the strength of the delivery about balance each other ; in other words, feel that you are throwing with control. Gradually increase the pace until you can turn your fastest and throw your hardest without any loss of control, while supporting the throw from beneath by the upward stretching of the body to the tip-toe rise and by

pressing your shoulders up and after the hammer, so that the full force of the leg drive comes straight up and through in the line of the hammer flight. Let the arms swing up freely in the follow-through movement (Sketch 4).

The throw as a whole may now be described.

For the sake of the experts-to-be we will assume that three turns are to be used (Sketch 6).

The thrower turns to his rear, back to the direction of the throw, and is at the back of the circle, reckoning from the point at which the throw will be made. The right foot is at the edge of the circle separated from the left by about 24 inches and some 6 inches in advance of the latter. Feet firmly planted, knees slightly bent. The fingers are inserted into the handle-loops and the hammer-head swung back to rest at the right rear (Sketch 1). Preliminary swinging then takes place as already described.

In the last swing increase the pace at which the hammer is travelling, but do not let it get ahead of you. Increase the speed by the use of the arms only, do not lean the body to the side. As the hammer-head moves down and the hands come level with the right hip, rise on the toes (Sketch 3), *bend the right knee in towards the hollow of the left knee,* lift the right foot, and spin around on the left. The right foot takes the ground at R3 and

the left foot is immediately drawn back to L4 (Sketch 6). The original position has now been regained; but there must be no break before one pivots on the left foot and makes the second turn, the third is made in exactly the same way. The knees are kept slightly bent and the hammer-head reaches its highest point during the turning movement (Sketch 7). The second turn is the most difficult, as there is always a chance of getting the hammer swinging too quickly, so that there is no more speed left for the final turn. Each succeeding turn should be faster than the last. The body carriage in the first turn affects the whole of the subsequent turns and is a decisive factor.

The throw is made at the end of the third turn, all the power coming from below upwards, i.e. the moment the arms start their final pull from the hand position by the right hip (Sketch 3), with the most powerful swing they can manage, and with the pull coming from the left side, the whole body is straightened. The arms must be held perfectly straight. At the last instant the body stretch is completed by the athlete rising high on his toes (Sketch 4). The hammer must not be jerked away, but must leave the hands perfectly smoothly at the end of the powerful upward swing, in which the arms have travelled *with* the hammer until the crucial instant of delivery.

The follow through and swing round in sequence should prevent the thrower from fouling by going out of the circle, but do not develop a sort of accentuated pull-back which has the same effect upon the hammer as a stab-shot has on a billiard ball.

Never train for the shot put while you are practising for the hammer throw, and vice versa. The sets of muscles employed in these events, i.e. the pushing and pulling muscles, are directly opposed to each other.

CHAPTER XV

THE LONG JUMP

EXPERIENCE has taught me that although long jumping is practised at all our public schools, and at a great many open sports meetings besides, there still prevails a good deal of haziness regarding the requisites appertaining to and the rules governing this event.

In the first place, the run-up is unlimited in length. The spring is made from a "take-off" board. This "board" must consist of a joist of wood sunk flush with the ground. It is 4 feet in length, 8 inches wide, and 4 inches deep, and it should be painted white. The ground beyond the board must not be trenched, or dug out, as was formerly the case, but should be provided with a 4-inch ridge of sand a quarter of an inch in height, to take an impression and so assist the judges in deciding if a competitor has overstepped the take-off board, thereby committing a foul and nullifying his jump. The landing-pit should be of sand, and not of lumpy earth. The sand may be watered,

so that the feet upon landing make a clear-cut impression.

Each competitor is allowed three jumps, the three leading competitors may be allowed three more jumps ; but if the extra jumps are not to be allowed such fact must be stated in the programme. It is usual to allow the winner a seventh, or exhibition, jump.

If a competitor swerves aside, so that he crosses the take-off line, or line extended, it counts as a try, although he does not actually jump.

Jumps are measured from the first break in the sand made by any part of the jumper's body to the edge of the take-off board nearest the pit.

The employment of weights or grips is forbidden.

World's record in this event is 25 feet 6 inches, and was created at the Paris Olympiad, 1924, by Robert Legendre, U.S.A. The record for the Public Schools Sports Meeting is 21 feet 9½ inches, and was made by V. Powell, Clifton, in 1923.

Famous long jumpers have been of all heights and weights, from the diminutive F. C. Irons, U.S.A., standing 5 feet 5½ inches in height and weighing only 9 stone 7 lb., who won the 1908 Olympic Jump at 24 feet 6½ inches, to the Irish giant, the late W. J. M. Newburn, who stood a lot over 6 feet and weighed round about 14 stone, and

yet was just about the equal of Irons in merit of performance.

The all-important attributes of the long jumper are speed and thigh power. Style can be acquired by practice. It may here be stated that both the famous South African speed runners, R. E. Walker and B. G. D. Rudd, were capable of clearing 22 feet without any particular style, and could have been trained to do a great deal more. Speed, therefore, is the governing factor, and one that almost guarantees distance; but speed must be allied with the ability to hit the take-off board properly, to leave it in correct form and to get the body well up into the air.

If a sprinter fails to make out as a long jumper, it is because either he lacks thigh power or has failed to pay proper attention to the sequence of body movements in mid-air which should succeed the take-off.

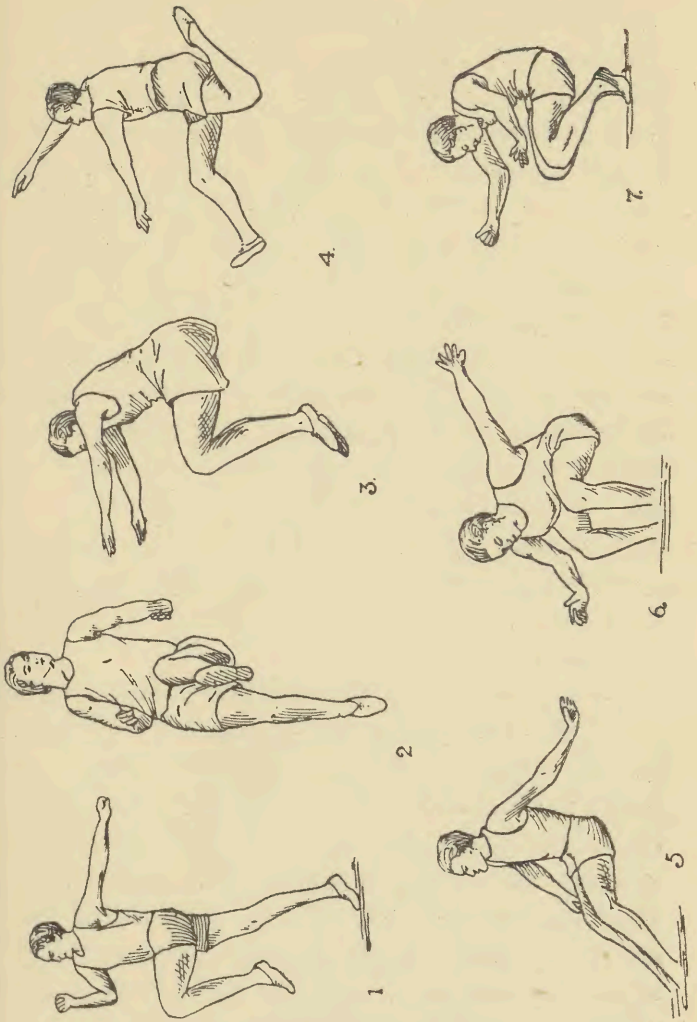
The distance of the run-up to the take-off varies with the build of the athlete and his practical experience of his own peculiar requirements. As a preliminary, most athletes place themselves just back of a 27-yard mark, feet together and shoulders square to the pit, rise on the toes and trot forward, increasing the speed until the foot from which the spring is to be made hits the 27-yard mark, by which time they are travelling at a little short of top speed.

Some few athletes use a sort of crouch start, but it is not recommended.

The athlete travels the initial 10 yards of his run pretty fast, makes the pace as hot as possible over the next 10 yards, and without diminishing his pace lets the legs work loosely over the final 7 yards, as he draws the body together for the jump. Many jumpers shorten, or " chop," the last two or three strides a little, adjusting the speed to the take-off and in order that the leg may be well under the body when the heel is stamped hard down for the spring. Others hold their full speed right through and yet preserve the proper forward body angle of the sprinter (see chapter on Sprinting). These get the full benefit of their increasing speed which goes into the jump effort. If it is found that the forward body angle cannot be retained, but that the jumper has to reach out for the board, then the chopping of the last two or three strides should be resorted to.

Most athletes favour heel as well as sole spikes in their shoes, since the take-off generally commences by stamping the heel of the jumping foot hard down ; but there is a small school which favours a spring from the ball of the foot, and these use sprint shoes without heel spikes.

The heel takes the ground, usually an inch or so in front of the take-off board, into which the spikes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sink as the foot roll goes through from heel to the toes, upon which the athlete rises for the final impetus of the spring. This phase of the jump is admirably illustrated by Sketch 1. The athlete has preserved the proper sprinter's running angle, even to the arm action and knee pick-up, and he has his body well over the leg which has accomplished a powerful downward drive. The swift and powerful throw-up of the leading knee is particularly important, and the arm action should also be noted. The arms have just finished their contribution to the speed run and will next be flung up and forward to help lift the body into the air. It will be noticed that the foot roll from heel to toes has been well carried out, and in consequence there is seen a powerful leg drive from the ball of the foot, with the body well in advance of the leg.

Care must be taken not to exaggerate the approach speed and momentum at the expense of proper take-off form and adequate body rise, such as is shown in Sketch 2. In this picture, which shows admirable balance, it should be noted that the arms and legs are working in concert, and another most important matter, that the leg from which the spring was made has not been drawn up too quickly. From the position shown, the athlete can adopt either of the two recommended forms of the mid-air phase of the jump.

He can draw the right leg up to the left, so that he appears to sit in the air, as shown in Sketch 3, at the top of the high rise, due to the strong forward tendency imparted by the take-off. In this position he will sail through the air until he shoots out the feet for the landing, a trick which will gain him from 9 to 18 inches of distance, if properly carried out as shown in Sketches 5, 6, and 7.

From the position shown in Sketch 2 the athlete has the alternative of another, and perhaps better, mid-air body movement, which is, however, far harder to master. This is what the Americans call the " hitch-kick." It consists of taking a step in mid air (Sketch 4), and at the same time jerking the body upwards. Legendre used this method when he broke world's record, but I noticed on that occasion that he added to the movement a steep backward body lean and a wonderful subsequent whip-up of the trunk from the waist as the kick, or step, was made. Some jumpers commence the kick by working the arms and legs vigorously after the initial leg swing upwards from the take-off, others delay it until they have reached the top of their rise. Sketch 4 shows William Björneman, Sweden, who holds the Scandinavian record of 24 feet 3 inches, just about to commence the hitch-kick.

In either case the ultimate landing is effected in

the same way. As the " sail " jumper (Sketch 3) and the " hitch-kicker " (Sketch 4) begin to descend, the feet are thrust out to take the sand in the position shown in Sketch 5. It here appears that the athlete is bound to spoil his jump by falling backwards into the pit, but Sketch No. 6 shows the manner in which the trunk is forced down over the thighs, part of a forward arm action, and also the distinct " knee-break," which gives the body a further forward momentum. If, however, the athlete were content to abandon his efforts at this stage, he would still spoil his effort by sitting down or be forced to spring backwards to retain his balance. To avoid this, he swings his arms through as shown in Sketch 7, which carries on the body movement to the front, and finally pitches him forward on to his knees and hands.

It is necessary that the long jumper should build up his springing powers, but he must also maintain the flexibility of the jumping muscles ; and, with it all, he must increase his sprinting speed. The abdominal muscles, too, will need developing.

A modification of the Sprinter's training table will be useful to the long jumper ; he should also use Paddock's exercise, in which the athlete lies on his back and works his legs as if he were pedalling a bicycle upside down. " Heel and toe lifting " and " knees bending and stretching " exercises will also

be useful, as will rope skipping and a good deal of well-balanced hopping.

Again, in this event, as in so many others, the work of gaining technique must at first be divided off into watertight compartments.

The athlete must, of course, be able to hold his best speed for a distance of thirty yards or so.

The formation of the run-up is an all-important matter. This is how it is best accomplished. A sprint path of either cinders or firm turf leads up to the take-off board; if it is of cinders so much the better, for then the history of the athlete's foot-work will be written upon the surface. Measure back from the path-edge of the take-off board a distance of 7 yards and make a mark that can be seen easily. Make a second mark 10 yards farther away, that is at 17 yards from the path-edge of the take-off board, and yet another mark 27 yards from the take-off board. Face towards the pit and run briskly, but not too fast, towards the pit. Make sure that the foot from which you spring hits the 27-yard mark and then "cut loose," but have someone standing by to see that your jumping foot hits the 17- and 7-yard marks and finally lands fairly upon the take-off board.

If all this happens—but it probably will not—all is well.

Should, however, the jumping foot not come

down on the 17-yard mark, some adjustment is necessary. This is done by moving back the " 27 " as much as the foot fell short of the " 17 " ; or, alternatively, moving the " 27 " as much forward towards the pit as the foot overstepped the " 17." This fixes the space between the two first marks ; but it may now well happen that the distance between the 7-yard mark and the board will need adjustment. This is done as already described. But it must not be forgotten that the 27–17 bracket is already fixed ; therefore, however much it is necessary to move the 7-yard mark nearer to or away from the board, so, correspondingly, must the " 17 " and " 27 " *both* be moved nearer to or farther away from the take-off board.

Do not forget that it will in all probability be necessary to shift the marks as the training progresses. There are other factors also to be considered. A soft approach path necessitates the shortening of the run. On a hard surface it must be lengthened. If the wind is behind you lengthen the run, if it is blowing in your face shorten the run ; but increase the run more when the wind is at your back than you would shorten it if the wind was in your face.

Practise the run until it is mechanically perfect and you can do without the guidance marks altogether.

At the same time that you are perfecting the run practise also the take-off and the body-lift into the air. This can be done by making the jump at the end of a 15 yards run. In this exercise, concentrate all your thoughts upon achieving height and not distance.

As the style is worked in and the run begins to form, practise the fast run-up culminating in a light jump, then a medium pace approach with a vigorous take-off to lift you high into the air ; add to this the mid-air body movements in due course. After a while try steady running and jumping, combined at such a pace that leaves you perfect body control throughout ; gradually increase the speed of run and force of take-off until you have it pat at full pressure. Concentrate also on the " break " landing already described.

Get the instructor, or games master, or failing them, another long jumper, to help you with your preparation.

The instructor should watch for any of the following faults, and observe the following points :

The run-up must be long enough to allow the jumper to work up to his maximum sprint speed as he approaches the board. It must not be so long that he uses up all his forces in the sprint.

Watch the body angle, as well as the position at the take-off.

See that the jumper straightens out his rear leg and comes right up on the toes in making the spring.

See that he throws the leading knee up swiftly and strongly and that the swing of the arms tends to lift the body into the air.

Watch that the take-off foot is stamped down hard enough and that the forward body angle allows for a perfect leg drive to lift the body to its proper elevation in the air.

Watch the shoot of the legs and the "break" landing.

See that the back leg is drawn up slowly and smoothly from the take-off.

See that the mid-air hitch-kick, if used, is controlled by the arms and well balanced.

Jumping should be practised only on every other day. Moderation is the jumper's watchword. The alternate days may usefully be filled in with sprinting practice.

Remember that your run-up and take-off must both be absolutely accurate. Therefore always measure the run marks with a tape, both for practice and competition.

CHAPTER XVI

THE HOP, STEP, AND JUMP

THE Hop, Step, and Jump is closely allied to the Long Jump, and the reader is therefore asked to study this chapter in conjunction with the last. The rules governing competition provide that the athlete shall first land upon the same foot from which he shall have taken off, the reverse foot shall be used for the second landing, and both feet shall be used for the third landing. In all other respects the Long Jump rules apply. The same may be said as regards the training and preparation.

That it is not necessary to have long legs was proved at the Paris Olympiad, 1924, when Brumelo, an Argentine with very long legs, started off the contest with a new Olympic record of 50 feet $7\frac{3}{4}$ inches, only to be beaten in the last round by the short, sturdy Australian, A. W. Winter, who set up a new world's record of 50 feet $11\frac{1}{4}$ inches. The one thing necessary, apart from the ordinary attributes of the long jumper, is very strong knees, otherwise these will go when the single foot landing on hard turf or even cinders is effected.

The run-up is formed as for the Long Jump.

The secret of success lies largely in one's own ability to co-ordinate the hop, step, and jump, and to give to each its proportionate value in distance. In a jump of from 46 feet to 48 feet, the Hop should cover from 16 feet to 18 feet, the Step 10 feet to 12 feet, and the Jump 18 feet to 20 feet.

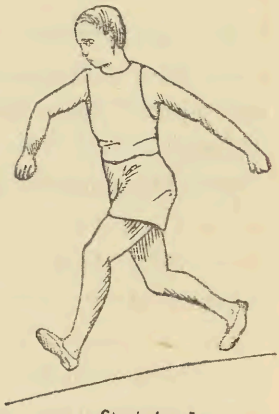
In point of fact, the three phases of the total effort each comprises a jump of varying degrees, the middle phase corresponding most closely to its title.

In each phase the athlete should try to increase his speed and not bother about striving after long leg-stretch. It is the speed which proves the final deciding factor. At each take-off the heel should strike the ground first, so that the athlete comes through on a proper foot roll from heel to toe-tips in making each spring. As this means that he also lands upon the heel, there should be a rubber pad in each shoe-heel, otherwise he is almost certain to develop " stone-bruise."

The middle phase, which is the step, should be given something of its true character. After the take-off has been effected for the step the rear leg should be allowed to trail at full length, and there should be a perceptible drag upon the accompanying side of the body, caused by letting the abdominal muscles relax easily sideways (see Sketch 1). Max-

alding exercises will teach this method of individual muscular relaxation.

The initial take-off for the Hop should be made from the foot one would normally use in the ordinary running long jump, but personal experimentation may prove that it is better to use the other, so that the normal foot is reserved for the final Jump take-off.



Sketch 1.

A good deal of strength must go into the Hop, but the body must not rise so high that the knee will give in the single foot landing.

Make the Step as long as possible (see Sketch 1), keeping the legs well separated and allowing the rear leg and its corresponding side to hang backwards. Bring the forward heel directly on to the ground for the final spring.

Let everything you have left go into the final long jump, aim at elevation, and get into the effort all the features outlined in the preceding chapter for the Long Jump.

Train only twice a week in the actual triple effort, using up the rest of the time as planned for the long jumper. Train on fairly firm turf, in

preference to cinders or hard turf. Train mostly with a half-run when practising the triple effort.

The instructor, or brother athlete, must watch for the same faults and points set out in the last chapter; in addition he must watch the dividing up of the Hop, Step, and Jump into its proper phases and see that the Hop is neither too high nor the Step in too much the nature of a jump. He should pay particular regard to the middle movement with dragging leg and relaxed side, observing that this necessary relaxation does not affect the keeping of the athlete's shoulders square to the front (Sketch 1).

CHAPTER XVII

THE HIGH JUMP

THE High Jump rules provide that the uprights shall be placed at least 12 feet apart and may not be moved except at the end of a round of jumping, and then only by permission of the judges. The judges decide also the height at which jumping is to commence.

All measurements are made perpendicularly from the ground to the upper side of the bar at the point where it is lowest.

Each jumper is allowed three jumps at each height until he forfeits his right to compete further by three successive failures to clear any one height. A competitor may commence jumping at any height he likes, but once having commenced must jump at each succeeding height.

Diving and somersaulting over the bar are not allowed. A fair jump is defined as one in which the head does not go first over the bar and is not lower than the jumper's buttocks in effecting the clearance.

As soon as a competitor makes a spring in order to jump this is counted as a trial jump.

If a competitor passes under the bar without attempting to jump, it is not counted against him as a jump, but three such runs shall be counted as a jump.

The use of weights or grips is forbidden.

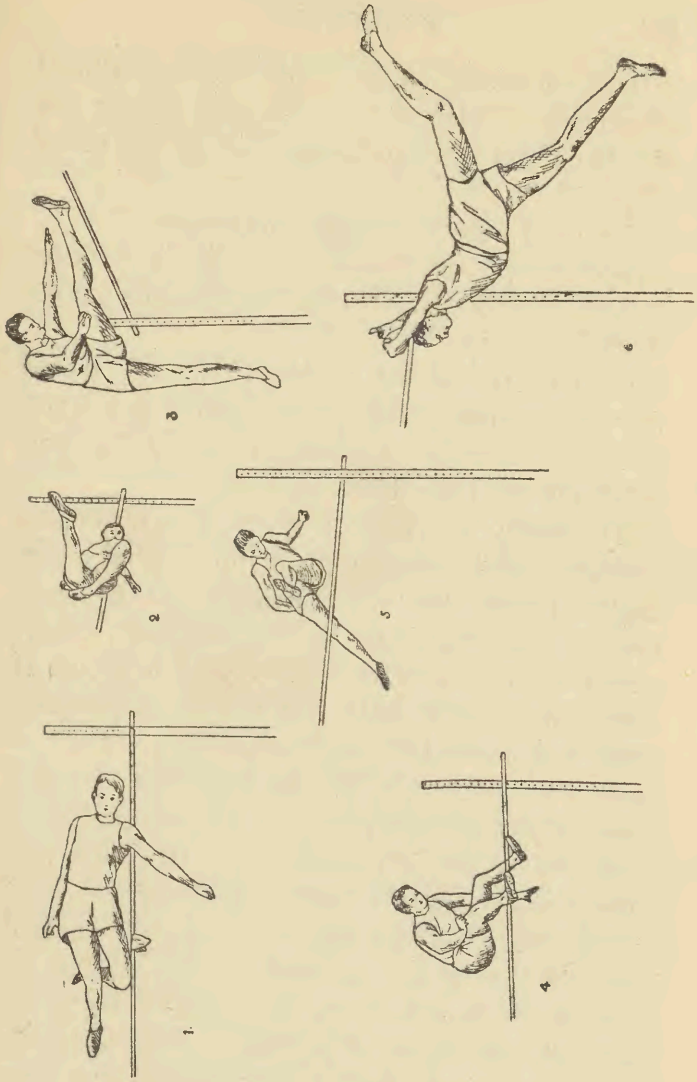
A competitor may (and should) place a mark for his take-off and a handkerchief on the cross-bar for sighting purposes.

The cross-bar should be triangular, $1\frac{3}{16}$ inches side measurement, and painted black and white in alternate bands. A sand-pit should be provided for the jumpers to land in.

It is hardly too much to say that high jumping throughout the world has stood still for a very long time. Jumps that were accomplished five-and-twenty years ago are seldom bettered to-day, except by those athletes who use what is known as the "American Western Roll" style of jumping. This style enabled Horine, Beeson, and Osborn all to beat 6 feet 7 inches, and yet it was hailed with a storm of protest and abuse upon its introduction.

As this style has produced the three best performances on record, it will be described first.

The athlete uses the usual 7- or 10-yard run and takes off on a 37 degrees angle from the line of the cross-bar. Going into the air, the feet are given twice the momentum of the head, so that when the athlete crosses the bar his body lies parallel to it



(Sketch 1). As soon as he reaches this height his under arm is extended so that the triceps rest lightly against the bar, actually holding it in place, the under leg is bent back at the knee at right angles, and the left leg is almost straight out in continuation of the line of the right side of the body, the head is slightly inclined towards the bar. All of these details are shown in Sketch 1. At this point a violent twitch of the body is introduced, forming a semi-revolution with some imaginary point in front as the fulcrum. Sketch 2 shows the athlete extending the right leg for the roll over and about to swing over the right arm also. He will then face directly towards the ground, or rather the sand-pit, in which he will land crouching like a cat.

This style has two great advantages, in that the under arm undoubtedly serves to hold the bar in place, when otherwise a touch of the body might remove it ; and secondly, in this style it is just as hard to clear small heights as great ones. In these circumstances jumpers do not commence jumping until the bar has risen to the point when they dare not let it go any higher, and thus they conserve the energy many another man, less certain of his method, expends in jumping heights he is safe to clear.

It should be rememberd that the take-off impetus dies out just when the jumper is above the bar, and that it is the vigorous extension of the upper

leg, supplemented by arm action, that rolls him over and clear of the cross-bar.

Another style, which is more favoured at present, allows for either the "direct from the front" or the sideways run-up to the take-off.

This style calls for a medium pace approach—since it is height and not length that is desired—of 7 to 10 yards. This is equivalent to ten easy steps or six easy strides. The run-up is springy but not too fast, and the take-off, or foot-stamp, with a roll of the foot from heel to toes, is a fundamental of success. The take-off should be made as near to the bar as possible, and the approximate point may be ascertained by standing in front of the cross-bar and swinging up the free leg, from which you do not jump, allowing sufficient clearance for the up-kicked leg. If the jumper takes off too close, he will kick off the bar with the free leg as it rises; if too far away, he will either have to jump higher than should be necessary to effect clearance, or will knock the bar down with his body before landing.

Sketch 3 may now be studied. As the jumper leaves the ground, the leg is straightened out and is allowed to remain in that position; the body is bent a little forward and the arms and shoulders help to lift the body into the air, but the arms must not at this stage rise above the level of the shoulders. The head is turned so that the body goes up straight.

The free leg now goes over the bar, and the take-off leg is drawn up level with the other (Sketch 4). The balance positions of the arms and hands should be noted.

The leading leg is now stretched out straight and the knee of the take-off leg drawn in to the breast (Sketch 5). This movement comprises a jerk and takes place just when the seat is directly over the bar (Sketch 4). This jerk hitches the seat upwards and outwards away from the bar, but it must be well timed. If the rear leg comes too near the bar, there will be no time to draw the knee up to the breast; also if the free leg is straightened too soon it will hit the bar and the body will not be able to bring about the proper twist.

As the free leg is straightened and the knee of the take-off leg drawn in to the breast, the body twists towards the bar (Sketch 5). The body then turns still more towards the bar, the take-off leg is straightened, the free leg swings up behind the body (Sketch 6), while the arms are carried in one movement forward and upward (Sketch 6), the jumper finally landing upon the leg from which he jumped, and virtually facing the bar he has cleared.

It is important to remember that the free leg should be on its way downward while the take-off leg is on its way upward. It is the impetus of the take-off, or spring, which carries the jumper's seat

up to the level of the bar; it is the leg and arm actions, combined with the twist of the body towards the bar, which get him over it.

The high jumper's training should be designed to exercise the body as a whole, in order that he may have complete control over all his movements. He must not stop short at the development of his legs and thighs, but must build up abdominal strength and also give elasticity to his muscles and speed to his movements by means of gymnastic exercises. It is important also that he should practise kicking high with the free leg, from which the spring is *not* made; and in doing so he must strive to get the legs as widely separated as possible. If one is clever in the mid-air body management, one should be able to jump at least as high as one can reach with a standing kick-up of the free leg.

Under-do rather than over-do the jumping in training. Do not jump for height at all until the style is worked in; and then try yourself out only once, or at the most, twice a week. When jumping for height, raise the bar successively only so long as you find that you can hold the proper form; none the less you should make the regulation three attempts, and, if you cannot then clear it in correct form, although you may do so by sheer spring, lower it and go on working in the right way.

Despite what has been said, one must acquire the

knack of working at good heights, otherwise one can never hope to accomplish them in competition.

Always keep your eye on the cross-bar, that is why you tie a handkerchief on it and why it is painted black and white in alternate bands.

The difficulty of estimating one's own form has been the bugbear of many jumpers. If, therefore, no instructor is available, one should arrange to train with a fellow high jumper, each acting as observer to the other in turn.

Points to watch for are as follows :

Is the run-up free and neither too fast nor too slow ?

Does the jumper stamp his foot down hard enough in making the take-off ? Does he let his take-off leg hang until the free leg is over the bar ? Is the straight-leg kick-up of the free leg strong enough ? Is the forward body position maintained as the athlete rises ? Is the knee drawn into the breast sufficiently strongly and at the right instant when the seat is centralized above the bar ? Is the body twisted sufficiently towards the bar ? Is the jumper putting too much effort into the jump ; more, that is, than is required to clear the height at which the bar is set ? Is the jump made in the same manner upon each occasion ? Do the arms go freely up and forward in one movement when the bar has been crossed ? Is the take-off leg

straightened properly for the second time, i.e. when the bar has been crossed, and does the free leg follow its proper backwards swing as the jumper is descending (Sketch 6) ?

The athlete should himself attend to the following points :

The shoes must fit closely, and be equipped with six spikes in the sole and two in the heel of each shoe. Do not start jumping in competition at too low heights. Keep the body warm by wearing a sweater and the legs by wrapping them in a blanket, except when actually jumping. Rest for several days before a competition. Rest between jumps and pay attention to the leg position. It ruins the elasticity of the muscles to cramp the position of the legs. Get massage before and after competition. Always warm up with two or three easy jumps five minutes before commencing competition. Always strive to effect the landing easily and in a relaxed manner. Never, never land on the opposite foot to that from which the spring was made. If you jump from the right foot, land on the right foot, and vice versa ; you cannot then be guilty of perpetrating the bad and useless old " scissors " jump, so beloved of all uninstructed schoolboys.

Take trouble over getting your run-up and take-off right, even to the extent of measuring it with a tape.

CHAPTER XVIII

THE POLE VAULT

In former days Pole Vaulting was a most popular English pastime. It fell into disuse, however, partly because the athletes found that they had reached the limit of performance with the heavy hickory or ash poles then employed; but, principally, because these same poles were liable to break transversely and impale the vaulter. The element of danger has now, however, been eliminated by the general use of bamboo vaulting-poles, which are also light enough to allow the vaulter to attain to much greater heights.

Only twenty years ago the man who could clear 11 feet with certainty was pretty safe to place well, and in most cases to win, in any competition he cared to enter. To-day all first-class pole vaulters beat 12 feet, the real champions a foot and a half more, and 14 feet has been nearly reached by Charles Hoff, Norway (13 feet $9\frac{3}{4}$ inches), and R. E. Spearow, U.S.A., 13 feet $10\frac{1}{2}$ inches. Many schoolboys have beaten 7 feet 6 inches, and I know one

little chap of 9 years of age who clears his 5 feet 3 inches in excellent style, mainly because he was taught how to vault almost as soon as he could run. The event is competed for at all Championship meetings and has now been included in the Public Schools Sports programme.

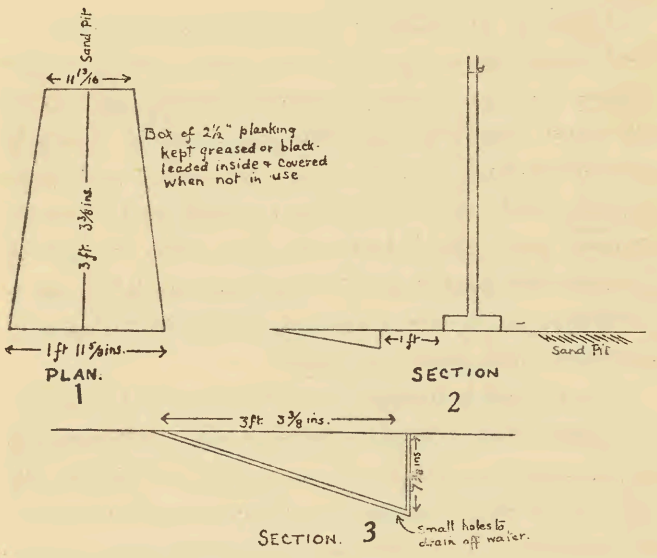
The rules governing competition provide that :

The uprights shall be at least 12 feet apart and may be moved, at the request of a competitor, but not more than 2 feet in any direction ; if they are moved the judges must re-measure the height of the bar. The bar should be triangular in shape, each side measuring $1\frac{3}{16}$ inches. The pegs to support the bar should be round and smooth, $\frac{1}{2}$ inch in diameter, and must not project more than 3 inches from the face of the uprights.

A competitor is allowed to dig a hole for the reception of the point of the pole, but it is better to have a slide-way properly constructed. This should be made of 2-inch planking (see Sketches 1, 2, and 3). Note the narrow end of the slide-way is placed next the sand-pit, so that the pole point enters the wide end.

As soon as a competitor has left the ground for the purpose of making a jump, it is counted as a trial. If he runs without jumping, it is not counted as a jump, but three such runs are reckoned as one trial.

A competitor must not at the moment he takes off, or after he has left the ground, place the lower hand above the upper one, nor move the upper hand higher up on the pole. This does away with the old-fashioned style of climbing.



If the competitor clears the bar but the pole follows through and removes it, it is counted as a failure to clear. No attendant may touch the pole until it has commenced to fall backwards.

Should the pole break while the competitor is jumping, this is not counted as a jump.

Competitors may use their own poles ; these may

be bound with adhesive medical strapping, but may have no further hand support. Private poles may not be used by other competitors, except with the consent of the owner.

In other respects the rules for high jumping are applicable.

There is no branch of athletics in which the technique has so greatly improved during recent years and no branch which demands such great all-round training and complete bodily strength, combined with courage and the ability to think quickly and clearly. Strength, speed, and the most perfect mechanical form are the main factors of success, and any deviation from the accepted style, or failure to fit the movements each smoothly into the next, will spell non-success.

The run-up is formed with three marks in exactly the same manner as has already been described for long jumpers, except that the point at which the foot is stamped down for the take-off must be determined by the athlete for himself, since this is governed by his own height and the height at which he is jumping. The take-off spot may, however, be ascertained approximately by placing the foot from which the spring is made level with the slide-way, or hole, and pacing back an even number of strides to the point from which the approach run is to commence. The take-off foot should then fall

upon the starting mark, and the coach, or a fellow athlete, should stand by the slide-way to see if the jumping foot reaches the take-off mark, and he should also observe the body angle, which should be slightly forward.

The value of the approach run must by no means be under-estimated, for it is an important factor of success. It will need a lot of practice, since it is not easy to run at top speed while carrying the pole. There is a distinct tendency to stiffen the arms and shoulders and to tip up the point of the pole, instead of keeping it parallel to the track with the point directed straight to the front. The athlete has to learn to compensate for the lack of freedom to use the sprinter's style, caused through the pole carriage, and does this by a twist of the rear forearm and hand, and by holding the pole loosely so that it is swung slightly forwards and backwards. This movement, in its turn, allows of shoulder and rear arm swing to approximate moderately closely to sprint arm action.

The athlete must hold a forward body angle during the run, and he must keep his shoulders square to the front so that he does not run in the least bit sideways.

The reason the pole is carried almost parallel to the track, is in order that the thrust of the point into the slide-way may be perfectly smooth.

The run-up should commence at moderate speed and work up to maximum pace in the transition period, when the point of the pole is just about to touch the rear wall of the slide-way and the lower hand glides smoothly up the pole until it touches the upper one.

The approach run should be brought to such a pitch of mechanical perfection by practice that, during the run, the athlete can devote his whole attention to vaulting form.

We must now consider the method of holding the pole.

At low heights the upper hand should take its hold slightly higher upon the pole than the height it is desired to clear; at extreme heights, and when perfection of form has been attained, the upper hand-hold may be from 6 to 18 inches below the height of the bar.

At the start of the run the athlete stands square to the pit, with the point of the pole resting on the track; the upper hand has a palm-upwards grip, the lower hand a knuckles-upwards grip—in other words, the upper hand is under the pole, the lower hand over the pole. The point of the pole is raised until the whole shaft lies parallel to the track, the rear or upper hand is then brought forward until it is level with the right hip, if the right is the upper hand. This can only be done if the upper hand has

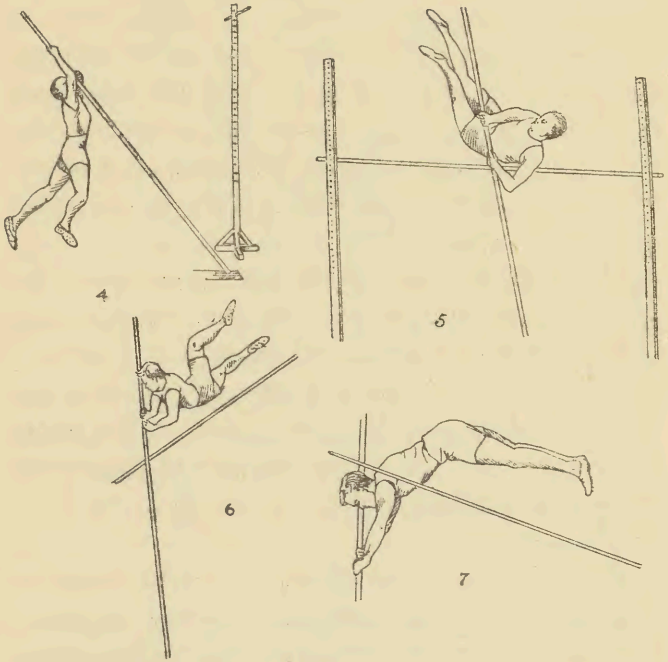
a loose hold. The forearm is across the waist and approximately parallel to the ground, the lower hand holds the pole firmly and supports its weight. The distance between the two hands will be approximately 30 inches.

With the right hand brought level with the hip, a position of considerable strain will be at first experienced, but a loose hand-hold of the rear hand and acquired shoulder looseness will compensate for this. The position is worth cultivating, as it allows of the shoulders being kept square to the front during the approach run.

As the athlete approaches the take-off mark, he jabs the point of the pole into the slide-way precisely and with a good deal of snap and takes a firm grip with the upper hand. He will now see the value of carrying the pole parallel to the track. At the same time he pushes the shaft of the pole in front of his body, holding the arms slightly bent. In this position it will be found comparatively easy to slide the lower hand up the pole until it reaches the upper one. The thrust into the slide-way is made just as the left foot (presupposing the spring to be made from that foot) strikes the take-off mark, and at the same instant the shift up of the lower hand is made.

The vaulter now leaves the ground as shown in Sketch 4. Note that the arms are held slightly bent

at the elbows, a full extension would spoil both the athlete's balance and the subsequent pull-up on the pole. It should also be observed that if the spring is made from the left foot, with a right-hand upper



hold upon the pole, the athlete goes into the air with his *left side next to the pole.* The right leg is thrown stiffly upwards as the left foot stamps down for a vigorous take-off. The left foot quickly passes the right, but is again repassed by the right when the

the cross-bar is directly above the rear wall of the slide-way.

For the guidance of the novice it may be stated that a vault over a bar set at 8 feet high *usually* calls for a take-off mark 7 feet back from a line directly below the bar; as the height increases, the take-off mark is moved farther back from the line under the bar.

In training, the athlete must perfect his approach run, and should learn, first at a walk and then at a run, the quick thrust of the point of the pole into the slide-way, the hand-slide, and the trick of pushing the shaft of the pole out in front of him. He should get this fairly certain before he attempts an actual vault. The first consideration is to attain correct form, when the height will look after itself; even so, do not train in vaulting more than four days a week and only once a week for height; read the training advice given to High Jumpers in this connection. Since speed is so important a factor, sprinting must be practised. The necessity for building up a strong body and strong arms is obvious; therefore utilize the winter months for gymnastic work, such as rope climbing, bar exercises, to make the arms and shoulders as strong as possible. The high jump should also be practised to make the muscles of the legs strong and flexible. Practise some vaults from a standing position, at a walk, and

with a slow run. Practise jumping purely for foot elevation, but without a cross-bar. Use the pole and see how high you can get your feet above your head.

The spiked bamboo pole should only be used when it is necessary to dig a hole for the reception of the point. Poles for use with the proper slide-way should be plugged with rounded-off wood at the point.

The coach or fellow athlete should look out for the following faults :

The athlete does not keep his shoulders square to the pit, lacks foot traction and wobbles in his run ; pole is not carried parallel to the ground and straight to the front, it wavers from side to side during the run. The point is uptilted, and consequently the athlete's body is held too upright. The shoulder, forearm, and hand do not swing sufficiently in the run, and consequently there is no compensation for the lack of the sprinter's proper arm action.

The point of the pole is not thrust forcefully enough into the slide-way ; the hand-slide is not quick enough ; the shaft is not thrust out in front of the body, the foot does not stamp hard enough in effecting the take-off. The arms are fully extended instead of held flexed. There is lack of leading upward leg swing of the free leg, the legs are drawn too quickly in to the body. The foot elevation is

insufficient. There is no scissors kick, the push-away is not contributed to equally by both arms. Legs are not flexed prior to push-away, and therefore cannot assist it. The athlete does not face approach path at push-away and landing. This point should enable the coach to tell whether the balance of the athlete in the air has been correct or otherwise. Sketch 8 shows a perfectly balanced clearance.

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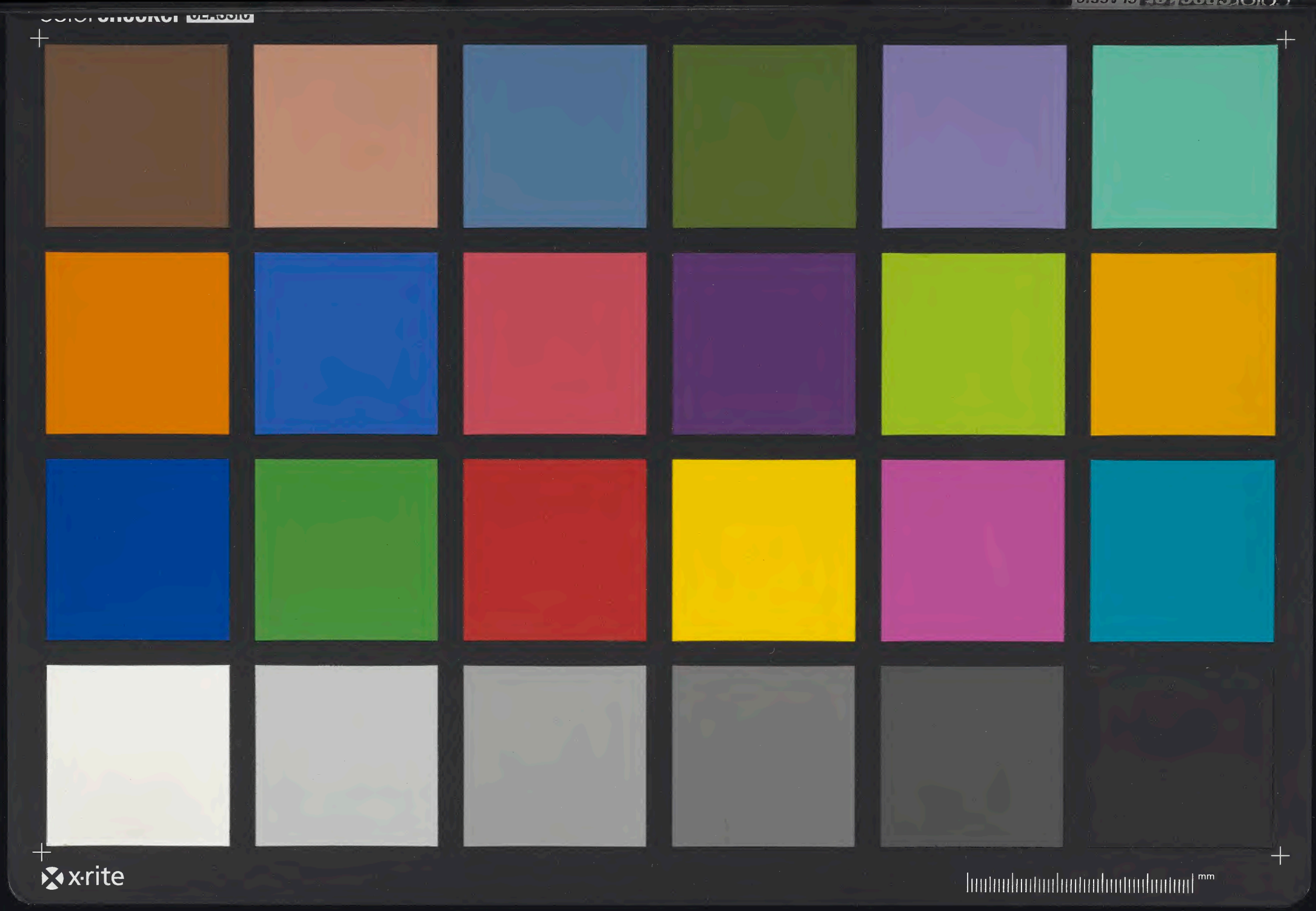
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