RUNNING

Since the assault and victory over the "four-minute-mile" barrier, the runs have enjoyed a surge of popularity in the United States. The challenge and challengers caught the public fancy. Spectators who turned out to watch performances of such runners as Roger Bannister, John Landy, Ron Delaney, Herb Elliott, Jim Bailey, Dyrol Burleson, and Jim Beatty, became fans. They discovered the suspense that builds up during the mile as well as that which mounts from season to season as new candidates step up to challenge the champions. They have added to their enjoyment by learning to recognize, appreciate, and compare the technique and tactics of competitors.

Interest spread from the mile to the half-mile, the two- and the three-mile races. All have much the same suspense appeal, and the same stars frequently run different distances.

Actually, every runner should be able to turn in creditable performances in races just below and just above his preferred distance. Competing in a shorter race sometimes serves to improve a runner's speed; a longer contributes to his endurance; variety helps prevent staleness during the season. A few runners, like Peter Snell, have achieved outstanding success at almost any distance. Snell first won a gold medal for the 800 meters at the 1960 Olympic Games. He later broke Herb Elliott's world record in the mile, established the indoor record for 1,000 yards, and competed successfully in the marathon.

RUNNING

Selecting Runners

As popular interest in the runs has grown, so has the number of American youngsters aspiring to be runners. Those who are really serious, who expect to be creditable members of high school and college track teams or to be counted among the great runners of their time and country, need to realize that dedication and hard work will be as important to their eventual success as their ability to run. Training and competition will separate those who have the essentials from those who haven't. But it should be of interest to individuals and helpful to coaches and teachers to have some standards of comparing the natural endowments of competitors and hopefuls.

It is quite simple to observe that great middle distance runners have usually been medium to just above average in height, slightly below average in weight, slight of build, with well defined musculature. They also usually have a somewhat lower pulse rate than average. But to select runners purely on the basis of these characteristics would probably result in little more success than choosing them by the color of their eyes and hair.

Champions and potential champions must have an abundance of energy and tenacity. They must be willing to stick to workout proceedures that would seem gruelling to theaverage pe rson, to perform them in fair weather and foul. Furthermore, they are eager, not only to defeat opposition, but to push themselves to full capacity on the competitive field.

More easily and accurately measured, however, is thenatural running ability of beginners. Untrained individuals who can cover

RUNNING

Selecting Runners

the 880 in 2:30 show that they have the inherited speed and endurance required in the runs.

Experience in high school and college has proved this to be a reliable indication for almost any age group. It also coroborrates the widely accepted theory that a peak of natural ability and power of recuperation is reached at about age 13, and thereafter declines without regular training.

Here is a simple proceedure for running this test efficiently in a P.E. class or any comparable group. Have the candidates count off by 2's. The #1's then face the #2's for the purpose of identifying themselves in pairs, each member of which will keep track of the other's time while his group runs the half-mile. The instructor starts group #1 and the watch. As leaders approach the finish line, the instructor prepares to call out the time, giving it to the nearest second aseach man crosses the finish: "2:21...22...24...30 ...33...40". Each #2 man observes the time of his counterpart in the #1 group and reports it to the recorder. The #2 group then prepares to run in 5 minutes, or as soon as group #1 has recovered sufficiently to become observers.

RUNNING

1)Training for Runners

It is probably never more true that a person learns by doing than in the case of running. The training of all great runners has consisted largely of running, running, and then more running. In this way runners condition themselves for competition, develop skill and endurance, become thoroughly familiar with the extent and limits of their own abilities and the techniques which are most effective for them.

The long and constant practice, however, need not be dully repetitious. It can be made more interesting as well as more effective by careful planning toward certain objectives and by including specific proceedures which will help attain the objectives and also provide variety.

2)Planning workouts

At the University of Oregon we develop a master plan for each three months' period. The early training during October, November and December consists of conditioning, cross-country, and testing. The pre-track and long distance practice in January, February and March stresses fundamentals and increasing strength. During the competitive season, April, May and June, all effort is directed toward keeping the athletes in top physical and psychological condition.

The volume of work is rather modest at the start of a training period. It builds up as the year progresses, reaches a peak just before the competitive season, and is again somewhat reduced when weekly meets demand maximum strength and attention. At all seasons our schedules generally follow a pattern of one hard day (1 to 2 hours of work), alternating with an easy day (about 30 minutes).

RUNNING

During the early seasons assignments are made to the runners as a group. During the competitive season each individual has a separate workout sheet on which his assignments are blocked out for a week at a time. Samples of these schedules are included as illustrations of our technique for laying out long range training plans and making daily assignments to a good sized squad. (Tables 1-)

2)Training activities

The training activities prescribed on our workout sheets are made up of various exercises and systems that have been used by outstanding runners and advocated by great coaches. These have been studied, tested and modified to suit our requirements during many years, and should likewise be analyzed and adapted by others to suit their material, abilities and facilities.

It is probable, however, that every runner should include in his training generous amounts of running practice in the pleasurable variety offered by the Fartlek system, the discipline of measured time and distance required in Interval work, some special speed training, and regular exercise to increase strength.

3) Fartlek [1]

Swedish runners and their old master, Gosta Holmer, are credited with having developed the system called Fartlek, which has become deservedly popular with most distance men who take their training seriously. It includes practice of all racing essentials, is flexible enough to fit any time or physical resources, and, by its nature, provides interesting variety. We believe it to be so effective that it makes up ~~more than~~ about half the workouts on our schedules.

The basic idea of Fartlek is to get away from the regularity of the

RUNNING

of the track to work out inopen country where the athlete can achieve a feeling of freedom and of running for fun even while he practices techniques more or less spontaneously. Such a workout should be finished with a pleasant feeling of exhilaration, never exhaustion.

On our schedules, Fartlek has two variations. The first is simply steady running at an easy pace to cover a specified distance, course, or length of time. (Appearing on workout sheets as 2A, 2D, and 3)

The second type of Fartlek is varied running to include specific exercises and practice for race situations interspersed with jogging rests to be taken at the discretion of the individual. A typical pattern for this second type of Fartlek might be something like this:

"Stride for 400 or more yards, sprint to capacity, drop to a resting jog until well recovered. While running at normal pace, imagine the need to pass an opponent in a race, break into a quick burst of 6 to 10 steps, return to pace; drop to a jog. During the next period of pace running, imagine an opponent attempting to pass, accelerate just enough to meet the challenge. Start a series of short sprints, 40 to 50 yards each, until another rest is required. Repeat until the course is covered."

Assignments for the varied type of Fartlek are made by the courses to be run. "Laurelwood" and "Country Club" are both golf courses located conveniently to us; therefore 2B and 2C each prescribe a tour around a golf course. If a another number is appended, it means to include some extra. For instance, adjacent to the course we have laid out around Laurelwood, there are three hills, one about 100 yards, another about 200 yards, and the third 440 yards. If the number 2, 3, or 4 is added to 2B, the appropriate hill should be run up and over during the normal

run around the golf course.

Obviously each coach or individual will have to select Fartlek areas according to what is available. Grass surfaces are recommended, but fields, country roads, paths through woods or parks, and beaches are other possiblities. It should hardly need mentioning that permission should be obtained before using a golf course or any privately owned land. Common courtesy prevents running down the middle of fairways, over greens or tees, and observes all such amenities as stopping quietly when any golfer is teeing up or putting.

3) Interval.[2]

Franz Stampfl bases most of his training schedules on distance intervals to be run followed by time intervals for rest. While this system is very efficient and it is probable that a runner could train himself entirely on 440 yard interval work, such training would certainly become monotonous. Interval, however, is excellent for developing speed and endurance, almost indispensible for teaching pace judgment. We, therefore, include a modified system of interval in our training at least once a week.

We vary the distances to be run from 110 yards through 220, 440, 660, and 880. These are to be run at close to race pace. For example, a 4:40 miler should run his quarters at 70 seconds, a 4 minute miler at 60 seconds, and other distances at comparable times.

A runner is taught to pace himself by practicing timed 110's. Many seem to have a natural sense of pace and master this technique

2. Franz Stampfl,

quickly, even in one afternoon. Others take several weeks or a whole season. When an individual advances from practice of 110's to 440's, he is allowed a margin of error of two seconds above or below his designated time. An experienced runner should seldom deviate more than one second in any quarter mile.

It seems simpler and more logical to measure rest intervals in distances to correspond to those run, rather than in time. Therefore, rests of 110, 220, or 440 yards are suggested instead of rests of 1, 2, or 3 minutes as prescribed by Stampfl. When a man runs 440 yrads, his full rest interval will consist of walking, jogging, or trotting the next 440 yards. (His pulse rate should drop considerably during each such rest.)

To make training more severe, rest intervals are shortened periodically. After one week of full rest intervals, the runner will cut his rest to 220 yards after each 440, a half-rest interval. During the third week of training, rest intervals will be reduced to one third the distance run. At the end of each month, if the runner shows sufficient progress, his time objective is decreased. Whenever running time is decreased, the full rest interval is again used and progressively decreased.

The total distance covered in one workout on interval is a minimum of the runner's race distance, a maximum of two and onehalf times this distance.

The method of assigning interval work on the sample schedules should be self-explanatory. #4 through #7 indicate the distance interval to be alternately run and walked. The letter A, B, or C prescribes the time at which the interval should be run. A small number just above tells

RUNNING

the number of repetitions. Thus, 4 5B tells a runner that he is to run 4 times 220 yards at 35 seconds with rests in between in the amount indicated in a separate box under the heading "~~rest~~". "R/" - (rest interval)

"Sets" are sometimes assigned for variety. Here, instead of repeating the same interval, the runner practices a "set" of distances at a prescribed pace. Thus, 8C calls for a 660 to be run at 1:39, a rest, a 440 to be run at 64 seconds, a rest, and a 220 to be run at 28 seconds; the entire exercise to be repeated the number of times indicated in the upper figure in the box.

3) Speed training

It may not be important how fast a runner can cover the 100 yard dash, but it is important how fast he canrun the last 100 yards of his distance race. He must, therefore, have some speed practice. This is arranged for in two places on our training schedules, under the Fartlek program and on special speed training days.

This training may be described as: sprint 55, shag 55. The runner should sprint 55 yards at nearly his maximum speed, then drop almost to a walk for his next 55 yards. The total distance covered at first is about one-quarter mile. As the weeks progress, distance is added until the athlete goes through about 3 miles of this routine.

Windsprints are much the same sort of exercise, practiced on the track, and measured by the length of the straightaway and the turn. Besides speed improvement they are intended to acquaint the runner with the minor differences of sprinting on the straight or the turn.

RUNNING

3) Steeplechase

In the early season training, all runners practice the steeplechase occasionally. At this time it is possible to choose candidates who show natural ability or interest in this event, who will continue to work on steeplechase activities. When any particular part of the course is to be concentrated on during the workout, this is indicated by the letter on the chart. "A" directs that the first 220 yards with two hurdles should be practiced; "B" ~~the entire course~~ a full lap; "C" ~~just getting over the barriers~~ running the water barrier only.

3) Weight lifting.[3]

Because of the general lack of natural exercise in ordinary life today, we frequently find deficiencies in muscular develpment, not only in the legs, but also in the torso and upper extremities. To remedy any such deficiency and to provide the good muscle tone essential to good posture and coordination, every runner should practice some resistance exercise regularly.

We use weight training, not necessarily because it is better than any other, but because we have a well-equipped, conveniently located weight room. If preferred, some system of isometric, dynamic tension, or comparable exercises could be substituted.

The sample exercises illustrated on the accompanying chart (table 1), are designed to develop the whole body, general strength and endurance.

---

[3] An excellent discussion of the principles and practive of weight lifting may be found in "Weight Training for Athletes", by Bob Hoffman, coach of the U. S. Weight lifting team for the Olympic Games. (Ronald Press Co. New York, 1961)

RUNNING

The runner is not interested in developing body mass, so he should exercise with less than maximum effort but frequent repetitions, two or three times a week, in and out of the competitive season.

Insert table 1-1 about here.

Add Sample Workout Sheets about here

Table 2 Master

Table 3 October

Table 4 Hamuary

Table 5 April

RUNNING

1) Technique of Running

Although points at the finish are not awarded on style but on speed: "Who gets there fustest with the mostest", good technique does contribute to speed and endurance. Coaches and athletes should be familiar with the principles of biomechanics and apply them to improve style whenever they will contribute to better performance.

3)Posture

Every runner should pay close attention tohis posture, striving to achieve an upright running position. A line drawn from the ear through the ankle should be nearly perpendicular. The closer the line of the spine is to the perpendicular, the more likely the athlete is to achieve freedom of movement and outstanding performance.

This theory contradicts a widely accepted belief that an angle of body lean contributes to success in running. But it is based on a comprehensive study made by this writer in collaboration with Donald B. Slocum, M. D.[4] All of our tests show that an upright position is ideal for walking, running, or sprinting.

Good posture comes from good muscle tone. Well developed abdomenal, gluteal, and lattisimal muscles help maintain upright posture. Weight lifting or other exercise contributes to such development and is recommended for all runners as explained in the training section of this chapter.

[4] Donald B. Slocum, M. D. and William Bowerman, The Biomechanics of Running in "Proceedings of the Second National Conference on the Medical Aspect of Sports", Nov. 27, 1960, pp 53-58. The AMA, 535 N. Dearborn St., Chicago 10

RUNNING

3) Arm Carry

The arms contribute to rhythm and direction as well as speed of leg action and length of step. Each individual should experiment to discover thearm position and movement most comfortable and beneficial to him.

Theoretically the forearm should be carried high, having a bend at the elbow of 60 to 70 degrees. The tighter the elbow angle, the shorter the stride will be, therefore each runner needs to find an optimum relationship here. The position of the hand above the elbow and a short arc of swing also contribute to better circulation by opposing the centrifugal force that tends to retard circulation.

3) Hip Position. Slocum and Bowerman [5] pointed out the importance of the position of the pelvis to posture and therfore to running. This detail of the theory may be simplified to: "tuck the tail under". Tightening the abdomenal muscles so that the top of pelvis is rotated backward helps achieve the desired upright posture.

3) Legswing

The swing of the leg should be as effortless as practical. The kneelift in front should be moderately high, but there should be no conscious effort to reach. The leg and foot are dropped directly under the body for foot strike. In continuation of the stride there should not be a complete extension of the stride, but rather the lower leg is picked up lightly and quickly with a moderately high lift of the foot as it passes beneath the runner's body and continues for another cycle.

Ibid.

RUNNING

3) Head

Therunner's head should be up as this contributes to good posture and permits his viewing the horizon. If the horizon appears to be bounding, this is an indication of overstriding. (See overstriding in list of common faults.)

3) Footstrike.

The European coaches have said of Americans: "They run like sprinters". This criticism has reference to the fact that many Americans have used the ball to heel type landing. It should be pointed out, though, that some, like JimBailey and Jim Beatty, have achieved considerable success with this technique.

As more American coaches andcompetitiors are studying methods taught by such interntational giants as Gosta Holmer, Franz Stampfl, Arthur Lydiard, and Mihail Igloi, more runners are learning to practice other types of footstrike in order to choose the one that proves most efficient for them.

The heel to ball landing is the one most likely to feel uncomfortable to the inexperienced American. The technique of landing on the heel and rocking forward has been used by Pavo Nurmi, Emil Zatopec, and Americans Bill Dellinger and Jim Grelle, among others.

The flatfoot landing was the style used by John Landy, Vladimir Kutz, Dyrol Burleson, and Keith Forman.

1) Common Faults

Whenever an athlete's rate of improvement or normal level of performance declines, it is helpful to be familiar with the most frequent causes of trouble in order to suggest probable remedies.

RUNNING

3) Overwork

Although it has been frequently said and demonstrated that the limits of human endurance have not been reached, and that "overload" is a sure way of increasing endurance and muscular strength, it is possible for an athlete to suffer from overwork.

A competitor must go into every race with a reserve of physical and psychological energy. Only careful planning to include long-range as well as immediate objectives will permit an athlete to work close to his capacity and still retain his "hunger to run". Study of the section on training and the sample workout sheets should give adequate suggestions as to how this planning can be done.

3) Lack of rest

Every individual has his rest requirements. Anyone who fails to allow himself adequate rest and recovery time will pay on the track, in the class room, or his every day life. Roger Bannister [6] and Jim Grelle (a National Champion who later ran a number of mile races under 4 minutes) have both expressed the strong belief that sufficient rest is equally as important as regular training in achieving maximum performance.

3) Poor body mechanics

The principles of good body mechanics have already been discussed. If, after practice on their positive aspects, a runner still persists in some bad habit that hinders his progress, he probably need to spend some time correcting one of these specific faults.

3) Poor posture.

If the head and shoulders are forward of the perpendicular center

---

Add footnote 6 to page 15.

Roger Bannister, The Four Minute Mile, Dodd, Mead & Co., New York, 1960

of gravity, they must be balanced on the torso by the pelvis. This posture may be maintained at the beginning of a race when the athlete is fresh, but as fatigue sets in, the quadriceps will resist lifting the leg in a manner necessary for speeding up or even maintaining the cadence at the end of the race.

3) Cross-body arm swing.

As unimportant as the forearm may seem, it still weighs about five pounds. If it is carried beyond the perpendicular center of gravity (the body midline), or beyond the elbow inthe counter swing, it is likely to contribute to imbalance. This may be controlled early in the race, but will increasingly disrupt form as fatigue increases.

3) Over striding.

"What a beautiful long stride he has" is a frequently heard but mistaken compliment to a runner. Actually it takes more energy for a long stride. Over-reaching the center of gravity acts like a brake; it results in the settling of the entire body which necessitates lifting again. This is an uneconomical expenditure of energy. The legswing should, rather, be as effortless as possible.

3) Under striding

The too short stride tends to land slightly behind the perpendicular center of gravity. This gives the appearance of "racing the motor". It also creates a position of imbalance and makes for a running cadence that is too rapid in relation to yardage covered.

RUNNING

1) Race Tactics and Strategy

"Plan a campaign and you'll bathe in champagne, don't by gosh, and you won't even wash!"

The final purpose of weeks and months of training is competition. It may be the Olympic Games, a National Championship, or a series of high school or college dual meets. In order to make the most of the speed, strength, and endurance he has developed, a runner needs to know exactly what his capabilities are and plan to use them to his best advantage. He may use superior strength to overpower a faster competitor or greater speed to cross the finish line first even though in the last fraction of a second.

It is generally believed (though sometimes disputed among tacticians) that races of 880 yards or longer should be run at as even a pace as possible. If a runner expends too much energy in the early part of the race, he will fall into "oxygen debt" and be unable to finish in optimum total time. A five-minute miler, therefore, should attempt to run each quarter as close to 75 seconds as his pace judgment will allow. A four-minute miler, by the same token, should try for 60 second quarters. If there is to be any deviation from this even pace, it should be planned at the end rather than the beginning of a race to avoid the danger of oxygen debt.

Magnificent races have been run -- and won -- by tactics other than the even pace advocated. In the 1960 Olympic Games, Herb Elliott surprised the field with a sprint that began some 600 yards from the finish. In the 1956 Olympics, Vladimir Kutz dominatedboth the 5,000 and 10,000 meter runs by his alternating sprint-stride maneuvers which afforded him

such commanding leads that the sprint finishers could not even challenge him.

It is believed, however, that the success of any such "unorthodox" strategy rests upon the basic principle that every runner must know his own capabilities, must train for and use them according to a carefully organized plan.

1) Equipment

The personal equipment of a runner is almost as meager as that of a swimmer. The difference is the shoes. Every runner should, if possible, have three pairs of shoes, one for wearing to and from the track and for road work, another for regular practice, and a third for competition.

A flat, rubber-soled warm up shoe is recommended. A shoemaker can take the soles off a pair of "spikes" that have been worn down and replace them with material about ½ inch thick, between the hardness of sponge and regular sole rubber (called #18 Iron). Our runners have liked such rebuilt shoes better than any they have been able to buy.

For practice a sturdy but comfortable shoe is essential. A fixed four-spike model is a frequent choice.

The four-spike competition shoe must be comfortable and should be of lightest possible construction. Every fraction of an ouce counts. This fact can be demonstrated by comparing a typcial American shoe that weighs 8 ounces with another fixed-spike shoe that weighs 6. The extra 4 ounces in the heavier pair of shoes will amount to the runner's having picked up literally 220 extra pounds in the course of a mile's race. (Four extra ounced picked up with each of approximately 880 strides.) This energy would certainly be more profitably spent in getting ahead

than in being weighted down.

Running trunks and jersey should also be of lightest possible material. Names of emblems may be silk screened instead of sewn on, thereby avoiding useless, weighty "junk". The ~~only necessary stripe across the chest~~ stripe we want is that of the finish line.

Practice clothes may be as inexpensive as are available. "Long John" underwear may be substituted for sweat pants, not only for economy, but because they do not get clammy when wet and can be worn for competition during cold weather.

Stocking caps are good protection against cold, but a sweat shirt with attached hood is probably more practical since the hood cannot be forgotten or lost.

All gear should be kept clean, washed or dry cleaned as frequently as possible.

Some ceremony or chants conducive