

FLEXIBILITY

Stretching, or flexibility training, offers the runner advantages in terms of injury prevention and increased performance. Stretching should be a vital part of any training regime. Yet, if you are to attain these benefits, it is crucial to stretch properly. Improper stretching could result in injury, tenseness, cramping, or premature muscular fatigue.

Range of Motion

Stretching is an act that allows you to increase your range of motion available to a joint, or group of joints. The shape of the bones, cartilage in the joint, and the length of muscles and ligaments that cross the joint determine your range of motion. Traditionally, body flexibility has been the most neglected component of the five health related components of physical fitness (See components of physical fitness in chapter two). The range of movement for a given joint may vary. It may be restricted (so that it will not bend or straighten) and is said to be “tight” or “stiff”. The arthritic hand is a good example of this. The opposite, is a high degree of flexibility which may be referred to as, “loose jointed”, or “hypermobility”, or erroneously, “double jointed”. Each runner has their own particular physical structure, flexibility, age, gender, injury history, and varying tension levels, which make it difficult to set a standard of flexibility for all (Anderson, 1975, 150).

Injury Prevention

“There appears to be a definite relationship between injury and joint flexibility. Repetitive stretching of the collagenous or fascial ligamentous tissues, over a long period of time, permits the athlete to obtain an increased range of motion”, says Dr. Daniel Arnheim. “This increased flexibility (or range of motion) within the joint, prevents the ligaments and other collagenous tissues from being easily strained or torn during athletics. Thus, good flexibility increases the athlete's ability to avoid injury” (Arnheim, 1985, 19).

Every workout causes microscopic tears in the muscles, and when these tiny tears repair themselves, they form scar tissue. This scar tissue cannot be flexed or stretched. Thus, every time you run, your muscles grow increasingly tighter. A tight, inflexible muscle is a precursor to injury. For it cannot take the shocks and jolts of running, or the constant pulling of a long runner's stride. A tight muscle is ready to be injured

(Weisenfeld, 1980, 33). “Conversely, hyperflexibility must be avoided, because loose-jointed athletes are more prone to dislocations and subluxations. Extreme flexibility is indeed of little value and can result in weakness of the joint at certain angles. Flexibility, like strength, is quite specific to the joint and its surroundings complementary tissues. It varies in its natural degree among individuals”, says Dr. Arnheim.

Forms of Stretching and Terminology

Active Stretch - the active force of the contraction of the opposing muscles stretches muscles. For example, when doing a toe-touch, contracting the quadriceps cause a stretch of the hamstrings.

Ballistic Stretch - Muscles are stretched by the force of momentum of a body part that is bounced, swung, or jerked, as in the toe touch with bouncing. It causes minor tears in muscles and therefore should almost always be avoided.

Passive Stretch - A stretch imposed on a muscle by another person or another body part, or something other than the opposing muscle.

Static Stretch - when a muscle is slowly stretched and then held in that stretched position for several seconds.

Proprioceptive Neuromuscular Facilitation (PNF) - A unique stretching technique to increase the contraction or the relaxation of muscles through reflex mechanisms. Continue to read for further information.

Myotatic Stretch Reflex - A reflex, which in response to a sudden, and powerful stretching maneuver, tightens the muscle in attempt to prevent it's being overstretched. Stretching muscle fibers too far by bouncing or overstretching will inactivate this response. A nerve reflex responds by sending a signal to the muscles to contract; thus keeping the muscle from being injured. Therefore, when you stretch too far, or too hard, you tighten the very muscles that you are trying to stretch (Anderson, 1975, 8).

Trigger Point - An especially irritable spot, usually a tight band or “knot” in a muscle or fascia. This often refers pain to another area of the body.

Stretching

The development of flexibility is a slow process in which persistence will pay off. There are correct and incorrect methods of stretching and there are some stretching forms that may result in injury. For the most part, however, stretching is easy to learn and will pay off in many aspects. One of the most common stretching errors is the failure to saturate the muscles with blood prior to stretching. For a runner, the best way to increase the blood flow to the working muscles is to run. Studies show that tendons can be stretched farther when warmed to 104 degrees F. or more. (Corbin & Lindsey, 1988, 102). Failure to saturate a muscle with blood prior to stretching may result in overstretching a muscle, tendon or ligament and causing an injury. Thus, before stretching run a warm up. Run slow and easy from 1/4 to several miles; depending on your existing physical state and the outside air temperature. Many experts have suggested warm up distance from 12-17 minutes. The general rule of thumb is to jog easy until you break a sweat. For more on the warm up process see Chapter Four under, The Warm-up and Cool-down.

Easy Stretches - After breaking a sweat begin your stretching easy. Preferably, begin with what Bob Anderson calls easy stretches. Use the active stretch or static stretch for these beginning easy stretches. Let us pretend we are doing a simple toe touch. To utilize the active stretch, as an easy stretch, you would simply lean forward until you feel mild tension and would then contract your quadriceps for a period of 10-30 seconds. The feeling of tension should subside as you hold the position. If it does not, ease off slightly and find a degree of tension that is comfortable. The easy stretch reduces muscular tightness and readies the muscle for earnest stretches (Anderson, 1975, 12).

Developmental Stretches - The next step is to move into a harder stretch or what stretching guru Bob Anderson calls a "developmental stretch". Imagine you are stretching the back of our hamstrings and calves by doing a simple toe touch. Begin by simply bending forward and either finding mild tension and holding it for 10-30 seconds, or you contract your quadriceps to stretch your calves and hams for 10-30 seconds. This was the easy stretch. As you progress into the developmental stretch, you will find that the active stretch (contracting quads) will not suffice. The static stretch, passive stretch, or PNF may now be used.

An example of how to use a static stretch (the most common form of stretching) simply would be to bend forward and find the point of tension. Hold this position for 10-30 seconds and release. Go down again, this time a bit farther, repeat. Doing this static stretch for a set of three proves effective. You may consider the first time the easy stretch, and the next two developmental stretches. Never, under any circumstance, bounce

(ballistic stretching) for this load initiates the myotatic reflex (stretch reflex) which causes a muscle to tighten in attempt to prevent itself from tearing under the sudden load.

If we wanted to use passive stretching for these same muscles we might ask a training partner to push down on our backs, lightly, to allow you to relax the muscles that you would have had to use to pull down to the stretched position. This passive stretch should be conducted in the same manner as the static stretch, 10-30 seconds three times is perhaps ideal.

PNF Stretching - The last method for the developmental stretch is the one that proves the most valuable for seriously increasing a runner's range of motion and running performance. This is known as the PNF stretch, as mentioned above. It is a unique form of stretching that yields wondrous results. It is, however, controversial, for it activates the myotatic stretch reflex. More on this subject will be discussed later in this chapter.

The Overload Principle and Stretching

To increase the length of a muscle you must stretch it (overload) more than its normal length. The best evidence shows that muscles should be stretched to 10% beyond their normal length to bring about an improvement in flexibility. Exercises that do not cause an overload by stretching beyond normal will not increase flexibility (Corbin & Lindsey, 1988, 100). The static stretch is the most frequently used stretch since it is less apt to cause injury or soreness (Corbin & Lindsey, 1988, 100). The athlete can easily gauge the intensity of load put onto his muscles and can adjust to that load. This is not always true of the passive stretch or the PNF (proprioceptive neuromuscular facilitation) stretch. The static stretch is done slowly, free of bouncing and generally does not activate the myotatic stretch reflex.

Muscles do not stay elongated or stretched forever. Eventually they will creep back to their original position. Recall that running breaks down muscle fiber, which scars in its re-growth. For this reason a daily stretching routine, following a warm-up, is important. Your breathing should be slow and under control. If you are bending forward to do a stretch, exhale as you bend forward and then breathe slowly as you hold the stretch. Do not hold your breath while stretching. If a stretch position inhibits your natural breathing pattern, then you are not relaxed. Just ease up on the stretch so you can relax and breathe (Anderson, 1975, 12).

Performance

A sensible and consistent stretching program may promote increased running performance. This improvement, however, comes in terms of preventing tight muscles from slowing you, rather than being able to run faster. First let us look at how tight muscles may hurt our performance.

Short, bunched, tight muscles are not as powerful as long and flexible muscles. A short muscle will not contract throughout as long a range of motion as will a longer muscle. This will thus result in slower running. Tightness of indirectly involved muscles too may hinder our performance. For example, tight back muscles may inhibit a runner's stride length (Corbin & Lindsey, 1988, 105).

The real advantage of stretching comes in terms of racing performance. During the course of a race your muscles become fatigued, as they do, they shorten. When muscles shorten, their range of motion is decreased, ultimately slowing the runner. Stride length is the main concern here. If a runner has a stride length of seven feet at the beginning of a race, he may grow fatigued later and shorten to perhaps six feet. However if the runner's range of motion is increased to eight feet, when he grows fatigued the stride length may only shorten to ten. Also, the longer a muscle is prestretched the more powerful will be the subsequent contraction. So, for example, ankle flexibility that allows the knee to travel farther forward will also prestretch the calf farther - resulting in a more powerful contraction and longer stride.

Stretching an Injury

Runners should be advised to never stretch a muscular, ligamentous, or tendon injury. Contrary to popular, and erroneous belief, stretching will not help a damaged muscle repair. It may actually worsen matters. When a muscle has been injured, the fibers have either been torn or strained. In order to repair the fibers need to grow back together. Stretching them makes little sense. After the fibers' regrowth, stretching is advisable. There will be scar tissue that contributes to inflexibility and must be stretched. But how long should you wait before stretching? It is advisable to wait a minimum of 48 hours before stretching a minor muscle strain, and longer for serious injuries. When returning to stretching do so lightly. If you feel increased pain in that injury, cease to stretch it. It is not uncommon for runners to continue to stretch an injury all season long, and never allow it time to adequately heal.

Proprioceptive Neuromuscular Facilitation

PNF has been popular for rehabilitation since the 1960's. It consists of dozens of techniques to stimulate muscles to contract more strongly or to relax more fully so that they can be stretched (Corbin & Lindsey, 1988, 102). PNF stretching to be the most beneficial stretching for racing. The drawbacks are: the amount of time required to do them, the need for a partner, and the increased possibility for injury if done improperly. I have taught my team how to do these stretches effectively and safely, and they utilize these stretches daily. It is difficult to accurately describe the techniques of PNF stretching. It is most advisable to be shown them by an experienced coach or runner. I will; however, attempt to describe the process as clearly as possible. I will use an example stretch in parentheses to help detail the description.

1. During the PNF stretch the limb (leg) so the muscle to be stretched (hams) is elongated initially (sit down on the ground lean forward to touch your toes).
2. Next, perform an isometrical contraction by pushing against an immovable object or partner (push back against your partner with your upper body as he holds you). Then relax.
3. Now immediately stretch the muscle (hams) by performing a passive static stretch (have your partner push your back forward until you find serious tension, and hold). Hold this position for 15 to 30 seconds. The tension of this passive static stretch should be sufficient enough to cause the runners face to flush red, sweat, and to cause minor shaking of the muscles.
4. Repeat with the isometric contraction, repeat with the passive static stretch and do this for 3 sets per muscle.

It is recognized that this form of stretching is extreme. It should not be attempted before going through a normal stretching routine of static stretches that begin with easy stretches and progress through developmental stretches. Nor should this form of stretching be attempted by those who are not seriously competing. These stretches are not for health, they are for performance enhancement only.

Since performing PNF stretching I have found remarkable improvements in my runners' flexibility. One of the PNF stretches I do calls for the runner to lie on his back and raise one leg in the air, supported by my shoulder. I have taken runners from an approximate 70 degree angle before mild tenderness to over 110 degrees! For more

specific information on how to perform other PNF stretches read the final paragraphs of the next section.

A Stretching Regime

It is important to develop and utilize a stretching regime that you perform for every workout, in the same order. Doing so will allow you to develop the habit of going from one stretch to the next without thinking about what is next. This helps when race day comes around; we often grow nervous, forgetting what stretches to do. I also recommend developing a stretching regime that begins with the head and works down. This, too, makes it difficult to leave out a stretch. This will also help to ensure that you do all the stretches you need.

There are many fine stretching regimes available. Bob Anderson has his 12 recommended stretches, Jeff Galloway has three, and just about every book on running has their own regime. Any stretching regime should begin with a warm-up jog, and light or "easy" stretches progressing to developmental stretches. After this, the runner may decide to utilize PNF stretches (of which I am recommending 5) if he feels them useful. Jog from one quarter to several miles depending on the environmental conditions and how long it takes you to break a sweat. Find a soft, temperate and dry spot to begin your stretching. Though I make no recommendations as to just what stretches are to be done. I do recommend you start light, work toward the heavy, and do the same regime every time.

5 Recommended PNF Stretches

1. *Ham Strings* - With the stretchee laying on his back support the leg on the partners shoulder. Aim the leg toward the shoulder of the same side, or the opposite, depending on what feels best to the athlete. Keep the leg fairly straight at the knee for a flexible person and allow the knee to bend for an inflexible one.
2. *Quads* - With the stretchee lying on his back bend the knee all the way and point the knee towards either shoulder, and push.
3. *Calves* - With the stretchee lying on his back raise the leg into the air. Grab the keel with the fingers and use the forearm to press down on the back of the shoe stretching the calve. For tight calves only raise the leg say thirty degrees off the ground. For loose stretchers raise the leg almost straight into the air (ninety degrees).
4. *Back of legs* - Have the stretchee sit up and reach for his toes. Tie his shoes together so that he doesn't have the feet flop to the side.

5. *Shoulders* - Have the stretchee sit on his knees and hold his hands together behind his back. Have him bend forward so that gravity attempts to pull the hands over his head. Do be careful not to push this one too hard - you could dislocate a shoulder.

Chapter Ten

PSYCHOLOGICAL TRAINING & RACING WINNING AND LOSING

F or they can conquer who believe they can." - Dryden "And if I should lose, let me stand by the road and cheer as the winners go by" - Berton Bradley. It has really only been in the last decade that athletes have begun to incorporate mental training into their programs. The field of Sport Psychology is a rapidly growing and relatively young science. It emerged in the 1960's and immediately wasted ten years studying athletes personality types in order to predict which ones possessed the characteristics of a champion. The need for graduates of Sport Psychology programs to make a living at it brought the field in the direction of performance enhancement. We had to give the coaches something they could actually use. Studies began to focus on the effects of various techniques to improve an athlete's performance. Visualization has proven to be of great value to athletes in hundreds of studies. This chapter discusses the mind and how we can train it to do what we desire. For we have found that "Daily mental practice prepares the athlete for all possibilities and helps him or her cope positively with the unexpected, rather than being psyched out by it" (Porter & Foster, 1990, 3). Understanding how our mind works, why we excel and why we sometimes fail. Knowing how our subconscious works and how we can program it, understanding pressures and the powers of goals and affirmations. Improving our confidence and sense of self, will all lead to improved running, and more importantly an improved quality of life. The depth of this chapter should be evidence of my conviction to the value of investigating and learning psychological theory as it relates to distance running. We shall begin with the most powerful part of ourselves, the subconscious.

Part 1: The Subconscious Mind

The Power of the Subconscious Mind

"The great pleasure in life is doing what people say you can not do." - Walter Bagehot
Find yourself a paper clip and a piece of thread or string. Find these objects and come back. Take the piece of thread and tie it to the top of the paper clip. Hold the string between your right thumb and forefinger. Rest your elbow on a table top and support it with your left hand. Allow your wrist to hang totally relaxed and make sure that enough

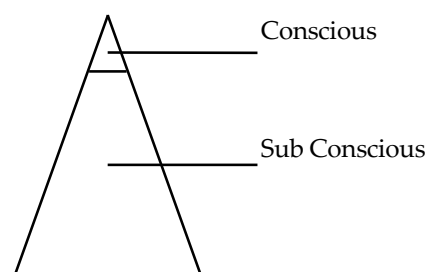
slack is taken up so the paper clip is not touching the desk. You are going to do an exercise that will demonstrate the power of the subconscious mind.

1) Look at that paper clip, and tell it to rock from side to side. Simply say, "Side to side...side to side...side to side." Do not move your wrist, just look at the paper clip and say "side to side...side to side...side to side."

2) Next tell it to swing in circles, say "circle... circle... circle." Say this aloud, tell the paper clip what to do. Want it to stop? Say "stop...stop...stop..." How about front to back? "Front to back...front to back...front to back." Amazing!

OK so how does this work? Is it supernatural? No. It is simply the power of your subconscious mind overriding your conscious mind. Consciously you are not moving your wrist. Subconsciously, however, you are telling the paper clip to move from side to side. The subconscious mind, knowing what it takes to move that clip in the desired direction, essentially overrides the conscious mind and makes tiny muscle contractions, just enough to get the paper clip swinging without your conscious approval; later in this chapter you will come to know this as the Psychoneuromuscular theory

Why is this subconscious mind so powerful? It has to be to carry on the day to day things that we cannot consciously do. Examples of this are that as you read you are recognizing these shapes as letters, and putting these individual letters together to make sounds, which conger up images and emotions in your mind. Simultaneously, you are also hearing the sounds of your environment, and choosing to let most of those sounds filter out of your mind since they pose no reason to be alarmed. Should a dog bark, or a phone ring your subconscious mind might let you know of this "different" sound and shuffle it over to your conscious. Still, you are recognizing colors of the pages you read and the views, shapes, and colors of the things your peripheral vision sees. Not to mention the fact that your subconscious may also be pulling out memories for you as these words spark them. On top of all that, you are breathing, your pupils are constricting and dilating, your heart pumping, and your diaphragm diaphragming.



Your conscious mind is quite small compared to that of your subconscious mind. It is similar to the tip of the iceberg sticking out of the water. Some suggest that the subconscious mind is so powerful it occupies 85-90% of your mind (Moore, 1989). This leaves only 10-15% for conscious thoughts. This limited conscious capacity means that we can only consciously think of one thing at a time. To demonstrate this try an experiment: Have two individuals/friends say two different phrases into each of your ears simultaneously and see if you can decipher correctly what each individual said. You can't do it. Or try to tie your shoe in a different manner than normal while simultaneously solving a math problem. It can't be done. You can work on one, and then the other, but not both together.

Humans have always used something to compare our minds to. In the past we compared it to a clock - today the analogy is the computer. Our subconscious mind is like a computer in that it is programmed. It has been programmed since birth (possibly before) and will continue to store information throughout its life. The nature of the programming ultimately defines who you are. Perhaps you have heard a favorite saying of mine? "Watch your thoughts for they become words... Watch your words for they become actions... Watch your actions for they become you..." This is programming. We are programmed for everything from knowledge to motor behaviors. The nature of some of these programs will help determine the potential success of your running endeavors.

Let us look at a simple motor program as an example of programming. Perhaps you have heard of muscle memory? Though muscles really have no memory, the neurological pattern that is established through a motor task is "memorized" by the motor cortex area of the brain. The more times we perform a given movement the less conscious thought we have to put into it to perform it. You have been tying your shoes for years and you likely no longer have to think about how it is that you are doing it when you do. The same holds true for running. To the point in which we can perform a motor task without conscious thought we call it a habit. The expert tennis player serves the ball habitually - no conscious thought is required. Now, similar to the motor program psychological programming too impacts our habits. The more times you program yourself with the affirmation, "I am a great runner" the more your belief in this statement will come true. The more you believe you are a great runner, the more you will run like one. Humans are truly creatures of habits; we think, feel, act and perceive habitually. Ever known someone who was chronically negative? They learned to perceive events and judge them as being negative - they learned to look for the negative in every perception. Of the countless habits that affect the distance runner are: 1) workout habits; 2) warm up habits; 3) dietary habits; and 4) stretching habits. But perhaps the most important habits we have as distance runners is in the manner in which we talk to ourselves. Some runners input negative messages, and some positive. This chapter will investigate this topic. By

learning affective habits as runners we can learn to do some things naturally in a race, without thinking about them, and profit from those habits. For example, we can habitually, and neurologically learn correct form. When race time comes around it is one less thing you have to concentrate on. We can learn to automatically pick up four quick steps as we roll off the far corner on the track, or round a corner in a road race, and reap those advantages without even knowing we did it. Fortunately, there are ways of programming our subconscious mind. This allows us to develop habits and beliefs that benefit us. *“Excellence is not an act, but a habit”* - Aristotle. Brilliance too is habit.

Programming Your Subconscious Mind

In psychological terms programming the mind is similar to the process of learning. The first to systematically study learning and memory came from an unknown psychologist working alone for years in isolation. Hermann Ebbinghaus's studies in the 1870's found that learning was influenced by several variables. Today we commonly recognize these variables as the importance of the input, the repetition of the input, the association of the input with already learned input, and finally the use of the input. As a child the majority of your life is centered around your parents; thus the majority of your input comes from them. As your providers you take stock in what they say. Thus your parents are your first major programmers of your subconscious mind. When you reach school age your teachers share this programming. We believe, and are taught to believe, everything our parents and teachers say. We even take on similar interests and values. Then as adolescents we begin to allow ourselves to be programmed by peers. We want to dress the trendy style, or act a certain way, hang out with a certain crowd, talk the lingo, and of course we value what our peers say and laugh at the input of adults. As an adult though, who programs you?

Think about it for a minute. No it is not our parents, not society, not our friends, church, neighbors, or perhaps professors. It is us. We as adults are the main programmers of ourselves. As adults we have existing programs that are always under change and we are creating new ones all the time. The more we use a program the stronger it gets. Thus old people may be closed minded to change. Yes we can change the programming of our subconscious mind; we can unlearn and then relearn. We can thus learn to control our subconscious mind, and in the process control the way it controls us. Let me give you a fun example of programming. The following is a Gestaltian concept. What do you see of the illustration below? Do you see an Indian Chief? An arrow? A top-hat? What? Tell me this, do you see a fly? Stare at it until you do. It may take time.



If you still have not found it. Take a piece of paper and put the edge of it just along the bottom of those four little pictures. See it yet? No? Then take another piece of paper and put it along the top edge of those letters. See it yet? No. OK Now look for not a picture of a fly, but the word fly. See it? If not, read it as white on black, not black on white. Now you see. We have been programmed for years to read black on white, now you have been programmed to read white on black as well. Congratulations, you just programmed yourself.

There's even a more powerful way of programming your own subconscious mind. In fact, the most powerful way is also the easiest. It is known as a simple process called self-talk. Self talk, is simply how we talk to ourselves. How you talk to yourself and what you say to yourself is the most effective way of programming your subconscious. Therefore, when you say to yourself, "I'm going to lose" chances are you will. Why? Because we lock onto it. Sayings, like, "I'm stupid...I can't...I'm going to lose" inhibit the possibility of success. The more we repeat these negative sayings the stronger that program becomes. It is also important to recognize that your subconscious doesn't have a sense of humor. It doesn't know you are kidding when you talk negatively to yourself (Porter & Foster, 1990, 14). Fortunately we can also program positive, productive, things into our subconscious.

We are constantly bombarded with programming from outside sources. None are as strong as our own self talk, but over time they can make a significant impact on our programming. What people say to us may influence us, but only if we choose to let it. A Psychologist friend of mine says, "Did you buy the ticket" referring to "Did you accept what they had to say as true?" If not, then it will not serve to program you. If yes, it will. Choose what you want to hear. Allow these positive messages, the good things people say to you to be true. If someone tells you that you ran a good race, say "thank you, I am happy with it too." Opposed to saying, "No, it wasn't that good." Disregard, the bad, the people who try to put you down. The following is a great exercise for those of you that need to learn to quit listening to certain people who are negative to you.

Write down the names of at least five people that you listen to the most. Evaluate each person. What are they saying to you? What percent of the time is it positive? Now I want you to write a short contract to yourself. Decide, who the people are that you should listen to and write, "I will listen to..." Write on another piece of paper all the people who are putting you down or belittling you. Once you have their names down crumble it up and throw it away. You are no longer going to accept what those people have to say - rather you disbelieve what they say. Sometimes it is necessary to listen to people, but you don't have to accept as truth their put-downs or views. Hold the phone away from the ear - don't buy the ticket! I'm not saying to put your fingers in your ears, simply pretend to acknowledge them, and say to yourself. Boy, is he wrong. *"Keep away from people who try to belittle your ambitions. Small people always do that, but the really great make you feel that you, too, can become great"* - Mark Twain. For, *"No one can make you feel inferior without your consent"* - Jacklyn Kennedy.

Affirmations

You now understand that the subconscious mind is the controller of the way we think, act, and perform. You know that the most effective way to program your subconscious is through your own self-talk. The things you say to yourself has the greatest impact on the programming of your subconscious. Your subconscious ultimately controls your thoughts. Thoughts about how you will do in a race and how you ought to do have a profound impact on performance. They can set you up for success or set you up for failure (Elliot, 1984, 118).

Enter affirmations. What is an affirmation? Positive self-talk. Positive, present, self-talk. The affirmation should be positive in two senses of the word. The first is obvious. The first manner in which an affirmation should be positive is that it should have something desirable to say. Obviously, we don't want to develop an affirmation that says, "I'm a lousy runner." Secondly, the affirmation should give some direction, some concept of what is desired. It would be futile to make an affirmation that said, "I'm not going to go out too fast." This affirmation would be ineffective since the mind only deals in positives and might actually result in doing just that - going out fast.

I want you to picture in your head a dog not chasing a cat. OK what did you see? Whatever you saw, you didn't see a dog not chasing a cat. Perhaps you saw a dog and a cat sitting. Perhaps you saw a dog playing the cello. What you saw was a positive image of something, for the mind only works in positives. No wonder kids don't remember when their parents say, "Don't play in the house." The parents need to say is, "Play in the park." Using our computer analogy again I ask you what would happen if you wrote a sterling report on gluconeogenesis as it relates to submaximal running velocity while in a

state of oxygen deprivation and you typed into the computer "don't erase this"? What would happen? The computer would in some fashion tell you to get a life and learn the proper commands. You would then type in something along the lines of "save" and the computer would do such. You see the computer too only works in positives. If you want to accomplish something tell your subconscious exactly what that is.

When we tell ourselves "don't" we fail to retain it. If I say to myself, "I am not going to go out too fast" I have left no direction as to what to do, thus anything could happen. What needs to be said is "I'll go out in 5:10". This gives direction. Let me give a non-running example. Children who were beaten by their parents often grow older to say "I'm not going to hit my kids". They legitimately do not wish to hit their kids. However, their statement of "I am not.." fails to reprogram their subconscious mind of - when problem with kid strike. What they need to say is, "When my kid acts up I am going to....". Now you are reprogramming the subconscious. Here is an example of a common dialogue between me and one of my runners.

Coach: "What is your race plan for Saturday?"

Runner: "Well I'm not going to go out too fast..."

Coach: "Great, what are you going to do?"

Runner: "I'm going out in 5:20."

Coach: "Good."

In addition to being positive, an affirmation should be present. The concept of an affirmation is to program your mind toward success in whatever your affirmation shows you desire. If I desired to be a 4:15 miler, I would profit from developing an affirmation that programs my subconscious into believing that I am currently a 4:15 miler. Once I believe I am a 4:15 miler I accomplish two things: 1) I break down mental barriers that might prevent me from psychologically running this pace; and 2) If I believe I am a 4:15 miler than I start to act like a 4:15 miler, and I help myself become such. Thus the affirmation might read something like this. "I am a 4:15 miler." If a runner's goal is to win his league he might say, "I am the fastest runner in the league." This certainly is not to say that future tense affirmations do not work; they do, just not as well. Remember that some of the best affirmations for you might be the biggest bold-faced lies when you first begin using them. It is important that you say them as if they are already true; the more you say them, the more they will be true (Porter & Foster, 1990, 17). *"They are able because they think they are able"* - Virgil.

Affirmations are simple. Just decide what you desire and create your own affirmation. Make sure it is positive and present, and I recommend that they be kept short, memorable, and usually begin with an "I". It also proves advantageous if an

affirmation rhymes. "Loose and relaxed I run my max" - "I am the greatest" - "I am the best runner in the league." "I always perform well under pressure." - "What my mind can conceive and believe I can achieve." - "I love hills" - "Coach believes in me, I believe in me" - "I run smoothly, and I am powerful" - "I am in control of the race" - "I am a master of the mile (marathon whatever)." - "If it is to be it is up to me." - "I am a doer." - "Hills are my friend." - "I soar the up hills and fly the down." - "I'm a stud."

So just how can you use affirmations to help you? Ideally you not only use them to achieve your goals, but you can utilize them to help you with your weaknesses. For example, if you have a difficult time with the hills half way through your race, you can develop an affirmation(s) to help you with them. "I utilize hills to my advantage" - "I am the greatest hill runner in the race" - "I bound up death hill with ease" - "I love hills" - "Hills are my friend" - "Hills are the strongest part of my race" - "I bound hills with ease"

Once you develop an affirmation it is beneficial to repeatedly say it aloud to yourself. The little caboose had it right when he said, "I think I can, I think I can." In fact, he would have been better to say, "I can" or "I am". Either way, what the little caboose knew before us was that the more we repeat an affirmation, or any message for that matter, the more we will store it, believe it, and be it. The advertisers know this. This is why they repeat a message over and over again. Repeating an idea six times will change 63% of people's minds. 17 times will change 98% of the people (Moore, 1989). Now wonder we have cola wars. We can utilize these facts by repeating our affirmations over and over. I strongly encourage writing your affirmations down and post them in a place where you will continually read them. Perhaps on your bathroom mirror or refrigerator door or say them to yourself in the mirror aloud, daily, and they will become true. I encourage all runners to develop an affirmation that they can utilize during a race. I have even been known to say my affirmations aloud while racing; in fact once in a marathon I continued to exclaim (not too loudly) "I'm a stud, I'm a stud!" All affirmations, both positive and negative, become self-fulfilling prophecies (Porter & Foster, 1990, 14). *"Men are disturbed not by things, but by the views which they take of them" - Roman Epictetus.*

Self-Fulfilling Prophecy

"Hey Jeremy that was a great race, I'm sure you will do well in league finals". "No coach, those guys are too fast for me". "I am not that good." What do we have here? Sure, a negative affirmation that is serving to program Jeremy's subconscious. First Jeremy told himself that he was no good, and then he told himself that he is going to do poorly in league. "What do you want to run today Lisa?" "I'm just trying not to die". She will die.

A self-fulfilling prophecy is closely related to both affirmations and self-talk. It is when something becomes true because it is expected, or because it is believed. It can work either positively or negatively. If a parent says, "You are irresponsible" the kid will become irresponsible. He simply met the expectations of his parents. If a coach says "you're not very fast" you may never become fast. If you bought the ticket! Fortunately, through the use of affirmations we can make self-fulfilling prophecies work toward our advantage. Accepting the positive things people say to you. Or creating your own affirmations and believing them will serve to program your subconscious.

It's no surprise that negative things said to you are often done out of jealousy, fear, or in attempt to make oneself feel better at your expense. By not accepting what they say you can not only avoid becoming that but can "face" them in the same time. For example if someone says to you, "That was a great race Tony but you'll never break 15:00." Simply reply, "Perhaps you ought to spend more time telling yourself what you should be doing and less telling me what I am doing." Or I heard a great one once from a friend. Someone didn't believe that his kid had run the time he had. This guy went on about how the course had to have been short, or the course was cut. The father looked to him and said, "Of course there is always the outside chance that he is a good runner too." Lastly, it does no good and indeed much harm, to say negative things in attempt to be modest. It is OK to compliment yourself and to accept praise. *"If you thought you could you were probably correct, If you thought you couldn't you were probably correct then too."*

Goal Setting

During the final, painful miles of a marathon the pain becomes intense, your muscles cry in agony, your head rationalizing thousands of reasons to stop or quit. What then keeps you going? Your goals. The objective of this section is to teach the reader the basic principles behind goal'ing' and 'de'goal'ing'. Goals add fuel to the fire of motivation, and give you reason to tolerate the pain. Technically there exists a distinction between goals and objectives. A goal is really an immeasurable desire while an objective is measurable. An objective might be to win a race, a goal might be to have the best race of your life. I, however, will use the terms interchangeably.

I recommend that you set and write goals for a variety of aspects. Set them for individual races, seasons, and life. For every basic concept of a goal that you create, it is advisable to set three goals: we call this a realistic, challenging and dream goal. For example, if your current two mile personal record is 10:30 and you want to considerably improve that for the next season, I recommend you set a realistic, challenging and dream goal. The realistic goal is one that you should be one that you know is possible to achieve

since you have either already done it or came very close to it; for this case say 10:20. The challenging goal is one that you know with considerable work, and some luck, you can obtain. For our two miler this may be 10:10. Finally, you have your dream goal, go for it on this one. Our two miler may choose 9:55.

The purpose of setting three goals is to optimize your chances for success. If our 10:30 two miler had only set one goal of 9:55 and fell short running 10:03 he might be disappointed because he missed his goal. However, by creating three goals he has met two out of three and is successful. Furthermore, setting three goals helps you to obtain that ultimate goal by breaking the task down into smaller steps along the way. There is also great pride in watching those first goals met.

Once you have developed your goals, post them in a place where you can see them. preferably alongside your affirmations. Believe in yourself, but set goals that are within reason. It is far better to set goals that are too low than too high, for you can always meet them and then set new ones. Believe in them! *"It must be born in mind that the tragedy of life doesn't lie in not reaching your goal. The tragedy lies in having no goal to reach."* - Benjamin E. Mays

Goal 1:	Acceptable goal
Goal 2:	Challenging goal
Goal 3:	Dream goal.

Part 2: Mental Training

Mental Imagery

This section reviews selected theoretical and empirical literature related to mental imagery and its relationship to sport performance and behavior. It is an excerpt from my Master's Thesis; thus you will find this section written in academic tones. It is thorough in its investigation of the theories and practices of mental training. Such knowledge will help you craft a mental training program that suits your purposes. Additionally, you will find many tactics that you can use as training and racing situations dictate.

Imagery Defined

When imagery has been used or researched in the field of sport psychology, it has usually been defined in the sense of mental practice. The terms mental imagery and mental practice are sometimes, but not always, interchangeable. The two conditions are

not entirely similar. Several definitions of the term imagery have been advanced. The one to be utilized for this review has been offered by Richardson. According to Richardson (1969), "Mental imagery refers to all those quasi-sensory and quasi-perceptual experiences of which we are self-consciously aware and which exists for us in the absence of those stimulus conditions that are known to produce their genuine sensory or perceptual counterparts.

This definition addresses the three criteria proposed by Murphy & Jowdy (1992). First, imagery mimics sensory or perceptual experiences. The individual sees the movement and feels the movements associated with the image. Second, the individual is consciously aware of the experience, and controls it to mimic what is desired. Third, imagery takes place without known stimulus antecedents. In other words, no track need be present for the runner to imagine running on one. Any experience that satisfies these three conditions can be called imagery.

The next concern is that of differentiating mental imagery from mental practice. Whereas mental imagery requires quasi-sensory and quasi-perceptual experiences, mental practice need not. Mental practice is a descriptive term for a variety of techniques. Since there are many mental techniques available, the term mental practice has become an umbrella term for a variety of mental training skills. Some of these skills may include visual images, and some may not. Oxendine defines mental practice as "the introspective or covert rehearsal that takes place within the individual" (1984, p. 280). This definition suits the purposes of not only mental imagery, but other processes as well. The practicing of techniques such as concentration exercises, affirmation development and repetition, relaxation exercises, and even hypnosis may all meet Oxendine's definition for mental practice but not satisfy the criteria for mental imagery.

Further clarification is offered by Suinn (1983) who points out that mentally practicing a tennis serve could involve several different techniques. Thinking about serving, talking about serving, talking yourself through the steps in a serve, imagining another serving, viewing a tape of someone serving, or visualizing a perfect serve you once hit, are all mental forms of practice; they are not all imagery, however. For the sake of clarity, therefore, it should not be assumed that asking a subject to practice mentally implies that they will engage in imagery.

Another popular term to describe mental imagery is that of visualization. This term is often used interchangeably with mental imagery. There have been many terms used to describe imagery; a list here comes from Murphy and Jowdy (1992): symbolic rehearsal, modeling, covert practice, cognitive rehearsal, imaginable practice, dreams,

hallucinations, hypnosis, visuomotor training, introspective rehearsal, implicit practice, ideomotor training, and even sofa training.

Recently another type of research design has become popular as a means of investigating the effects of imagery and other cognitive interventions on motor performance. This design looks at the effects of engaging in mental preparation immediately prior to an event, and compares performance under this condition with performance under practice conditions. Such mental preparation has been referred to as "psyching up," (Murphy, 1985). The phenomenon is identical to mental imaging; timing is the only variable that changes.

Imagery Research in Sport

Individuals possess the ability to create their own reality in their minds. Emotions, images, and sounds can be created consciously, in the absence of perceptual reality. Through a variety of psychological studies research has discovered that the possibility of realizing our hopes and dreams is increased through the use of mental imagery. This also is true in the field of sport psychology.

In the field of applied sport psychology, where hundredths of a second or tenths of an inch separate the champions from the rest of the competitors, the extra edge that proper mental preparation can give an athlete is a precious and much sought after commodity. Little wonder that there have been so many studies seeking to enhance the understanding of the connections between cognitive processes and performance (Murphy, 1985).

Human skills take many forms, ranging from those that require control of the largest muscle groups to those required to thread a needle. Without the capacity for skilled performance, humans would not have the wide variety of sports and athletic endeavors we do (Schmidt, 1991). It has long been known that in order to learn, or refine the performance of these skills, an element of practice is necessary. Practice has traditionally been viewed in terms of the overt, or physical performance. The amount of practice and learning that occurred was assumed to be a function of the period of time the individual participated (Snoddy, 1926), or the number of repetitions that were successfully completed (Newell & Rosenbloom, 1981). It has now been well documented, however, that mental practice, including imagery, can facilitate the improvement of skill acquisition and execution (e.g., Corbin, 1972; Feltz & Landers, 1983; Grouios, 1987; Oxendine, 1984; Richardson, 1967a, 1967b; Suinn, 1983; Weinberg, 1982).

Studying the effects of imagery on motor skills is not a new phenomenon. Novel skills studied include card sorting (Perry, 1939), mirror drawing (Siipola, 1935) and ring

tossing (Twining, 1949). In fact, attention was given to muscular activity during mental operations as early as 1892 (Jastrow, 1982). Since that time there has been a steady flow of research of this type. Currently, mental practice and imagery are a main interest in the field of sport psychology.

Imagery and Performance

Conventional wisdom holds that if one desires to learn, or refine a motor skill, it needs to be practiced repeatedly. What has been excluded from the term practice until recently is mental practice. Imagery is one such form. To date, over 300 studies have been conducted examining the relationship between the utilization of mental imagery and the learning or refining of motor skill performances. Studies range back to the years 1897-1898 when William Anderson, a physical educator conducted a series of studies (Wiggins, 1984). A large majority of the studies until the 1980s were concerned with the effects of mental practice on the learning and performance of motor skills and were nearly all based in the laboratory (Murphy & Jowdy, 1992). Although various experimental designs have been employed to study the effects of imagery on skill acquisition and performance, experiments have generally employed three or four different groups: (1) a physical practice group, (2) a mental practice group, (3) a combination group; and (4) a control group (Grouios, 1989).

Although the majority of studies have found a relationship between mental imagery and performance, some have not (Corbin, 1967b; Ryan & Simmons, 1981; Shick, 1970; Steel, 1952; Smyth, 1975). Within the last decades two reviews have helped clarify the situation. Feltz and Landers (1983) used a statistical approach the mental practice - performance question. They used a meta-analysis for 98 studies that used mental practice and a control group or pretest measure and were able to use the meta-analytic procedure on 60 of these studies, yielding 146 effect sizes. They found an overall average effect size of .48, somewhat better than no practice at all but consistently less effective than physical practice. Their analysis also revealed larger average effect sizes for cognitive tasks than for motor or strength tasks (Murphy & Jowdy, 1992).

Weinberg's (1981) content-based review of the literature produced equivocal results. Weinberg states, however, that certain findings do continue to emerge in the literature. Among the conclusions drawn by Weinberg is that mental practice combined with physical practice is more effective than either alone (Murphy & Jowdy, 1992). Summarizing the literature's complete findings Suinn (1985) has identified the following factors related to successful mental practice: a) it appears to be associated with low threshold muscular activity during practice; b) it appears to be most effective when used in conjunction with physical practice; c) it tends to work better with experienced performers; d) mental practice has its strongest effect on simple motor tasks; and e)

distributed practice appears to be more effective than massed practice. Studies conducted since then have continued to examine the effects of mental practice on learning and performance of motor skills using the same methodology as in previous studies but have introduced new and different variables, or conditions (Murphy & Jowdy, 1992).

One variable has been investigated by Andre and Means (1986), who manipulated the rate of imagery used. They hypothesized that the speed of rehearsal would influence the efficacy of mental practice, such that slow motion imagery might enhance the subject's experience. The results suggested just the opposite. The regular imagery practice group performed better on the post-test than the slow motion mental practice group.

One might also expect that if positive imagery is shown to enhance performance, it is logical that negative imagery would then be shown to decrease performance. Indeed, at least two such studies have examined this. The first was conducted by Powell (1973) in which subjects were asked to image themselves failing at a dart throwing task. Results found that the negative imagery resulted in poorer performances on the post-test than those imaging positively. Woolfolk, Parrish, and Murphy (1985) also found similar results on a golf putting task. Other variables that have been studied include: perspective of imagery orientation (Mumford & Hall, 1985), frequency of imagery (Hall, Rodgers & Barr (1990), emotional significance of imagery (Hecker & Kaczor, 1988; Murphy, & Woolfolk, & Budney, 1988), adding imagery to movement; also known as imagery simulation or body rehearsal (Martin, 1989a; Ross, 1985; Meacci & Price, 1985), and measuring imagery ability (Hall, & Pongrac, & Buckolz, 1985). All of these variables will be examined in this review.

The results of the recent mental practice research seem highly consistent with the results of past research. Mental practice appears to be better than no practice, and a combination of mental and physical practice is better than, or at least equal to, physical practice alone. The evidence, however, is not entirely conclusive as Murphy and Jowdy (1992) write:

Despite the long history of research into mental practice, it remains an open question just how effective mental practice can be in skill acquisition and retention. The strongest evidence for mental practice appears to be when it is combined with physical practice, but the literature contains no studies utilizing an appropriate control group that intersperses physical practice with rest periods. The need for such a control group is based on the motor learning literature, which consistently demonstrates that distributed practice (i.e., a practice schedule in which individual trials are interspersed with rest periods) is superior to massed practice (Fitts & Posner, 1967). It is possible that practice groups using mental practice merely serves as a rest

interval. Therefore, mental practice studies that utilize an appropriate control group must be conducted (p.225).

The effects of imagery on performance appear to be well documented; though they are not without criticism, and there is much we do not yet know. For now, it appears that imagery appears to be associated with low threshold muscular activity during practice; seems to be most effective when used in conjunction with physical practice; tends to work better with experienced performers; has its strongest effect on simple motor tasks; and distributed practice appears to be more effective than massed practice.

Theoretical Explanations for Imagery Effects

A sound theoretical basis for the relationship between imagery rehearsal and subsequent performance that can accommodate the extant empirical findings has not been developed to date. There exist two main theoretical formulas of mental practice in the sport science literature: symbolic learning and the psycho-neuromuscular theory. There also exists a myriad of additional or alternative theories: the attention arousal theory (Feltz & Landers, 1983; Vealey, 1987), the regional cerebral blood flow theory (e.g. Roland et al 1980a), the mental and muscle movement nodes theory (Mackay, 1981, 1982), the modeling theory (Weiss, 1983), the memory organization theory (Grouios, 1988), the selective attention theory (Bruner, 1960), the motivational theory (Grouios, 1989), the connectionist theory (e.g., Shaw, 1939, 1940; Schramm, 1967), the gross framework theory (Lawther, 1968), the insight theory (comes from Gestalt theory), and Lang's information processing model (1977, 1979), Ahsen's Triple-Code theory (Ahsen, 1984). Each of these formulations has not been able to provide a total explanation of imagery effects on performance (Kaczor, 1987). We begin by looking at the psychoneuromuscular theory.

Psychoneuromuscular Theory

Psychoneuromuscular theory holds as for an explanation of imagery's effects that the muscles involved in the skills imagined become slightly enervated during the imagery. The degree of muscle activation is large enough to cause kinesthetic feedback, that can be utilized to make skill adjustments on future trials (Murphy & Jowdy, 1992). This explanation has been proposed by a number of researchers (Corbin, 1972; Richardson, 1967b; Schmidt, 1987). This theory goes by many other names. It is sometimes known as the muscle memory theory (Vealey, 1987), or the feedback theory (Corbin, 1972), or the muscle potential hypothesis (Mackay, 1981), or the neuromuscular feedback theory (Harris & Robinson, 1986), and the mirror hypothesis (Feltz & Landers, 1983).

Psychoneuromuscular explanations of mental practice effects have a long tradition, and is the oldest theory for the explanation of imagery's effects on performance (Schmidt,

1991). As early as the end of the last century, Jastrow (1892) examined and found involuntary movements occurring during various mental operations. According to the ideomotor principal (Carpenter, 1894), an image will produce muscular activity similar to that during actual movement, but at a lesser magnitude. Washburn, in *Movement and Mental Imagery* (1916) also suggests that "tentative movements" occur during imagery. Jacobson (1930a, 1930b, 1930c, 1930d, 1931a, 1931b) researched the phenomenon extensively and too found that muscle activity during imagery was both specific to the muscles being covertly practiced and greater than while resting. Further evidence is provided by (Suinn, 1980; Bird, 1984) whom both found an increase in magnitude of muscle activation during mental practice and both studies found that bursts of specific muscle group activity correlated with the times one would expect them to occur during overt practice.

This phenomenon does not come without criticism, Mackay (1981) who calls it the muscle potential confound. As (Jacobson, 1930) noted, electromyography activity accompanies mental practice and under the muscle potential hypothesis, this electromyographic activity is fundamental to practice effects in general. As a result the motor side of mental vs. physical practice may differ only trivially in degree of neuromuscular activity. And studies such as Vandell et al's may demonstrate not that practice at a purely conceptual level can facilitate behavioral skill, but rather that mental practice is not entirely mental and that physical and mental practice have important physical processes in common. Experiments by Kohl and Roenker (1980) using a bilateral transfer procedure have overcome this muscle potential confound. Contrary to the muscle potential hypothesis, they found equivalent transfer of practice from one arm to the other for both mental and physical groups in a rotary pursuit task.

There still exists several unanswered questions with regard to the psychoneuromuscular theories; for example, are the adjustments in motor performance the result of conscious cognitive processes, or do they occur without consciousness? If unnecessary or interfering muscles are activated, what mechanism signals that this was an inappropriate response (Hecker & Kaczor, 1988)? The extensive research on this phenomenon does support the effects of imagery on muscle activation.

Finding a cause and effect between imagery and muscle activation during imagery is in itself not enough to entirely support the psychoneuromuscular theory. To do so, we must also find, as Murphy & Jowdy (1992) point out, a relationship between muscle activity during imagery and subsequent performance. They also state:

To date, results from studies examining the neuromuscular basis of mental practice in the psychology literature support the contention that the

muscular responses are an effect mechanism rather than causal of performance changes. Evidence to support a relationship between muscular activity during mental practice and subsequent performance in the sport-related literature has yet been obtained. The failure to demonstrate such a relationship is one of the most significant reasons for the current skepticism regarding the psychoneuromuscular hypothesis.

Feltz and Landers (1983), in their review of the mental practice literature, concluded, "it is doubtful that mental practice effects are produced by low-gain enervation of muscles that will be used during actual performance" (p. 233). So for now it appears that we can reject the psychoneuromuscular theory in its entirety. However, our understanding of the imagery phenomenon is largely unknown; and this theory should not be discarded entirely. Furthermore, the psychoneuromuscular theory may be of value as a model to describe the effect of psyching up.

Symbolic Learning Theory

The symbolic learning hypothesis is sometimes known as the symbolic-perceptual hypothesis (Denis, 1985). It was originally put forth by Sackett (1935) as the symbolic learning view. Sackett speculated that symbolic rehearsal, the acquisition and subsequent rehearsal of symbols that represent patterns of overt movements will facilitate the learning of skills, in which cognitive factors are predominant. Tasks primarily characterized by muscle movement would not be strongly influenced by symbolic rehearsal, according to Sackett.

Fitts (1962) identifies the first stage of learning as being primarily cognitive in nature. The learner spends time processing cognitive (symbolic) information. Imagery may assist in the organization of such data during the initial phases of skill acquisition. This is consistent with several findings (Minas 1980; Wrisberg and Ragsdale, 1979). These studies found mental practice to be associated with higher levels of task development in tasks in which the subjects had no experience. This is consistent with a symbolic learning theory. Other findings, however, have indicated that some prior experience with the tasks is necessary for mental practice to be effective (Corbin, 1967a, 1967b; Phipps, 1968). Minas (1980) proposes that this conflict may be resolved the basis of how familiar the subject is with the task. Mental practice may be impossible if the subject has no centrally coded information about the constituent movements of the task. But if the task, although unfamiliar, comprises known movements, mental practice may be effective despite lack of prior experience.

As a theory of imagery rehearsal this view presents one primary problem - although it can account for findings that mental practice facilitates early skill acquisition;

the symbolic learning view has little to say about performance enhancement of well learned athletic skills. Although the symbolic learning theory has shortcomings; two major bodies of research evidence have been relied upon to support this approach. First, a number of studies have shown that mental practice is more effective for tasks that have a high cognitive component, as opposed to a high motor component (Sackett, 1934, 1935; Morrisett, 1956; Wrisberg and Ragsdale, 1979). Second, theoretical accounts of motor learning arguing that the early stages of learning are primarily cognitive (e.g. Fitts, 1962) are compatible with the notion that mental practice will have its greatest effects during the early stages of learning.

A preponderance of studies have found greater mental practice effects with symbolic, as opposed to motor tasks; with the greatest body of evidence coming from the Feltz and Landers (1983) study. Feltz and Landers found that the effects of mental practice on symbolic tasks were greater than the effects on motor or strength tasks in their analysis of sixty studies using many differing methodologies (Murphy & Jowdy, 1992). In a replicated study of the Feltz and Landers (1983) study, Oslin (1985) found the same results.

Recent research has continued to support a cognitive processing or symbolic learning theory. Kohl and Roenker (1980) conducted a bilateral transfer study in which subjects practiced a task on their left hands. The transfer test showed that subjects who imaged the task with their right hands performed as well as those who practiced with their right hands. Johnson (1982) found that visual interference, opposed to motor interference, while imaging, significantly inhibited subsequent performance on a drawing task. Finally, Roland, Larsen, Lassen, and Shinhoj (1980) found that cerebral blood flow during imagery of finger movements increased in cortical motor of the brain.

The weights of evidence clearly favors the position that mental practice produces the greatest effects on tasks that are high in cognitive components. Although supportive of a symbolic learning process, research can not yet prove the symbolic learning position (Murphy & Jowdy, 1992).

Uses of Imagery

Psyching Up

The only difference between psyching up and imagery is in its timing. Psyching up refers to the use of mental imagery just prior to performance. Such an example was seen by Bob Beeman who stood at the runway before his 1968 Mexico Olympics gold medal performance in the long jump. With his eyes closed he visualized each and every movement he would make during the event; he opened his eyes and jumped two feet

farther than any man had. Today, such a sight is common. Researchers are substantiating the benefits of imagery that Beaman knew then today.

Mackay (1981) has suggested that imagery just prior to an event may in some form "prime" the appropriate muscles. It is even more plausible that psyching up affects a variety of physiological systems via its impact on the athletes' emotional state (Murphy & Jowdy, 1992). There exist only a few dozen studies regarding the effects of imagery on immediate subsequent performance. Most of these studies were done during the years 1977 - 1980.

One method was to examine the corollary relationship between cognitive strategies and performance. The first investigation into the corollary relationship between the cognitive processes of psyching up was employed by Mahoney & Avenier (1977). They examined the use of imagery and other mental qualities such as efficacy and concentration among gymnasts who qualified for the 1976 U.S. Olympic Team and among those who did not. This study and others (Gould, Weiss, & Weinberg, 1981; Highlen & Bennett, 1979; Rotella, Gansneder, Ojala, & Billing, 1980; Meyers, Cooke, Cullen & Liles, 1979) have found a significant effect size which suggests that successful athletes may be more likely to engage in mental imagery, and other mental processes than their less successful counterparts.

These studies are not definitive as they are often subject to many variables. The Mahoney & Avenier study (1977) examined other mental skills that were not directly related to imagery. Furthermore, these studies do not show a cause and effect relationship, simply a co-relation relationship. In fact, Heyman (1982) has pointed out that the outcome of performance over time may shape the self-efficacy of the competitor and is equally plausible in explaining the effect.

Another research design closely examines the nature of psyching up on immediate, subsequent performances. Again, researchers have examined more variables than the use of imagery alone. For example, in a study by Shelton and Mahoney (1978), subjects were asked to employ their favorite psyching up technique immediately prior to a hand grip dynamometer test. Their psyching up techniques included, but were not limited to imagery. Other techniques included attentional control, self-talk, and arousal control. These subjects significantly improved their scores over baseline, compared to another group that was encouraged to improve, but also given a distracting cognitive task.

Research examining specific affects of mental techniques has provided mixed results. Some researchers, such as Gould, Weinberg, and Jackson (1980) have found that preparatory arousal and imagery produced significantly better performances than

attentional focus, controlled rest, and a cognitively distracting task on a leg kick task. These same researchers found in a separate study (1980) that the three conditions of: imagery, attentional focus, and self-efficacy-talk, provided no significant improvement compared to a control group in a tennis-serving task. Utkus (1975) found that imagery just prior to a drawing task hastened time requirements and provided for fewer errors than a control group. However, Epstein (1980) found no significant affect between either internal imagery or external imagery on a dart throwing task. In a study reported by Woolfolk, Parrish, and Murphy (1985), it was found that negative imagery significantly decreased the performance on a golf putting task while positive imagery affected the task positively. In a follow up study by Woolfolk, Murphy, Gottesfeld, and Aitken (1985) it was again found that negative imagery decreased performance; however, this time positive imagery was not found to have a significant affect on the task. It is possible that some of the discrepancies are a result of the research designs themselves, Shane Murphy (1990) points out:

One of the major problems with the psyching up literature is that studies which ask subjects to utilize some psyching up strategy unfamiliar to them is probably not representative of real-life athletic situations. If the psyching up strategy employed does not fit the subject's cognitive style, the study may not be a fair test of the study's effectiveness. Perhaps future studies could make use of psyching up strategies already familiar to the subject...Also; interactions between various psyching up strategies have not been studied at all, although studies indicate that a majority of athletes use a combination of psyching up approaches. Finally, investigations into the relationships between imaginable rehearsal, task requirements, personality variables, and environmental influences are only in their infancy (p. 173).

To summarize the findings, it appears that imagery just prior to a performance has been found to enhance performance for some tasks and not for others. It is clear that the role of imagery on subsequent performances remains unclear. The nature of our research designs themselves may contribute to this ambiguity.

Arousal Regulation

Imagery has been extensively used in clinical psychology as a relaxation-inducing device (Murphy & Jowdy, 1992). This approach has been adopted in sport psychology as a way of calming the anxious athlete prior to competition (Harris & Harris, 1984). For example, a coach or sport psychologist might have an athlete image lying in a soft green meadow in a beautiful valley; the athlete can watch the puffy white clouds roll by as the light, cool breeze comforts the skin. This example serves the purpose of both

psychological disassociation from the subsequent event and helps bring about physiological relaxation.

Considerable research has been conducted on the arousal level of an athlete prior to performance and the quality of the resultant performance (Hall, 1943; Hanin, 1980; Hardy & Fazey, 1987; Martens, 1971, 1974; Spence, 1966; Taylor, 1956). Through an evolution of theories from Hall's (1943) drive theory to Martens (1974) inverted - U theory, and finally to Hardy and Fazey's (1987) catastrophe theory, it can be concluded that differing levels of arousal are required for different sports, competitors, and situations. A high level of arousal is likely required for a linemen in football; in order to prepare the body for a hit. While a low level of arousal would likely be required in archery; which requires precise motor control. Additionally, each competitor may perform best under a level of arousal that is germane to successful performances for that individual.

Imagery has been used in research to both increase and decrease arousal levels (Kavanagh & Hausfeld, 1986; Wilkes & Summers, 1984). Although research in this area is limited, findings suggest that imagery can be an effective tool for arousal regulation (Murphy & Jowdy, 1992). Theories explaining why imagery works as a relaxing or arousing agent have focused on emotive states (Lee, 1990; Murphy, Woolfolk & Budney, 1988) though this will be discussed later in this chapter.

Planning and Event management

Another use of imagery in the field of applied sport psychology is to prepare athletes cognitively for an upcoming competition. As with many imagery interventions, this technique has received scant research attention, but mental practice findings regarding the effectiveness of imagery rehearsal in organizing tasks in a conceptual framework suggest that this approach to event planning has merit (Murphy & Jowdy, 1992).

Although little research has been conducted on such imagery; coaches and sport psychologists have commonly employed imagery for this purpose. An example would be to have a runner image warming up over the course to be run, then imaging the actual race. The athlete may see where to make moves, and other key points of the race. An athlete may choose to image more than one scenario, allowing for variations of the event possibilities. Phenomenological observation tells the author that a tactic practiced regularly in imagery may result in the tactic being employed without conscious thought during the actual event.

Emotional Rescripting

This approach is similar to event planning but instead of mentally rehearsing their rational cognitive strategies, athletes rehearse their emotional response to competitive situations (Murphy & Jowdy, 1992). For example, a distance runner might describe to his coach or sport psychologist the emotions that occur while experiencing a myriad of variables related to racing. Such variables might include the emotional response of, for example, seeing a large hill in the course, being passed by another, leading the pack, going out fast, and seeing a normally slower runner in front. The athlete and coach then determine which emotions might result in decreased performances e.g., despair, panic, or desire to quit. The coach and athlete then devise strategies to replace these emotions with more productive ones. These strategies may include affirmations and cue word utilization; that is the process of initiating a physiological response through the use of a word. Finally, the athlete images himself racing under the scenario that elicits the original response, and the athlete cognitively sees himself coping with the situations. He may desire to use revivification (recalling a prior experience and the emotion attached to it, bringing it to the conscious and applying that emotion to the present situation) to attach a more productive emotion to the script.

Other Imagery Uses

A number of other uses for imagery exist. Imagery has long been used for desensitization (Wolpe, 1958), coping (Meichenbaum, 1977), and behavioral change techniques (Bandura, 1977). It is believed that these techniques work because the images we hold of ourselves are a major source of self-esteem and individual efficacy. Self reports from athletes who regularly image report that confidence changes often accompany imagery rehearsal (Murphy & Jowdy, 1992). Imagery has also been used in pain control (Epstein, 1989; Jaffe, 1980; Levine, 1982). Imagery is closely associated with hypnosis, which has been found to reduce clinical pain with patients susceptible to hypnosis (Wadden & Anderson, 1982). No research has been conducted on imagery and injury prevention, but evidence from other areas of psychology suggest that this also might be possible (Lloyd, 1987). Chapter 14 will discuss the use of visualization to aid the runner. Techniques such as transmogrification; in which the runner sees himself as another or perhaps an animal or machine, is used to disassociate from the body. Disassociation will be discussed thoroughly in chapter 18 as well.

Imagery Perspective

Although the evidence is not entirely conclusive, most researches are content in believing that imagery, although not as beneficial as overt practice, is at least better than

no practice at all. As mentioned previously, researchers are now examining individual variables within the imagery field. Some of these variables include: psyching up, intervention, frequency of use, and imagery perspective. Currently, researchers investigating imagery have attempted to determine the imagery perspective that is most beneficial in the acquisition and execution of motor skills. Mahoney and Avenor (1977) have categorized imagery perspectives into two conditions: internal and external.

The external perspective is identical to watching oneself on film or tape. The athlete sees himself from the perspective of the camera. The internal perspective views events from your own eyes. This perspective is also known as a phenomenological perspective. This approach has been associated highly with the psychoneuromuscular theory because the individual experiences the events from within his own body. In doing this he/she may include kinesthetic awareness, and may feel muscular movement. The question remains which perspective works best, and under what conditions?

Many studies have analyzed perspective frequency between successful athletes, and their less successful counterparts. The first research in the area was done by Mahoney and Avenor (1977). This study found that elite male gymnasts qualifying for the Olympics utilized the internal perspective significantly more than the non-qualifying gymnasts. Since then many researchers have found similar results. For example, Rotella, Gansneder, Ojala, & Billing (1980) found that higher skilled skiers took the internal perspective more frequently than did lesser skilled skiers who took the external perspective. Mahoney, Gabriel, and Perkins (1987) found in a survey of hundreds of athletes that elite athletes are more likely to adopt the internal perspective than non-elite athletes. Other studies have failed to demonstrate a significant difference between perspective and ability. Meyers, Cooke, Cullen and Liles (1979) were unable to find any differences in imagery perspective for either elite or collegiate racquetball players. Highlen and Bennett (1979) reported similar findings for their study of elite wrestlers.

A few researchers also have examined the relationship between imagery perspective and performance. Epstein has done two such studies. In the first (1979) Epstein found that external imagery was associated with shaky confidence and distractibility in track athletes. Later, in an experimental research design, Epstein (1980) assigned subjects to a control group, an internal imagery group, and an external imagery group. She found no significant differences among the three groups on a pre-and post-test for a dart-throwing task. However, Mumford and Hall (1985) suggest that this may be due to the lack of training the participants received, as their training was less than five minutes.

McFadden (1982) tested a hockey goaltending skill by dividing the subjects into four treatment groups: internal, external, and two control groups. Significant improvement was found in both imagery groups; however, there were no significant differences between the internal and external groups. These results led McFadden to conclude that the researcher needs to consider the kinesthetic and/or proprioceptive feedback requirements of the sport under analysis. McFadden suggests that in a sport requiring mostly kinesthetic awareness, such as running, the athlete may benefit most from an internal perspective; in contrast in a sport requiring proprioceptive feedback, such as ice-hockey, the athlete may benefit most from an external perspective. Mahoney and Hall (1985) used three different types of imagery (i.e. internal kinesthetic, internal visual, and external visual) and found no difference between groups on figure skating performance.

Research examining the neuromuscular basis of imagery and perspective have found the internal perspective responsible for producing increased muscular activity while imaging; while the external perspective produced no significant difference (Hale, 1982; Harris and Robinson, 1986). Harris and Robinson also found that subjects switched imagery perspectives during the sessions.

Results from these studies illustrate the inconsistencies in results of the imagery perspective research. As of yet, researchers are unable to draw a conclusion as to which perspective yields overall better results. It is clear that the form of skill being imaged, the experience and preference of the imagery, and the task acquisition or execution desired are all variables that might lend themselves to the effectiveness of the imagery use. Researchers also might be advised to examine the effects of different perspectives as it relates to each of these variables.

Imagery Ability

The ability of an individual to use mental images is referred to as either imagery ability or competency. There are two factors involved in imagery ability, vividness, and controllability (Sheehan, Ashton & White, 1983). Vividness refers to the clarity of the mental image as experienced by the individual, while controllability refers to the ability of the individual to exhibit conscious control over the image (Turner, 1989). Together these two variables are known as imagery competency.

The issue of control was first brought to light with Clark's (1960) research on the effects of mental practice on performance; when he instructed a subject to see himself bouncing a ball just prior to a basketball foul shot. The subject reported that the ball would not bounce; it merely stuck to the floor. Clark described this as an uncontrollable image. The issue of vividness emerged early in the 1900's with the Betts Questionnaire Upon Mental Imagery (1909). This questionnaire has since been revised by Sheehan (1967)

and is known as the Vividness of Imagery Scale, and along with the Vividness of Visual Imagery Questionnaire (Marks, 1973) and the recent Movement Imagery Questionnaire (Hall, Prongac & Buckolz, 1985), is a major assessment tools for imagery ability.

In line with other variables of imagery, research has been conducted on the relationship between imagery competency and performance. Researchers have been interested in whether it is possible to predict motor task performance from variations in imagery ability. That is, they have attempted to determine if there is an advantage to being an imager with higher abilities (Hall, Buckolz & Fishburne, 1989). The research has produced mixed results. Meyers, Cook, Cullen & Liles (1979) found that better racquetball players possessed better control of their imagery. Similarly, Highlen and Bennett (1983) found that divers who qualified for the Pan-American Games rated their imagery as more vivid and controlled than did divers who did not qualify. More recently, Orlick and Partington (1988) found that in a sample of male Canadian Olympic athletes the use of kinesthetic imagery (highly associated with imagery competency) was significantly correlated with successful performances. Start and Richardson (1964) found no relationship between either vividness of imagery or controllability of imagery in learning and performing a gymnastic skill; however, some evidence was found to suggest that low competency individuals performed poorer than all other individuals.

Ryan and Simmons (1982) reported that subjects charged with the task of balancing themselves on a stabilometer improved significantly more when they reported strong visual images, as opposed to those with weaker visual images. It also was reported that subjects who reported strong kinesthetic imaging were superior to those with weak kinesthetic imaging. In contrast, Hale (1982) examined at the effects of imagery on performance in an imagined dumbbell curl. There proved to be no significant relationships between electromyography of biceps activity and the kinesthetic ratings given on either of the two questionnaires employed. Epstein (1980) considered individual differences in imagery in a study that investigated the effects of a dart throwing task to a questionnaire concerning clarity, difficulty, ability to concentrate, auditory sensations, olfactory sensations, tactile sensations, and kinesthetic sensations. Results showed that performance for males was positively correlated with auditory, tactile, and olfactory ratings while performance for females was correlated only to auditory imagery. White, Ashton and Lewis (1979) considered imagery ability in a study that examined the effects of imagery on a swimming start. Individual differences in imagery ability were measured by Sheehan's (1967) adaptation of the Questionnaire Upon Mental Imagery (1909). Although it was found that mental practice had a positive effect on subsequent performance, imagery scores were not related to performance improvement scores.

Goss, Hall, Buckolz, & Fishburne (1986) categorized subjects into three groups depending on their scores on the MIQ: high, medium, and low visual-kinesthetic imagers. Results showed a significant difference between the high and low groups on the acquisition of movement patterns; however on a retention test no significant results were found. Research on imagery competency has come from other disciplines as well. From the psychological literature Dyckman and Cowan (1978) found that imagery vividness was significantly correlated with therapeutic processes. Shaw (1940) showed that subjects who reported high imagery vividness show higher levels of subliminal activities during movement imagery than their respective counterparts. Finally, Housner (1984) showed that subjects with high imagery ability reproduced movements with significantly greater accuracy than those with low imagery abilities.

Many of these studies lend a great deal of support to the notion that mental imagery can improve the acquisition and performance of a motor task. Furthermore, it was found that mental imagery can contribute to enhanced motor skill acquisition and performance, common sense dictates that the quality of imagery should affect the level of skill development; just as the quality of overt practice affects skill development. It is therefore suggested that athletes with high imagery abilities will benefit more from mental imagery processing on the acquisition and execution of motor skills, than those with low imagery abilities.

Imagery Use

One of the first systematic studies on imagery use was conducted by Betts (1909). He investigated the use of mental imagery on a variety of tasks, including simple association, logical thinking, mental multiplications, and discrimination judgments. He concluded that imagery often is used in doing these tasks, but that it is more helpful in certain tasks than others and is probably not employed as much as might be expressed (Hall, Rodgers & Barr, 1990).

Unfortunately, there exists very little literature relating to the use of imagery by athletes. The information that does exist is largely descriptive in nature and has been collected through anecdotal reports of athletes, athletes' interviews, and general post-performance evaluation questionnaires (Hall, Rodgers & Barr, 1990). Many studies have looked at how athletes use imagery, or the effects of their imaging, but until the development of the Imagery Use Questionnaire (IUQ) (Hall, Rodgers & Barr, 1990), no formal study of imagery use by athletes had been conducted. The authors discuss their first use of it:

To further our understanding of the use of mental imagery, a questionnaire was developed and responses to it were collected from a large sample of

athletes. Comparisons were made between athletes at various skill levels since there is some evidence that elite athletes use imagery differently than do non-elites. The research is viewed as a preliminary investigation since only athletes in a limited number of sports were administered the questionnaire, and the questionnaire by necessity was very general in scope. Sport specific questionnaires can provide the more detailed information that coaches and athletes would ultimately like to know (p. 2).

Summary

Imagery research has had a long history in research literature; it has been studied since the late 1800s (Carpenter, 1894; Jastrow, 1892). In recent history there has been a preponderance of evidence to indicate that imagery has a positive effect on the development and execution of motor skills (Feltz & Landers, 1983). In contrast, the development of theoretical models to explain the mechanisms underlying the imagery effect has progressed slowly (Murphy & Jowdy, 1992). Though several models exist, none has been able to provide a total explanation of imagery effects on performance (Kazcor, 1987).

Uses of imagery vary widely. Mackay (1981) suggests that imagery just prior to an event may in some form “prime” the appropriate muscles. Imagery used in this sense is known as psyching up. Imagery has been used in arousal regulation as well (Harris & Harris, 1984) as a way of calming the anxious athlete prior to competition. Murphy and Jowdy (1992) suggest that imagery may serve well in planning an event by organizing tasks into a conceptual framework. Or, instead of rehearsing their rational cognitive strategies an athlete can rehearse the emotional responses to the competition (Murphy & Jowdy, 1992); this is known as emotional rescripting. Whatever use of imagery one chooses he/she may also choose a perspective in which to utilize. There are two forms: 1) the internal perspective views events from the eyes of the competitor; and 2) the external perspective views events from the eyes of another. Researchers are currently investigating which perspective is most beneficial to the acquisition and execution of a skill (Mahoney & Avenor, 1977).

Finally it has been found that athletes vary in their ability to control an image, and in the clarity in which they see it (Clark, 1960). Several instruments have been developed to measure such (Betts, 1909; Sheehan, 1967; Marks, 1973; Hall Prongac & Buckolz, 1985). There exists very little literature relating to the use of imagery by athletes but the development of the Imagery Use Questionnaire (Hall, Rodgers & Barr, 1990) has prompted some research in this area.

Sample Mental Training Session

"Relaxation before a visualization session is important because it creates a receptivity in the mind that enhances the depth of the visualization", says Kay Porter.

1. Turn the lights off. *"Lie down on your back, hands at your sides, close your eyes."*
2. *"Achieve a comfortable position; scratch, stretch or whatever it takes to get comfortable, but no talking, please."*
3. *"I want you to concentrate on slowing your breathing down. Pause at the top of each inhalation, and pause at the bottom of each exhalation. Feel your stomach rise as you inhale and fall as you exhale. Slow and deep. Slow and deep. Slow and deep."*

I do this until I feel that the runners have calmed down. Then I use a little hypnosis.

4. *"I want you to listen to the sound of my voice and nothing else. Countdown five breaths; with each one you feel heavier and heavier (you may wish to use lighter and lighter). FIVE. You are feeling very relaxed. FOUR...You feel as if you are sinking into the ground. THREE...You are feeling heavier and heavier. TWO...You are sinking deeper and deeper into the ground. ONE ...You are very relaxed now, totally relaxed."*

The following allows the runner to achieve total body relaxation. By continually using the key word "relax" a runner will learn to step up to the start line and say to himself "relax" and his body will be trained to instantly become totally relaxed.

5. *"When I say to you GO you will tighten all the muscles in your legs; and they will raise off the ground about six inches. When I say RELAX you will let them drop. They will be very relaxed and you will not be able to move them. They will be separated from your mind. Ready; Go 1,2,3,4,5,6,7,8,9,10 Relax! You can no longer move your legs, they are separated from your mind."*

I then repeat the procedure for the abdominals and buttocks, the arms and hands, the face and neck. I conclude with all the muscles in the body at once.

The following will build the ability to concentrate. The number "ONE" is significant in building confidence.

6. *"I want you to picture in your mind the number ONE. Let no other thought enter your head but the number ONE. If any other thought should enter your head, simply push it out with the number ONE. Think of nothing but the number ONE." I let them envision the number ONE for a longer period of time each session. Perhaps thirty seconds is a good place to start.*

The next step is to describe a typical race scenario to the runners. Ask them to just imagine that this is happening to them. Start with the warm-up, and work through to the warm-down. Include all the preceptory senses, but introduce them one at a time. At the point of the kick, all the senses should be utilized to make it seem real.

7. *"See yourself traveling to the race. You arrive at the meet, step off the bus and take your bag over to where your team usually stretches. See yourself beginning to do a warm-up. You are jogging lightly and talking to your teammates. Hear your teammates talking about the upcoming race.... You have been jogging for a few minutes now and you begin to break a sweat so you head over to the grass to stretch."*

“See yourself stretching, pulling gently on your strong muscles. Hear yourself telling your teammates about how well we are going to race. Feel a little nervousness in your stomach. You have stretched adequately and you hear the first call for your race. You put on your racing flats and proceed to do a few strides. You feel loose, and relaxed. See yourself striding along with perfect form, loose and relaxed. You go to the starting line, shake the hands of your opponents and teammates. The gun goes off!”

“Take off quickly as to insure a good early position. Your elbows are out to push away anybody who might try to cut in on you. Now you settle into your race pace. You fall in behind another runner. He is breaking the wind for you, he is doing all the work. Feel yourself running totally relaxed. Your fists are relaxed, your shoulders are swinging smoothly and freely, your jaw is loose and open, and your entire body is totally relaxed.”

“The runner in front of you is starting to drift away from the pack so you pull out from behind him, passing him swiftly so that he will not try to stay with you and you pull in behind another runner. Focus on the back of the next runner and work on your relaxation. You come around a corner and hear your coach yelling for you. Hear the crowds cheering for you. See yourself running effortlessly, totally relaxed, confident that you are going to win this race.”

“You approach the (whatever lap or mile mark) feeling totally relaxed, totally in control. You begin to feel fatigued, but this will not slow you. You hear the crowds cheering for you and it inspires you to throw in a surge, as you pass the guy you were following. Working hard now you can feel the sweat run down your face. A drop of this sweat runs into your mouth and you can taste the salt.”

“You see a hill approaching. You feel confident that you are going to make up ground on this hill. You bound easily up the hill knowing that you will make twice the ground when you surge at the top of the hill. It is a long hill and a grueling one. Feel yourself running up this hill totally relaxed. You are running on your toes with a good forward lean, short strides, pumping the arms. The crest of the hill approaches and you pick up the pace. The leader is dying on the top of the hill. You focus on his back, feeling totally relaxed, you draw his back closer to you while remaining totally relaxed. Hear your coach yelling for you. You catch up to the leader and pass him quickly. Now you are the leader.”

“You approach the (1/3 of the race to go) and you feel confident that you are going to win this race. Although you are fatigued you are totally relaxed. The runner you passed is closing in on you, hear the pitter-patter of his feet. You pick the pace up a little, but you are tired. Smell the sweat, and feel the heat rising off your body. Hear his foot steps approaching, closer and closer, until he passes you slowly and you drop in behind him and focus on his back. Focus right in on the tag on the back of his jersey. Stare at that tag and concentrate on it. Some sweat runs into your right eye, and you feel it sting a little, you hear the roar of the crowds as you approach, totally relaxed. You feel your self running behind, totally, totally relaxed. Feel your muscles running with perfect form, hear the pattern of your footsteps, hear your breathing, feel the heat rising off your body, totally relaxed.”

“The finish line is in sight, you decide that you are going to use a jump kick. You’re just waiting for the slightest sign that your opponent is beginning to fatigue. You see it, a subtle skip in his stride. This is the moment. Take off quickly, surprising him. Accelerate past him, driving the arms, hear the crowds cheering for you, lifting the knees, hear your coach yelling for you. Feel the sweat running profusely, feel your muscles sprinting with absolute perfect form, feel the heat flowing off your body. You can hear your opponent’s labored breathing close behind, you are striving for that finish line, pumping the arms and driving the knees, totally relaxed. The tape becomes closer and closer, you smell the hot, dry air, hear the crowd yelling for you. Thirty yards...totally relaxed, twenty yards...driving the arms, ten yards...one last effort as you hear your opponent very close, you hit the tape! You won! You hear the crowd cheering for you; your teammates come over and hug you. You are proud of yourself. You turn around and shake your opponent’s hand. You cheer on the rest of your teammates as they sprint in.”

“After they are all in, you proceed to do a warm down. You feel yourself jogging easily, totally relaxed. Feel your muscles running smoothly, with perfect form. Your teammates come over and jog with you. You jog for awhile, then put on your sweats. You are proud of yourself; you worked hard, and deserved to run well.”

Typically, I will observe sweat running from my runners' faces during the visualization. I will also see some physical signs that their bodies actually believe the race is real. Runners frequently report to me that they can feel their hearts racing during the visualization. The body actually believes that all this is real. Tricking the body like this allows for the nerves to establish a smooth, relaxed running form, without running!

I now bring them “back to life”.

8. *“I want you to forget about running now and listen only to the sound of my voice. With each number you will become a little more awake. FIVE...feeling a little more awake. FOUR...twitch your hands. THREE...wiggle your feet. TWO...open your eyes. ONE...you are awake.”*

Sometimes, before I bring them back, I will do more concentration exercises with them. These exercises may also be done while putting them under before the visualization. For more on concentration continue to read this chapter.

When I bring them back they may be tired and lethargic. Some may have fallen asleep; which is fine.

Turn the lights on and assure that all are awake. Now the coach is provided with the optimum time to talk to his runners. They are tired; thus all ears. I often discuss racing strategy or team problems. After the discussion is over, I tell them to go run and practice what they have learned.

Visualization Tips

- I recommend that a runner make a tape of his own voice (which is more powerful to the subconscious than someone else's voice) and play it every night as he goes to sleep. “Repetitions of listening deepen the neural patterns in the brain, and physical responses become more automatic”, says Porter.
- I also recommend envisioning a particular upcoming race several nights in advance. If the athlete runs the race over in his head many times, then when the actual race is run he will have already done it, and he will just have to act it out.
- When visualizing, athletes report either seeing the pictures from within their own bodies, out of their own eyes, or seeing themselves as an outsider observer. Either way of imaging is fine. Actually, it is important to learn how to do both. Seeing yourself from outside will allow you to observe all facets of your form. Seeing from within your own eyes is important to know how you will see the actual experience.
- It is best to always speak in positives. For example: Rather than saying, “You don't feel tired”. Say, “You feel full of energy”. Recall that our brains only store positives.

- I recommend changing race scenarios frequently and always incorporating strategy into the scenarios. If, during the visualization, the coach says, "See yourself taking four quick steps around each corner", the athlete will do so in the race without thinking about it. It will become habitual.
- When runners become proficient at visualization, I will often add distractions. For example: If I am having the runners visualize the back of another runner, I will pound on the walls, or make some noise to challenge their concentration.
- The coach may decide to do the visualization along with the athletes, which allows him to know just how long to perform each segment, or he may wish to pace back and forth. The trick is to remain a constant. He should not sit quietly for most of the session, and then stand up and walk around. Later, when the runners are proficient in visualizing, he may do so.
- As the athletes become more proficient at the relaxation techniques you will find they can become totally relaxed upon the cue word within moments. Thus shortening the duration of the sessions throughout the season.
- When you desire to practice a scenario in which you come from behind, or in some way make up for an "error" then see all of the other runners in scene as "blue people." This way you prevent making a self fulfilling prophecy out of a runner in particular. For example, instead of seeing a runner from school x pass you, see a blue runner pass you.

Making Your Weaknesses Your Strengths

"Don't oppose forces, use them". I find this quote to carry much weight. As a high school health teacher, I utilize the current trends rather than trying to fight them. While educators are currently up in arms about the television show "The Simpson's" I am utilizing their popularity, indeed their relevance, in my classroom to explain the dysfunctional family. Why? Because attempting to fight something so strong is useless, if you can not fight it, use it. This great saying proves its value time again in running. Utilizing forces will enable you to better yourself, and your competition.

Through the use of self-talk, affirmations, visualization, and self-fulfilling prophecy it is quite possible, and most likely, that you can make your weaknesses your strengths. I have previously used the example of the runner who is weak on hills. I wish to use it again since it is the weak point of many runners' races. You might start off by developing an affirmation. Repeat it daily, read it, say it. Next, you need to develop the habit of

talking about hills (or whatever your weakness is) in high regards. I am not saying to lie. I simply mean to befriend it. For example, if you have had particular trouble with “Heart Break Hill” change your speech from, “God that hill is such a bitch” to “God I love the challenge of that hill”. If you have problems from the third to fourth miles in a 10K, then you change your speech from “I just hate that fourth mile” to “That fourth mile sure brings out the best in me”. The concept is to befriend your weakness. View it as a challenge, or better yet view it as a place to gain ground on your competition. “I know everybody has a hard time with the fourth mile, so I pick it up there.”

The next step is to visualize yourself conquering that hill or mile with ease. See yourself bounding effortlessly up that hill, or striding with speed and relaxation that fourth mile. The visualization will not only help to reprogram your subconscious, it will help develop the neurological pattern necessary to do so.

After you develop your affirmations, befriend your weakness, and develop your neurological patterns and confidence through visualization, it is time to gain practice in the matter. Run more hills, push that fourth mile of the 10K hard. With the new dose of confidence programmed from your affirmations, the positive feelings you have toward that ex-nemesis, and the necessary training, you can turn a weakness into a strength.

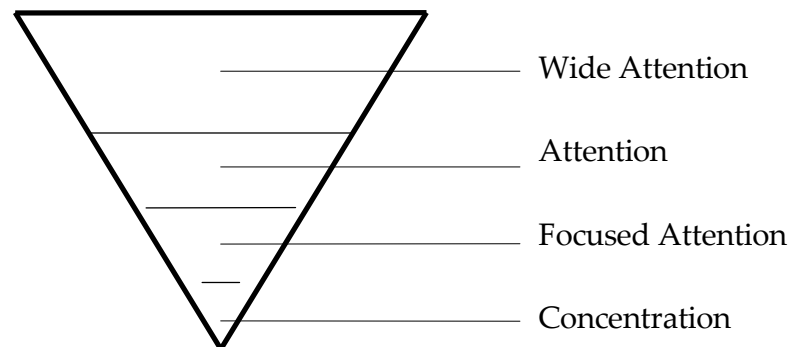
1. Develop affirmations
2. Befriend the tyrant
3. Visualize
4. Practice in that area

Part 3: Racing

Concentration and Attention

“The ability to concentrate is an element that separates the merely good athletes from great ones. Concentration is the hallmark of the elite runner.” - Hal Higdon. The duration of distance running demands the ability to concentrate for great periods of time. Concentration is the ability to focus your mental energies onto one specific detail. This is a difficult matter for many as our mind are used to thinking about many subjects continually. In fact, according to Porter and Foster, our minds have about ten million thoughts per day. The ability to focus all conscious thought onto one variable is what is meant by concentrating. During the race, your concentration is taxed by many other

factors affecting you. There is ample time for your mind to wander. You get inattentive, and then the mistake happens. You suddenly find the runner you wanted to stay with has twenty yards on you, or you find your pace has dropped. Fortunately the inward focus required in distance running can be developed and practiced.



Attention is the opposite of concentration. Attention means that you're aware of the various stimuli in your environment (Elliot, 1984, 68). We can adjust our attention span to a broader or narrower focus. When driving you are paying attention to many factors, you have a broad sense of attention. "The runner who shuts out the sound of the crowds is narrowing his attention", according to Elliot. When we focus all of our attention onto one area, we are concentrating.

Rarely, if ever, does a runner want a broad attention span while racing. It is fine for a training run, but in a race, there are too many important details to pay attention to. At times the runner desires a medium span of attention, such as during the early miles of a marathon when the runner takes in the sights and sounds, occasionally monitoring pace and form. This serves to help pass time. Then there are times when a runner needs a narrow attention span, like during the second mile of a 5K, monitoring breathing, form, pace, tactics, and pain. Lastly, there are times when the runner downright needs to concentrate. These are the times that can determine the actual outcome of a race: concentrating on holding a tough pace near the end of a race; concentrating on breathing deep and running economically up a long hill; concentrating on sprinting form in the closing meters. These are not times to think about the bills you have to pay, or even the time to think about the crowds cheering for you. These are times that necessitate strong inward focus. Focus that will enable you to perform at your peak.

Still there are times when thinking is not permissible at all - you simply need to react. The sprinter who thinks about the gun fire will already have lost the race. The runner who has to think about changing his form as he runs up and down the hills will tie

up the conscious mind and prevent it from dealing with other factors that could help you get up and down faster. . In distance running, the longer the event the more opportunity you have to think. The more unpredictable and changing the event the more necessity you have to think. "The more you have practiced, learned, and programmed your performance, the less you have to think", says Richard Elliot. Unfortunately, concentrating too hard at the wrong time can be trouble. I had a runner who was winning his league championship race with a half a mile to go. He was concentrating so hard that he missed his turn. He habitually continued to run down a path that he had run several time before; forgetting it was a different course.

Most of us have extensive practice in learning to narrow our focus of attention. We do so while reading, studying, watching television, talking, whatever. However, truly concentrating is not something that we normally do on a daily basis. We may concentrate for short periods of time, like when throwing a dart or putting a golf ball. But we rarely concentrate for longer periods of time. Practicing concentration skills is most valuable to the distance runner.

To practice the art of concentration you should include concentration exercises as part of your mental training session. You will note that in the example of visualization I previously gave (this chapter) I included concentration activities in the order of focusing on the number one. You may also choose to do a concentration run (see Chapter Four). Or you can enhance your abilities to concentrate by simply concentrating on anything. Stare at a particular word on this page and concentrate on it. If you find your mind wandering, as it undoubtedly will, accept that thought and then focus back. You are improving your ability to concentrate. Concentrate on a sound you hear outside, or a color (preferably blue since it makes you happy). Stare at an object, be fascinated with it. By contemplating the single object and holding your thoughts on it you will quiet your mind and strengthen your attention. It is OK for stray thoughts to enter your consciousness. Recognize them, consider them briefly, and let them pass out of your mind as you return your attention to the object. If you think "Don't think of anything else" you are not thinking of the object you are thinking about not thinking.

To develop your abilities to focus your attention on a narrow span of inputs, you can continue to read. For as you read you are reading what is said, contemplating it, and evaluating it; three critical skills. Or you can focus your attention onto your form and pace during a training run. This is not as difficult as practicing straight concentration, but it too is crucial toward successful racing.

Praise

By in large, true, honest, from the heart praise is a wonderful thing. We need praise, children and young adults especially. They yearn for someone they love and respect to say, "Hey, you're OK". Praise may come from actions as well as words. A pat on the back, a strong hand shake, an approving nod of the head, sparring, wrestling, or getting him into a head lock and proceeding with the noogie rampage, all are powerful ways of silently giving praise.

While praise can be encouraging, it can also contribute to anxiety and fear of failure. Praise can easily become manipulated and underhanded. We all know the salesman's pitch, "You're an intelligent person and as such you know that..." To keep praise in high regards there are a few simple rules.

- Keep praise honest.
- Don't use praise to soften the criticism, "You ran well but..."
- Avoid using praise to pressure athletes. "You always do so well..."
- Praise is generally not welcomed after a defeat. Praise after a poor performance can be considered condescending. If the runner knows he had a slow race, saying he didn't is only putting down his abilities, he will resent it. Simply show support (see Five Stages of Loss, this chapter).
- Coaches and parents are encouraged to praise and praise often. Do realize however that praise is welcomed but can also be embarrassing, especially in front of peers.
- Be careful, praise can be used to unintentionally punish others. If the coach points out 5 runners and praises them, the others may think "I guess I'm not good enough for praise." For this reason, individual praise is often best left an individual thing.
- Praising the team in front of the team is highly appropriate.
- Praise is an evolutionary process, you will learn how to utilize it best through a slow process, don't push it. *"Great coaches are gumption generators, having a talent for inspiring others and making them believe in unlimited potential."* - Richard Elliot

Cheering

“If you lean from your front-row seat in Madison Square Garden and holler, “Looking good!” to Eamonn Coghlan during an indoor mile, you won't be doing him any favors. He wants to be focused; he does not want his concentration broken. But if you and 18,000 other fans let out a collective roar, he can channel that energy in to a peak performance (Bloom, 1991, 43). Craig Virgin, a three time Olympian also considers himself a performer in the hands of the audience. “At Bislett Stadium in Oslo, spectators bang their hands rhythmically on the retaining wall. That really inspires me,” he says.

“That most runners seem to thrive on the souped-up sideline support is undeniable. But what is it that compels runners to go that extra effort? Why is it some individual comments will inspire and others fail? What do you say to a runner in distress? How spectator encouragement affects competitive performance depends on many factors: who does the cheering, race distance, how the athlete feels, the runner's personality type, and whether or not the runner has a psychological need for such affirmation are all factors”, says Marc Bloom in an April 1991 *Runner's World* article.

“Generally, world class runners are more able to distinguish comments they can use from those they cannot. Highly competitive runners may also be so driven that they do not need crowd support. In one study cheering on runners on a treadmill test with standard comments like “looking good” did nothing to change their aerobic capacities or perceived exertion, and actually annoyed them. Further research showed that encouragement tends not to help type A personalities but does their more mellow, less self-motivated, counterparts”, says Bloom.

General support, tends to do most runners good, most of the time. Sayings like, “Go Jeremy” or “Come on Mark” are perfect. They are comments that simply say, “Hey, I am here to support you and I want you to know I care.” That my friends, is what runners desire to hear. We just want to know that you are there, supporting us. We don't want coaching, 2.23 mile mark splits, or inaccurate place counting's, just support.

Some comments that are intended to do good may actually do harm. Marc Bloom in his article [The Roar of the Crowd](#), *Runner's World*, April 1991, explains that the old comment of “looking good” may be detrimental to a struggling runners performance. A comment like that can force the runner to focus on how he actually looks, and that may not be good. You are calling attention to his weaknesses. Also, runners reduced to a survival shuffle don't want to be told to lift their knees, or to go faster, they can't. This remark may be taken as critical and hinder the runner further. All runners respond well to hearing their name yelled; this personalizes the event.

Fear and Nervousness

"Failure is not defeat until you stop trying." Fear can be either a motivator or a destroyer in our lives and in running. Fear can prevent us from taking on the challenges, from trying something new, or from attempting at all. Fear can create self-doubt, confusion, and a panic stricken, physically tensed state. What are we afraid of? Primarily of losing face, looking stupid or, of failing (Porter & Foster, 1990, 150). We fear for our self-image. The fear of negative physical consequences, such as pain, is insignificant when compared to the fears that relate to self-image.

- Fear of not living up to our expectations
- Fear of looking stupid
- Fear of humiliation
- Fear of disapproval
- Fear of not looking good
- Fear of being blamed
- Fear of making a bad impression

Loss of status, loss of face, loss of opinion, loss of other's approval; these are the things we fear. We find ways of protecting ourselves, but they don't always work well. The ways we find often lead to more of a loss of face than the original fear. Living in a culture that puts great emphasis on success generates pressure on athletes to perform well, to avoid mistakes, to win, to be on top. Fear of failure leads to feeling miserable and confused. Fear of failure leads to a loss of confidence, a loss of the feeling that "I can do it," and a loss of trust in oneself to make judgments.

Even winning and being successful does not always help the fear of failure. We can't always be successful, and the experience of success may make failure even more devastating because of unrealistic expectations for the next race. For many runners the fear of failure is not the fear of failing in a race as much as it is the fear of not measuring up to the coach's or parent's expectations. Parents, especially, in their concern for their children, can put pressure on their children that discourages them. There are many myths about the fear of failure: the following are taken from *Teaching through Encouragement* by Martin Robert, Ph.D.

Myth # 1 - "It is better to try and to fail, than not to try at all." This may be true for those of us who have had enough success not to be discouraged by failure, but people who constantly experience failure often feel that it's better just to not try; then they don't have to feel bad when they fail again. This concept does not apply to actually winning a race, this applies to someone who is not in shape to race well yet, or to the lesser

experienced athlete who is put in with the Varsity. It is better to allow people to be as successful as they can in whatever race or division they can.

Myth # 2 - "Fear of failure is caused by parents or coaches." Certainly some athletes develop their fear as a result of ridicule, humiliation, or punishment at the hands of ignorant or sadistic parents or coaches. Unfortunately our culture teaches us to use discouragement rather than encouragement as a means of motivation. Society is at fault. It seems more instinctive for the parent to say, "You don't want to lose do you?" than to say, "How good do you want to be?"

Myth # 3 - "Fear of failure is a good motivation." If you think back to an experience where you applied yourself to a race because you were afraid of doing poorly, you will recall that you probably did poorly. It is the hope for success that is the real motivation.

Myth # 4 - "Only poor athletes are afraid of failure." On the contrary, the better the athlete, the more pressure is placed upon them. My team's last league championship meet saw our team needing the top three positions in the two mile to win the meet. When those runners toed the line, fear of failure was much more prominent than the hope of winning. We placed, first, second, and sixth. Had the pressure not been there, I suspect a first, second, third showing was in order. Fear, however, can promote us as well, if the emotion is reduced to the lesser severity of nervousness.

Nervousness will allow you to reap the benefits of an increased heart rate and respiratory rate. Nervousness will release epinephrine (Adrenaline) from your adrenal glands and will allow for dilation of vessels in the skeletal muscles, increased heart rate, dilation of the bronchi, and increases the level of glucose in the blood by stimulating the production of glucose from glycogen in the liver. Nervousness can enhance our senses, increase our speed, quicken our thinking, and promote faster running. Where nervousness tends to hurt us is when it is taken too far.

Everybody is nervous at the starting line. Many are afraid of losing. That's OK. It's natural. It's what makes you a competitive person. But when we take this fear too far, it begins to develop tenseness. We lose our relaxation, grow tight, and then fatigued. Fear taken too far may make us panic stricken, it may take away from our goals, it taints our perception of our perceived effort. We must therefore, learn to control, and indeed to utilize fear to our advantage. The athlete wants to be nervous when he stands on the line. He needs the physiological affects of that nervousness. He does not want to be afraid. So we can learn to control our fear, to minimize it into nervousness, and then to utilize that through visualization and affirmations.

Affirmations will serve to help reduce, and change the athlete's self-doubting behaviors. Through the use of affirmations before and during the competition, the athlete will greatly reduce tension, and increase his feelings of power and control over the situation. Visualization will help in that when we are afraid, we are mostly afraid of the unknown. Being afraid of the unknown is a helpless emotion. Once we know what to expect we are more apt to deal with it. When you watch a horror movie you are more afraid and feel powerless over the knife yielding maniac that you never see. We are afraid of what we don't know, who he is, what he looks like. As soon as we see the killer's face, we begin to yell "Hit him with the chair". We have seen the unknown and are prepared to deal with it the best we can.

In distance running it is the fear of how we will feel, who will show to the starting line, what the weather will be like, and most of all how we will do. By visualizing you take away some of the fear of the unknown. You have seen the competition, felt the weather, and seen the outcome of the race. You can no longer be afraid of the unknown for you have seen it. By knowing what to expect, you will be considerably less afraid, and you will help avoid the feelings of helplessness, and inadequacy. You will avoid the tightness that accompanies such emotions, and will run more fluently. You will take the strong word of fear, and reduce it to the considerably lesser intensity powerful emotion of nervousness.

With experience the runner will develop a sense of mastery over his race. For example, a long time miler may consider himself an expert, a master of the mile. He knows the pace to the second; he knows the standard tactics and strategies. He feels like he can beat faster runners using his knowledge of the race. Indeed he can. These feelings of control are productive to the runner. It is advisable to develop an affirmation along the lines of "I am a master marathon runner" or "I am in control of the race."

Fear of Success and Winning

"Becoming number one is easier than remaining number one" - Bill Bradley. It is not uncommon to athletes who sabotage their performance because they are afraid of success. As runners, we find it easy to grow used to knowing how to lose. We know how to pound the fist, shake the head, and use negative self-talk to convey the message to others, "I'm really upset that I didn't win". Sometimes these messages are a sub-conscious cover-up for not actually wanting to win or do well. Or a conscious cover up for not trying to win.

We can grow familiar to losing. We can even grow to like losing. We may enjoy the sympathy we derive from others. We may enjoy being able to cuss and carry on knowing it will be tolerated after a loss. Yet it may run deeper. We may lose, on purpose, because

we don't know how to act as a winner. Sure we know how to act as a loser, but a winner? As there is always fear of the unknown, there is unknown in winning. What do I do? What do I say? And the big one, "What is next?"

The fear of winning is not the fear of the win itself, but what that win might bring. As a high school miler, favored to win league, I did not win my league race, in fact I finished last. Why? I gave up because I was afraid of going on to the next step. I was afraid that I could not handle the increased pressure with the next step of competition. I was tired of the pressure. I had over-pressured myself, so I gave in. Pressures seem to rise in direct relation to the size of the emotional investment. Again these actions are rarely conscious, they are subconscious. It is not the race that causes the pressures it is your thinking about the race. Once again proving the power of visualizations, affirmations, positive self-talk, and goal setting for success.

Inner turmoil over the issue of success can be directly attributed to the fear of self-knowledge; we seem to resist recognizing our potential. After all, once you *know* you must *do*. Refusal to act could foster feelings of guilt about not developing your talents. Knowing you have the potential for success could lead to further commitment and hard work devoted to living up to that standard (Elliot, 1984, 128).

Often runners are afraid that if they are one of the scoring runners on their team, there will be increased pressure on them, and even the possibility for a team loss to be blamed on them. Nobody wants to be blamed for a team loss. By finishing as a sixth or seventh man (non scoring positions), one may be avoiding the pressures of being the top five scorers (I call these the danger zone). By not racing hard, or not showing up, you may save your face, initially. But in the long run, it is much more uncomfortable to avoid hard racing. Self-incrimination is inevitable, and your resulting nonsuccess will breed frustration and dissatisfaction. Eventually your avoidance may become habitual, according to Elliot.

The athlete with a fear of winning, like any other fear, is advised to face that fear through a process of desensitization. Through the use of visualization, affirmations, goal setting, and team support, this fear can be alleviated. Learning to win on a smaller scale might be the first step. Let the varsity runner drop down to win a JV race, or let him win a time trial. Like anything else, give the runner the chance to practice winning, just as we all too often are given the opportunity to practice losing. "By taking a few risks the athlete becomes accustomed to the ups and downs of success. It is important for them to learn to enjoy the competitive aspects of distance running. To start, begin by focusing on competing with yourself. Try for improvement in your time or position in a race" says Dr. Jerry Lynch.

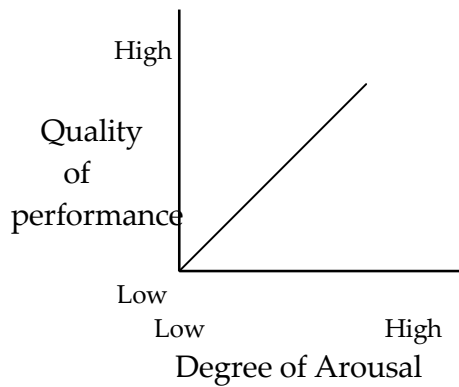
Another explanation for success-phobic behavior rests in the formation of one's reactions to parental demand for excellence during childhood. Even subtle pressure from adults to succeed can cause a child to form a resentful attitude toward sports as well as toward success in general. Thinking about becoming successful can conjure up bad memories of the childhood; of trying to please everyone else but yourself. *If there is a common theme underlying success-phobic behavior, it is this: We inhibit our potential in running because we fear the unknown.*" - Jerry Lynch.

Arousal and Performance

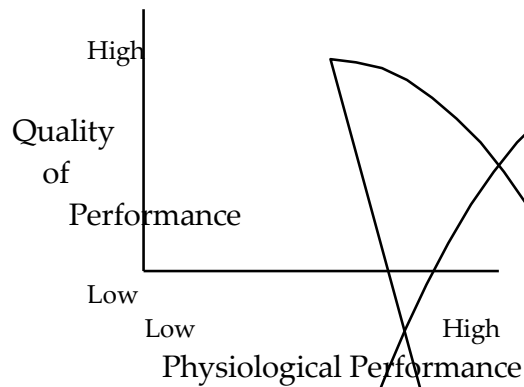
The relationship between arousal and athletic performance is one of the oldest fields in sport psychology literature. The term arousal typically refers to a physiological activation or autonomic reactivity. Landers has defined it as "the intensity level of behavior (1980, p. 77). We usually refer to physiological arousal as somatic arousal. Somatic arousal is not the only type. Recent literature contends that arousal has an emotional component as well. This is sometimes called cognitive arousal. Cognitive arousal can be of either a positive (excitation) or negative (anxiety) force. You may refer to these as stress and eustress, or pressure and excitation. Cognitive arousal may, or may not, correlate highly with physiological arousal (Anshel, 1990, 49).

You likely know what it is to be excited (positive cognitive arousal), but just what is anxiety (negative cognitive arousal)? Anxiety, in short, is a fear. Anxiety can be fear of a personal ego threat, physical danger, social evaluation, losing face, or simply a fear of the unknown. So when we discuss arousal we refer to pressure, anxiety, stress, and their opposites. It is difficult to separate the cognitive from the somatic arousal states in the runner; each undoubtedly affects the other. If it can be found that a predetermined level of somatic and cognitive arousal is predicting of successful performances than the study of arousal states would prove valuable to the coach and athlete. Indeed it has.

The first arousal theory was Hull's 1905 Drive Theory (figure a). He proposed that the probability of a successful performance was increased as the athletes somatic (physiological) arousal level was increased. We call this the Drive Theory. Hull theorized that performance was determined by the formula $P = D \times H$. That is Performance is equal to drive times habit strength. Today we recognize that habit strength is essential for a successful performance, but we no longer feel that the greater the drive the greater the performance - at least not for all sports. In fact, we recognize that the finer the motor task, the less physical and psychological arousal is required. The football lineman needs a great deal of arousal, the golfer does not (figure d).

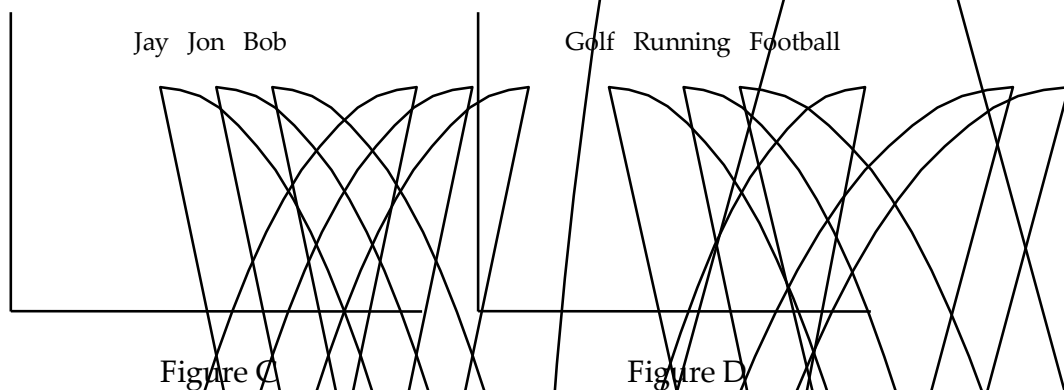


Drive Theory
Figure A



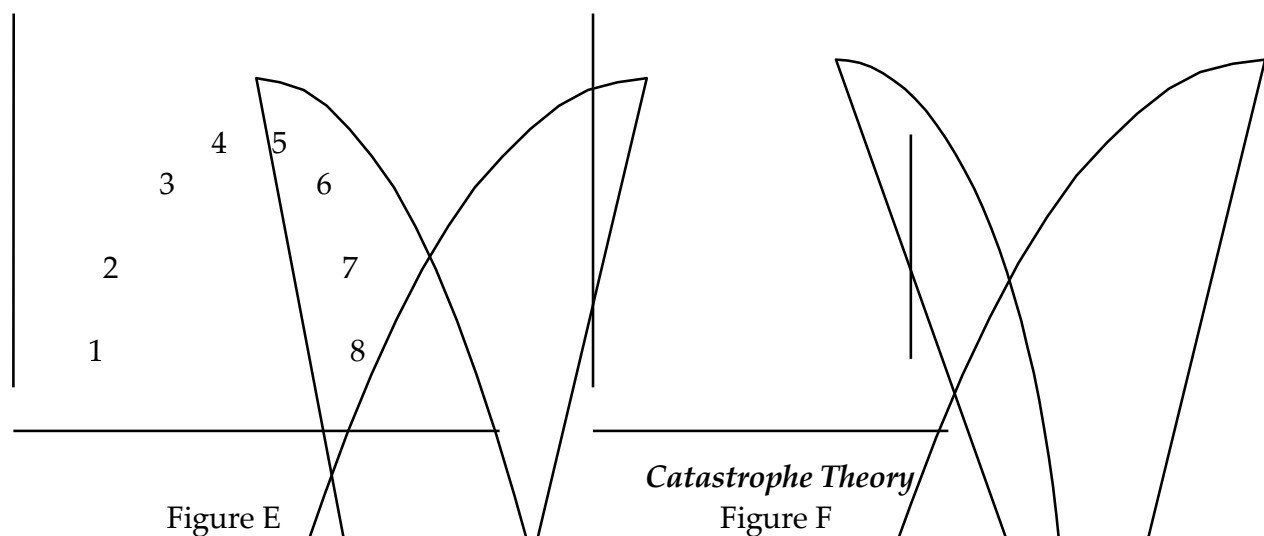
Inverted- U Hypothesis
Figure B

Recognizing the Drive Theories shortcomings, in 1908 Yerkes and Dodson proposed the inverted-U hypothesis. They suggested that heightened arousal enhanced performance to a certain point, after which continued increases in arousal will lead to a detriment to performance in a curvilinear manner. It was realized that each athlete has an optimal level of arousal in which they will perform their best (figure c) and that differing sports required differing levels of arousal (figure d). This hypothesis has received much approval in the sport psychology literature. I will now provide an example of the usefulness of this theory.



Look at the inverted-u below and follow with me in this example (figure e). You go out to run a time trial alone in which there is obviously no pressure- you fall at level one. Should your coach put you under the watch you may improve a bit and rise to level two. The coach then throws some teammates into the time trial and you rise to level three.

Now its a dual meet race and you rise to four. Perhaps the pressure in increased as you attend a low level invitational and you hit level 5. A big invitational may bring you to six, and a league championship seven, etc... These numbered levels are not part of the original hypothesis, they merely serve as an example of an increasing arousal level. This example shows why so many teams and individuals beat themselves in "the big race." They tell themselves that it *is* the big race. They add too much negative arousal - they over pressure themselves.



Studies indicate that many athletes do follow the predictions that the Inverted-U Hypothesis makes. However, many athletes find the Inverted-U Hypothesis only valid as pressure increases until the optimal level of arousal; after which performance drops off at a drastic rate - unlike that of the inverted-u hypothesis. For some athletes a small amount of over-arousal doesn't see a little decrement in performance, it sees a catastrophe - thus we call this the Catastrophe Theory (Thom, 1975). It is similar to the Inverted-U in that it predicts that performance will improve with increasing arousal to an optimal level; then the catastrophe theory holds that when an athlete goes over the top there will be a dramatic decline in performance. The catastrophe figure below graphically represents such a drop in performance.

Phenomenological observation of runners and teams throughout the years has enabled me to identify several situations in which a prediction of a poor performance is warranted. These incidents follow. First, the team does a yell or team chant before the race. This only serves the purpose of contributing to an over somatic arousal. Try to yell without tensing. Second, an athlete goes off to warm up by himself (away from the team). What he is likely doing is trying to "psych" himself up. He is likely to "psych" himself out! Third, an athlete has a mechanical looking jog/stride prior to the race as he passes in

front of competitors. What he is trying to do essentially is “look good”. Rather than being concerned with just warming up properly and running smoothly he wants to impress others; in such he adds pressure to himself. Fourth, the athlete loses all humor, and is “focused” too much on the race - again too much pressure. Finally, the runner is tight prior to the start. In such a case his cognitive arousal is so high that it has affected his somatic arousal.

Sport Psychologist Richard Elliot, in his book The Competitive Edge has developed five principles of arousal which I feel are important enough to borrow from his book. Incidentally, his book is available through *Track and Field News Press*.

1. Moderate arousal is necessary for optimal performance.
2. Relatively soon, however, as the arousal level increases, performance levels off and then begins to deteriorate rapidly. Because most sports contests invariably are going to increase arousal in the athlete, for all practical purposes, he normally will benefit by trying to lower his arousal level.
3. The more complex the task, the sooner performance will suffer as the level of arousal increases.
4. If the task is one that has already been well-learned and practiced, then normally a greater amount of arousal may be tolerated.
5. Within these parameters, each person reacts in his own unique way to stress. Some have a low tolerance for stress, some high. Each has his own arousal level at which he will perform best.

Arousal Control

“You have to learn to pace yourself... Pressure... You’re just like everybody else... Pressure. You’ve only had to run so far, so good. But you will come to a place... Where the only thing you feel are loaded guns in your face. And you’ll have to deal with pressure...!” - Billy Joel. Learning to control our state of arousal then proves to be a beneficial attribute for the runner. We can learn to decrease our state of physical arousal by using the cue word “relax” from our visualization sessions. When we say this word to ourselves, since we have practiced it, we will instantly feel a surge of relaxation flow through our body. In fact I practice this in visualization by telling my runners that “When I come by and touch you on the shoulder, you will feel a surge of relaxation rush through your body.” Then when the runner is lined up before the race, I need only to come up to him and touch him on the shoulders

and say, “relax” to elicit the response. Affirmations too help lower an athlete's level of arousal. Affirmations such as “I am loose and relaxed” or “with confidence I will control the race”. These sayings will help convince the mind that it is relaxed, and in turn the body will follow.

Rarely do I find it necessary to increase a runner's arousal prior to a race. However, if I decide to do so; one method is to place stress on the athlete. I recall telling one of my Sophomore runners, whom had already placed third in the mile league finals and feeling quite content to leave the meet on that note, that the team absolutely needed him to finish second behind our other two-miler for the team two win. The game worked. Another time I purposely upset a runner by telling him he was slow and I was going to replace him with another, faster, runner. Or a runner can clench his fists, then relax, clench, relax.

In general the athlete will put enough pressure on himself to excel. Like fear, too much pressure (negative cognitive arousal) may add up to a choke for a race. Parents, coaches, spouses, and friends are best advised to lay off the pressure. Sayings like “It's the last race” or “You have got to beat him” add undue pressure that may cause the runner to relive it by bombing. Most runner's put enough pressure on themselves without outside help.

Coaches are generally experienced and knowledgeable at dealing with pressure. Good coaches know that the last minute pep talk may work for lesser experienced athletes, but for the advanced competitor, approaching the race as just another day at the office is the best approach. Parents are the worst culprits at causing high school and college runners to bomb. Parents, out of good interest, place undue pressures on their kids. Parents are well advised to avoid their kids entirely before a race. Simply watch with the other parents from the sidelines. Chances are your kid does not want you acting as his coach before the race, or at any time for that matter. Parents are also advised to allow plenty of time after a poor performance, just like a coach, before talking to their kid (See Five Stages of Loss).

For runners with chronic bombing habits the coach the athlete may need to seek the help of a qualified Sport Psychologist (Ph.D.) or Sport Psychology Consultant (M.A.). He will use a variety of techniques (including therapy) to teach the runner how to deal with and alleviate pressure. He may have the runner undergo a process of desensitization, use visualization, affirmations, therapy, role playing, self talk, or use other methods.

I once had a runner who was so nervous before races he would continually throw up. He (against my advice) was taking an anti-emetic, to help with these feelings. This is a behavior that warrants professional help.

Anger

Like fear, and pressure, anger can either be utilized by the athlete or it can be used against him. To be angry is to increase your autonomic nervous system, in short it gets you going. The inherent danger is, once again, becoming physically tight. It is acceptable to be mentally angered, not physically. You can channel these energies into running faster, hatred carries a lot of power. However, if you let these emotions over-ride you, tenseness will occur along with the loss of concentration. You will then find yourself an uptight, tight, slow runner.

It generally does not work to try to anger yourself as a purposeful ploy. However, should an angered situation arise during a race you may channel your efforts into faster running. The problem arises in how to control your anger once you do feel it. We often give up our personal power and integrity when we grow angered. To practice dealing with anger during competition visualization is valuable. See yourself competing and then having something happen to you. Feel yourself grow angered, and then turn that anger into an increased, loose, relaxed, pace. I do not recommend actually visualizing any individual in particular, for this will affect the way you perceive the individual in reality; use blue people as an example. Lastly, for those whom have had previous problems with anger during competition, I recommend the development of affirmations. The affirmation should see yourself accept the anger, but choose not to react to it. Perhaps, "I let go of anger and think of the task at hand" or "Anger makes me run fluently."

The Five Stages of Loss

"Success is never final and failure is never fatal." It is important to acknowledge and mourn your losses, have your feelings, and accept them. "You then go on with life-- learning from your experiences, letting go of your losses, and healing your pain", says Kay Porter. Sometimes the outcome of a race is not always within your control. Sometimes we simply do not have what it takes physically to do what we desired mentally. How do you let go of a goal after having it for months or years. "Yes you must dream; yes, you must follow your visions; and, if after years of hard work your ultimate dreams have eluded you, you simply let go, acknowledge your achievements, take pride in them, and go on with life, continuing to set new goals, and seek out new pathways", says Porter.

Athletes should be encouraged to mourn their major losses. Although some may actually see their loss as a relief from the pressures, a serious loss will take on the same emotional stages of a death. It is crucial to understand the five stages of loss, to let them happen. For only in their completion can the runner go on to set new goals, dreams, and

live life with vigor again. These five stages of loss (or death) are: 1) Denial, 2) Anger, 3) Bargaining, 4) Depression 5) and finally acceptance.

1. DENIAL

"I can't believe I lost..." "I can't believe this is happening to me..." "So many years of training; how could I lose?" These are the initial impressions of a runner after a substantial loss. They tend to be short in nature, seconds to minutes. Yet depending on the severity of the loss, this stage can last for days, months, even years for some. Often this stage is marked by the runner acting dazed, almost like he is in a coma.

The denial stage is important to pass through without being denied the right to. Let the athlete pass, simply put your hand on his shoulder. No words are probably better than words. The denial stage may serve as a self protection mechanism as well. For example: If the runner bombs one race, and then goes into denial, and has another race that evening, denial may protect him so that he can perform his best in the upcoming race.

2. ANGER

"I should have...!" " Why didn't I....!" " Damn him he....!" "Thanks for the great advice, coach!" "Stay away from me, it's your fault....!" Anger is the next stage the athlete will pass through. This stage tends to last longer than the denial stage. I recall watching my top two miler get pushed off the track to an injured fall during his league finals. As the runner who pushed him made way around the track my runner went through denial in about 200 meters, just waiting there, sitting, almost in a trance. I knew what was coming next. Anger! I bolted down from the stand, jumped, and tripped over a fence, and made my way to subdue this runner just in time to meet stage two. "I'm going to kick his ass...etc...!"

When an athlete goes through the anger stage he may take his anger out on himself, yelling at himself, calling himself names. Or he may take it out on a competitor or an opposing team in general. Or, as coaches are well aware, he may take it out on the coach. For this reason, I highly recommend that a coach avoid any vocal comments to a runner until after he has emerged from not only stage one, but two and three as well. If the coach approaches the athlete in the anger stage especially, he is making himself accessible to be the blame. The coach is likely to, and understandably, be upset with the athlete, and to let him know so. After the athlete has passed out of the anger mode, made it through the bargaining stage, and into depression he is likely to be depressed over two things, the loss and having lost his trust, friendship or face within his coach. I strongly recommend that coaches do nothing more than put their hands on their defeated athlete's

shoulders, if that, until you see the athlete morning. Once you see the morning (stage 4), it is the time when the coach can actually improve his bond between himself and his runner by showing that he cares, by simply being there for him. Coaches are advised to tell the runners at the beginning of the season that they will avoid anyone who has had a bad race. This prevents the athletes from blaming the coaches for "not being there for them".

3. BARGAINING

"Please God...." *"If I could just have another chance...."* These are the words of the bargaining stage of loss, stage three. Generally, the bargaining stage does not last long. Minutes at most. Often it is only one sequence. This stage makes way for the painful one. That of depression.

4. DEPRESSION

"All I wanted was...." *"It's not fair...."* *"I have worked so hard..."* *"Why me?"* Crying is the earmark of this stage. Shaking of the head, covering the face, finding a secluded spot, are also signs. We are all familiar with the miserable feelings associated with this stage. We have all been there, and we should sympathize and support anybody in such a stage. This stage lasts the longest, sometimes years.

It is important to mourn a loss, for if we do not mourn, we do not fully recover. It may be important for an athlete to delay his mourning until a better time. For example, it is far better to delay the loss of one race, if you are racing again several hours later. If this is the case, the coach may help delay this loss by approaching the athlete and saying, *"Listen, (put both hands on his shoulders and make him look at you) it is OK for you to feel this loss, but not now! You still have another race ahead of you. We will worry about what happened in that race later. Go warm up for the next race just like you have done thousands of times in the past. Think about your strategy, where are you going to make your moves? (Await an answer). What pace are you going to take it out in? (Await an answer). Be sure you're well warmed up, and ready to go. OK? OK? Look me in the eye and say OK. Good, now go over there and run your warm up with your teammates, don't speak of your loss, it's not fair to them either. And Dave, you're all right!"* It is possible that the athlete will do well enough in this next race to actually take much of the pain away. It is also possible that the athlete will bomb, making things worse. That is athletics. That is the difference between a competitor and a runner. You must get out there and do your best and be responsible for your wins and losses!

5. ACCEPTANCE

The final stage to the five stages of loss, is that of acceptance. In time, acceptance will always come. The depression stage may last: for minutes, hours, days, or sometimes

months to years; but eventually, the acceptance stage will come. Without truly going through the emotions of the last four stages, unhindered, and feeling their emotions, acceptance will be far delayed and of a lesser degree. For with true acceptance comes not only the ability to look forward to your next race, season, or goal, but growth as well. This growth is the reason for athletics, for without it, competing would be a huge risk with little payoff and much loss.

Unfortunately, sometimes, the depression stage of loss becomes too withdrawn; too severe. It can, on occasion, lead to serious bouts of depression and even suicide. For more on this read on. *"If we hide or deny our feelings, they're with us forever. It's only by letting them go that we can be truly free. And it's only by experiencing them that we can let them go."* - Kay Porter Ph.D., and Judy Foster

Depression and Suicide

"Victory has a hundred fathers and defeat is an orphan." - John F. Kennedy. Why am I talking about such psychological issues in a book devoted to running? Because they are as much a part of running as they are a part of life. Loss can and does frequently lead to serious depression that can ultimately lead to suicide. There are approximately 6,000 suicides in the age bracket of 15-24 per year in the United States. There are over 500,000 suicidal attempts. These ages 15-24 are the high school and college ages. They are the ages in which the future is not easy to see. In which a loss is not compared to the macro-spectrum of life. In which a loss can mean everything.

Perhaps you have heard the story of Kathy Ormsby who left her 10,000 meter N.C.A.A. championship race in the middle and jumped off a bridge in a suicide attempt. Today she is paralyzed (Williams, 1986, 76). These things do happen and this was not an isolated case. The year earlier, in a much less publicized incident, a Villa runner attempted the same thing. We need to look for them, and know what to do if we suspect suicide.

Depression is the earmark of suicide. Suicide is a vicious cycle that spins downward, adding onto the existing depression. The depressed individual has blinders on, he sees nothing but his depression, which adds more depression. He sees no other option, he feels no hope! There is hope, he is just too depressed to see it. He feels alone, powerless and hopeless.

Athletes who base their whole value system on their athletic prowess are even more prone to suicide. For when they "fail" at their only pillar of self-esteem, they feel useless, unimportant, often suicidal. It is important to realize that our subconscious does not want to die! It will try to save you. The suicidal person will act in different ways,

crying out for help with both vocal and silent cries. If the conscious mind tries to do it the subconscious mind will try to sabotage it. The cries for help must be heard, the signs must be detected!

If you suspect suicide ask the person in concern! There exists a deadly myth about suicide that goes something like, "suicidal people won't talk about it," if they do they are just doing it for attention. NO! NO! NO! Suicidal people will talk about it, they are trying to through their words and actions. Ask! Ask if they are feeling suicidal. Even if someone is doing it just for attention, can you take that risk? Are you willing to ignore someone's cry for help, and take the chance of losing them?

It should be noted that 90% of all suicide attempts are made by girls, while 70% of all completions are made by boys. Boys tend to choose more lethal methods. For anybody, anybody, two days of depression warrants help. You can call your community clinic for psychological care, a local hospital such as Charter or College, or 911* if it is available in your area. Or try a suicidal hot line. If you are feeling suicidal, there is hope, this too will pass. Ask for help.

* The use of 911 is not always affective. The police do have the power to take someone in for 48 hours mandatory observance, but they often do not react to suicidal calls.

Suicide Warning Signs

Actions

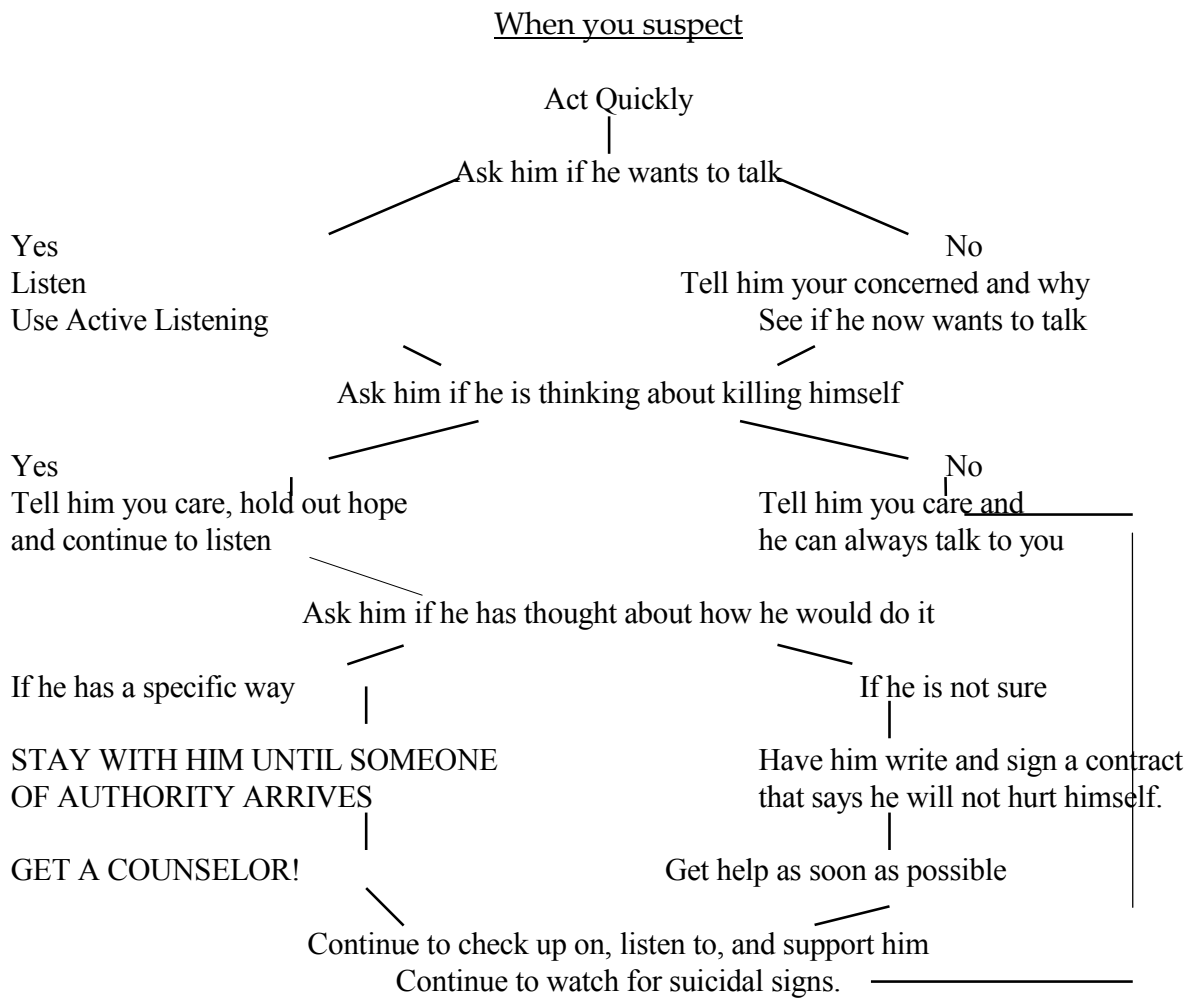
Giving away of possessions (living will)
Loss of interest in hobbies
Withdrawal from family & friends
Extreme behavior changes
Impulsivity & Lying
Reckless behavior (chance suicide)
Drug & alcohol use or increased use
Self mutilation
Neglect of hygiene (doesn't bathe)
Breaking off of relations for no reason
Change of or loss of sexual interest
Disturbed or not sleeping
Change of or loss of appetite
Physical health complaints
Fascination with death
Reading of poetry of death/suicide
Idealizing those who have committed suicide
Change of musical tastes

Feelings

Depression
Hopeless
Powerless
Guilty
Worthless
Hostility
Sadness
Despondent
Lonely

Words

"I wish I were dead"
"I can't take it anymore"
"I can't think straight"
"Have you ever though of killing yourself?"
"Maybe I'll just kill myself"
"What would you do if I killed myself?"
"I don't care anymore"
just don't know what to do"



P.R.itis

P.R.itis is a name I have given to a particular mind set in which the runner enters each and every race looking for a personal record. Racing has much more to offer. A runner is better off to enter a race with intentions of running the best race he can, for that day, under those circumstances. The top flight runner's first concern should probably be placing first, or perhaps doing as well as he can for his team on that day. Attempting to PR each and every race is a self-destructive attitude. When an athlete enters a race with the only goal of being to run a personal record chances are that he is setting himself up for a fall. Besides most coaches believe that the way to a personal record is to concentrate on place, not time.

I advise runners to extract as much from a race as they can. Run the smart strategy for that day, under those circumstances. Some races may be run easier than others.

Sometimes you may sacrifice a time, for a better strategy that will give you a better chance to win the race or place well. Many runners enter the race with PR in mind and find when they do not hit their split(s) on time, they give up. "I can't PR now" and they slow. You are far better off to enter the race with intentions of racing your best, attempting the best strategy and tactics possible, beating as many of your competitors as possible, and pushing as hard as you can. This will optimize your chances of success. If, by chance, you happen to set a personal record then congratulations - it is an extra, well-deserved, bonus.

Watch-A-Holic

A watch-a-holic is simply a name that I have given to individuals who are overly concerned with time. Whether it be in a workout or a race. You know the type, they are the ones who must be sure that their quarter mile repeats off the track are exactly a quarter mile, so that their times are absolutely correct. Who cares? Running is what is doing you the good. The watch can be a very useful tool, as you will see in the next chapter. However, your time should rarely be a source of stress. It is more important to look at how you ran the race or the workout than the time. The watch-a-holic runs a difficult or hilly course, and is still concerned with time. There are simply some races in which time means nothing.

The All or Nothing Attitude

The "all or nothing" attitude is one in which the athlete feels that if he is not going to be the best on his team, or first in the race, then he would just assume drop out, or at least drop back. This athlete is typically found in a runner who is often competitive with another on his team. In other words, the team's second best runner often displays this attitude. Matters are particularly confounded if he used to be the team's number one runner. Often what happens is that this runner is more concerned with beating his own teammate than how the team does as a whole. He is likely to go out hard, in attempt to beat his teammate. When the teammate catches, or he realizes that he is not going to beat his teammate, he drops out or back. In cross country what I usually what I find is that he drops out of the "danger zone" which is the top five runners (being they score). Usually this number two runner will drop all the way back to sixth or seventh. This way he doesn't think he can take blame for the performance. After the race he will likely act in one of two predictable ways. He will either have made some excuse (injury, pain, or sometimes even falling in the race on purpose) or he will just act so "pissed off" in attempt to prevent the coach or teammates from saying anything to him. It works too. We usually won't tell a runner he blew it for the team when he is really mad.

Dealing with such an attitude is no easy task. The coach must remember that the athlete doesn't care much about the team. He cares about being number one on his team. Knowing such the coach usually needs to approach the athlete in a manner that deals with such. For example, tell the runner that you believe he can be number one if he just hangs on to the back of his teammate and then outkicks him. Or you may need to try a little reality therapy. "Look #2 your not #1 anymore so why don't you just try to be the damn best #2 you can! Never condone this behavior by doing nothing. You only make the problem worse. Also be mindful of the parents role in this runners case. Usually you will find overly pushy parents behind the runner who too care only that the kid is number one on the team.

Dedication and Motivation

There is a substantial difference between dedication and motivation. Dedication lasts a season, career, or life. Motivation is high in intensity, yet short in duration. Many runners find themselves easily motivated. You know the type, perhaps you're one of them - they run a good race, or see an inspiring movie, and they are off training hard three times a day. This motivation does not and will not last. To be truly successful you must be dedicated.

Dedication sees the runner training in all weather conditions. Dedication sees the runner training when he doesn't feel good. Dedication allows the runner to always make time for his run. Dedication sees the runner studying his sport. Dedication allows for rest when required. Dedication sees a seasonal peak as just one step in the whole scheme of things. Dedication (and heredity), are what make Olympians. Certainly dedication is what will make you the best runner you can be.

UTILIZING VALUABLE ASSETS

There are many valuable assets a runner can use to help him train and race better. This chapter discusses the use of such aids.

The Coach

There is no tool as valuable to the distance runner as the coach. The coach is the entity that allows the runner to grow as both a runner, and more importantly, as an individual. Coaches are given the task of instilling wisdom and dignity into their athletes. The coach serves a multi-faceted role. Indeed they vary in interests, methods, and styles. They are unique in approach, yet all share a common interest - their love for the sport of running and the hobby of coaching. It is important for the coach and athlete to establish a relationship based of mutual respect and consideration. To do so the coach must establish himself as a jack of all trades: by turns a strict taskmaster, a cajoling humorist, a trusted confidant, or a persuasive orator. But first, and foremost, the coach must educate his runners. "The best coaches have always considered themselves teachers above all else" - Merreil Noden. The athlete too is responsible for the relationship. He must communicate effectively his desires, concerns and gratitude.

Under these circumstances, the runner is provided the opportunity to tap into a resource that is experienced and is versed in the methodologies of the sport and a resource that will share their enthusiasm for running. While it is always beneficial for the athlete to study his sport (and highly recommended) the coach often studies it in a different perspective. The athlete tends to study the sport with one thing in mind, "How can I be faster?" The coach tends to study the sport in a different mind set, "How can I help these runners be better people, capable of leading healthy lifestyles, and increase their love of running, and their abilities?" The runner tends to look at his training as a step to the league finals the next season. The coach looks at seasonal training as just a fraction in training for bigger goals, indeed for life. Let us look at the value of the coach in individual spectrums. Hopefully, I will be able to sell you on finding yourself a coach if you do not already have one.

Obviously a coach can help you with the scientific attributes of your training program. However, assigning workouts is not the difficult part of coaching. This is simply a matter of following a few basic principles of physical training (see Chapters Two and Three). You see, a well crafted interval session is of little value if the athlete's level of motivation is insufficient to carry it out properly and with effort. This is where the art of

coaching comes in to play. One of the coach's challenges is in developing training runs that not only meet your physical needs, but your psychological ones as well. Variety is often the key. Being human beings are marvelous creatures at adapting to situations and it is easy for the runner to grow bored with the same routine. Therefore, the coach should make the workout exciting and different (see Chapter Five).

Still there is more to coaching than assigning proper and diverse workouts. The coach can see things in your training that you often are not able to see. The coach has an objectivity that allows him to see the flush in your skin, the fluency of your stride, the determination in your eyes. He can determine when you need to do more and when to do less. It is not always possible for the runner who is experiencing a plateau in performance to determine whether more or less training is required - the coach can. It is not possible for the runner to see everything that transpires in a race or meet, again the coach can.

More importantly, the coach provides the athlete with an array of psychological care. A simple pat on the back improves your self-esteem. Conducting visualization, team talks, or individual counseling will help you to be a better runner and person. The coach may serve as an instrument of dedication. Not to be confused with motivation (see Chapter Ten), dedication is extended commitment. Through his own actions and words the coach can teach morals, values, and sporting ethics. The coach often becomes a member of the family, or is looked at as an older brother or sister. Often the coach becomes a parent figure, or a best friend.

The coach serves as a teacher, teaching you the specifics of the sport. He may serve as a counselor, or is just be there to listen. He acts as a friend: supporting encouraging, and cheering. He acts as a parental figure, demanding that you do something when you don't want to. He can teach you, inspire you, counsel you, love you, listen to you, push you, protect you, plan with you, deal with bureaucracy for you, have contacts for you, evaluate competition for you, yell for you, congratulate you, guide you, care for you, and for some he may always be a part of you. In short he cares for you and your progress. Have I sold you yet? I hope so. For there is a good chance that if you have purchased this book; you may not have a coach. I advise you to get one if you are at all serious about your running.

If you do not have a coach, find one. Look to the local high school, community college coach, running shoe store, friends, or ask the local elite runners in your area. If you cannot find someone willing to coach you find a training partner or other reasonable facsimile; somebody who can look at you and your training from afar. If you already have one, I wish to teach you how to utilize your coach to maximize your potential and achieve your goals.

The first step is to listen to your coach. LISTEN to what he has to say, and process the information. Remember that you are trying to learn, not just be a puppet. Of course you're not going to blindly follow; but after you have built trust in your coach be willing to follow his plan. Sometimes this requires trust. I had a freshman runner in our County Championship Meet once to whom I gave a race strategy. He did not think it best; after the mile mark in 30th place, he thought "No this can't be right." But nonetheless, he followed my plan. He moved up as planned and eventually won the race. He trusted me completely. You must realize that there are many ways of achieving the same goal. There is no winning schedule, no perfect pattern to follow. If there were, there would be no need for coaches (plus I'd patent it and be rich). The coach's job is to help you as an individual and to help the team as well. So put your trust in him.

So we now know that in order to obtain as much as possible from your coach, you must both listen to and have trust in him. What else can you do? You can talk to your coach - honestly. Runners often lie to their coaches. Reporting to feel "fine" when they don't. Saying they don't mind running such a race, when they do. Athletes need to be honest with their coaches. For only in knowing what you truly feel, and desire, is a coach able to optimize his coaching for you. Honesty, however, is something that needs to be approached with delicacy sometimes. If you are upset with your coach, which you are bound to be from time to time, you need to tell him so, in an appropriate manner. This often means waiting until you are in private. It may also mean waiting until the coach is not busy. Find the ideal time, approach him calmly, and talk. I am reminded of a particular incident in which a coach friend of mine was approached the first 15 minutes of the season's end banquet; the parents laid into the coach serving no purpose than upsetting him in a time in which he should have been free of stress to do his job and praise his runners.

To further utilize your coach - inquire. Too often runners expect to be told, and do not ask. Coaching is not like sitting in a school lecture hall, in which it is the teachers job to present information, and the student's job is to learn it. In coaching, it is the runner's job to seek out any and all information that will help him achieve his goals. Chances are, your coach is full of valuable information. It is not easy to disperse this information, the coach often doesn't know where to start or what is desired. It is much the same as a computer. You can't say to the computer, "Tell me everything." It can't do that. But if you specify "retrieve:\running\workouts" it will give you that information. Ask your coach for specifics. "Coach what could I do to prevent him from out-kicking me?" Notice I said, "inquire" at the beginning of this paragraph, and not "question." For the word question is often used as in the word questioning; such as questioning whether the coach was right or wrong! Don't question - inquire.

You can also talk to your coach about things other than running. The better the coach knows your individual personality, temperament, background, etc.. the better he will be able to coach you. I know my runners well. I know them as individuals. I do so by hosting team dinners, taking them on far away runs, camping, traveling to weekend (non-school) races, or simply stopping off for dinner after a run. By doing so, I learn to understand my runners' temperaments, what motivates them, and what doesn't. By the time a big race comes around I can better understand and help them. For example, I recall one runner who had been struggling with what I call "senior tendonitis", and missed much of his training. That night, he was reduced to tears. He was upset that he had slacked off all season long, and feared the outcome of his last race, and more importantly feared the reactions his parents would have to it. Knowing his temperament, I knew what to say to him, "Don't do it for me. Don't do it for your parents. Just go run the best you can for yourself." I could have said, "The team needs the points" but I knew this approach would not work for he did not care about his team.

Finally remember that a coach is human and you are human, thus, as a coach and runner, you have a relationship. This relationship follows much the same lines as all relationships do. Therefore, it is recommended that you follow the Golden Rule. When you have a problem with your coach, talk to him about it. Refrain from shooting your mouth off. Thank your coach when he does something for you. Treat your coach with respect. Show your appreciation. Use common courtesy. *"Any coach who claims to possess the secret probably shouldn't be trusted. There aren't any secrets to this business"* -Harry Wilson.

The Measure of Your Miles: The Log Book

If there were a fire in my home the first thing I would grab would be my running log (Ok maybe my dog first). For this log is irreplaceable. Its pages are filled with information about me. I laugh as I read my beginning days, what I thought was fast, what I thought was heart breaking. I cry at memories of past friends, and dreams that were never realized. Always in the back of my mind is that while I'm reading the pages of this months workouts and have no emotion, some day I will look back at this page with the same emotions as I look back to the others now. As nostalgia this book is indispensable. It contains all the times I ran, all the awards I won, all the friends I had, all the pain I endured. Without having kept this daily log, I would have long forgotten old times, races, friends, and who I was. The log is priceless! And besides, it solves those "remember when" arguments.

Beyond the sheer beauty of the log's nostalgia, it also serves as a tool to help you be a better runner. By logging your daily workouts, your weekly, monthly, and yearly mileage, you can help determine which form of training pyramid has worked best for you (see Chapter Three). You can determine what the best workouts were for you for a particular distance. You can determine how much tapering worked best. Careful analysis of your logbook throughout the years can serve as the most technical tool in developing a workout schedule.

By listing under an "other" category, you can keep track of minor pains, and delay the possibility of an injury through early detection. Without the log we tend to forget the little pain we had a few days ago. Taking note of a "little right knee pain" over a few workouts will tell you to take a few days off now, before you are forced to take a few weeks off later. You may also see what form of training led to the most injuries of your career by analyzing your workouts and injuries. You can also chart how many miles you have on each pair of shoes.

Keeping a section in the back of your log book to track (or chart) personal record progress, proves an interesting venture. Seeing your progress helps to keep you motivated. You can look back and say, "Hey look at this three year period without a personal record, and I never thought I'd PR again. Then I did, and I will again."

If you race the same course, or distance continuously, you may easily determine which strategy works best for you. You may discover that your best 10K times came from racing a particular strategy. Discussing the tactics you utilized in your race will help you remember them, so you may choose to utilize them again. You may note how one of your competitors used a particular strategy, or a location on the course where he was particularly weak, and you can have an advantage on him the next time you race.

You may also determine what mind set works best for you. Analysis of the last ten years of my races shows that 90% of my personal records were achieved when there was little, or no pressure on me. In fact, many of my personal records were set when I had no intentions of racing at all, and consequently felt no pressure. Several races are described as "felt good so kept picking it up" which might point toward this as an ideal strategy for my particular racing style. The log may also help you determine what diet works best for you. "Regurgitated after race" may clue you in to realize that that food wasn't the best choice to eat before a race.

Keeping track of your mileage on a weekly or monthly basis will help you increase your training in small increments, so as to avoid injuries - though I personally choose not to record weekly mileage since it puts too much pressure on me and sometimes pushes

me to overtrain. Also, tracking your monthly and yearly mileage provides you with the opportunity to develop some truly personal records. Statistics junkies can find as many stats to keep log of as a baseball statistician. "Fastest 10K with a starting time of 9:00 in the fall" type of stats. These types of personal records may provide for an additional boost to your sense of self. Personally, I am more fond of my 10,000 mile shirt, than of my first marathon shirt (in which my team ran with me and then signed). The log book also serves as an excellent place to write down your goals. Every time you log a run you are reminded as to the reason you did it; as the goal is staring you in the face. It is also a great place to keep affirmations, track of the mileage on your shoes, etc... The log book should be a living entity, continually evolving. It is more than just a record of the past, it is a synthesis of the past and present to enhance your future.

Creating a log is a personal matter. You will probably grow to love whatever form of log you create. Yet there are some recommendations that will make logging, and reviewing easier. By chance I developed a log that I believe to be aesthetically pleasing, but one that allows for easy reference to years past.

Standard log books, made for the sole purpose of running, generally offer large spaces to write down your emotions, or extreme detail of the workout. I do not favor this type of log. The problem is that it takes forever to find a run or race you did years ago. Additionally, room for workouts is not that important, you desire to read about races more. For that reason I recommend buying an accounting ledger, with horizontal lines only. Mine is 9 5/8 inches by 6 1/4. My recommendations are these:

1. Find one with approximately 30 horizontal lines: this will enable you to scan roughly one month at a time.
2. With the book open, log your workouts on the right side of the binder, and the back of the other (left of binder) leave blank.
3. Create 7 vertical lines through the page of appropriate width for the following information:

Date: of the run

Type: "W" for workout "R" for race "T" for time trial

Miles: "A" for approximate-A10 equals approximately 10 miles

leave as just 10 if you know the distance to be true

Time: or put a - for unknown

Value: optional read on for more information

Location: where you ran

Other: whom with, weather, etc..

4. You leave the left side of the binder blank. This blank side is the perfect place to write goals, affirmations, and to write about your races. To write about a race I would list the race on the right side, as mentioned above, and then put in the "other" column, SEE #1. Then you would go to the left side of the binder to read #1. This form of log proves ideal to find information rapidly. I can find any race within the last 10 years

within two minutes. In addition, it allows plenty of room to write reflections on races, seasons, etc. It is also an ideal place to write the date you bought your shoes on.

5. Leave several pages in the back for: Monthly mileage, Yearly mileage, Personal Records

I believe the above mentioned columns to be self explanatory, with exception to the “value” column. This column is developed to give you a sense of quality put into the workout. It allows you to judge your training off “quality points” as well as miles. We all know a 5 mile tempo run to be of considerable more difficulty than a 10 mile LSD run. The following system will help give some sense of value to these runs. You can therefore add to your personal records, most points scored per month or year. Simply take the time of your run, and divide it by the miles run. Derive your miles per minute pace from this. Then take that pace and check the chart below to determine how many points that pace is worth. Then multiply that point value times the number of miles run. The system is quite simple, and it helps to give credibility to low mileage, higher intensity workout schedules.

4:00 = 20000	5:00 = 5000	6:00 = 1250	7:00 = 313	8:00 = 79	9:00 = 20
4:05 = 18333	5:05 = 4583	6:05 = 1146	7:05 = 287	8:05 = 73	9:05 = 18
4:10 = 16667	5:10 = 4167	6:10 = 1042	7:10 = 261	8:10 = 66	9:10 = 17
4:15 = 15000	5:15 = 3750	6:15 = 938	7:15 = 235	8:15 = 59	9:15 = 15
4:20 = 13334	5:20 = 3334	6:20 = 834	7:20 = 209	8:20 = 53	9:20 = 14
4:25 = 11667	5:25 = 2917	6:25 = 729	7:25 = 183	8:25 = 47	9:25 = 12
4:30 = 10000	5:30 = 2500	6:30 = 625	7:30 = 157	8:30 = 40	9:30 = 10
4:35 = 9166	5:35 = 2291	6:35 = 573	7:35 = 144	8:35 = 36	9:35 = 09
4:40 = 8333	5:40 = 2083	6:40 = 521	7:40 = 131	8:40 = 33	9:40 = 07
4:45 = 7499	5:45 = 1886	6:45 = 469	7:45 = 118	8:45 = 32	9:45 = 05
4:50 = 6666	5:50 = 1666	6:50 = 417	7:50 = 105	8:50 = 26	9:50 = 03
4:55 = 5833	5:55 = 1458	6:55 = 365	7:55 = 92	8:55 = 23	9:55 = 02

If your minutes per mile pace falls in the middle of one of these give yourself the benefit of the doubt, and take the higher point value. If you desire, you could also develop a point value dependent on your fastest mile, with the time of your fastest mile being worth x amount of points, and declining from then. It is important to know that this system is not perfect. That is why it is optional. It is impossible to determine a mathematical system that relates to muscular effort. This is simply the best system I could develop. It would be possible to just list you miles multiplied by a perceived effort of 1-10 (1 being a walk and 10 being race pace). This method might prove to be easier as well.

It is important to log your runs each evening. That way you will acquire the habit of doing so. I also recommend logging your races, as soon as possible. You may wish to

discuss in your log race related information: date, name of race, distance, location, time, weather, duration of warm up, goals going into, strategy going into, splits, strategy utilized, tactics utilized, competitors and their strategies and weaknesses, shoes worn, the tough part of the race and how you dealt with it, and your pre-race diet.

Do not become a slave to your log book. It can become easy to push yourself when you don't feel like running. You shouldn't run simply because you wanted to do X number of miles for the week, or you wanted to run every day. You type A personalities are especially prone to becoming enslaved to the log. It is far more important to read your body than your log. There is a sample log at the end of this chapter.

“My diary has taught me almost all I know of running...It showed me what I ran, how to run better, how to think about what I'd run...So much of what runners do is invisible, gone behind us as soon as we pick up our feet, that we need this reminder of where we've been and what we did there...The trick in turning your history into a better future is learning to read that trail. Where on it did you move easily and quickly. What wrong turns did you take?” - Joe Henderson

The Progress Chart

The progress chart allows you to see your seasonal performances logged on a chart. Three lines represent: your current performances, goal performances, and the previous seasons performances. This chart enables you to see improvement. It also helps break up your three seasonal goals into smaller, manageable increments.

It should be recognized that progress along the exact goal line is not going to be, nor should it be, precise. Improvement is always two steps forward, one step back. It is unrealistic to expect to follow your goal line throughout the duration of the season. The goal line simply serves as a rough indicator of about where you want to be at that point in the season.

The left hand side of the progress chart sees your increments of time. Fill out the times from the slowest you could possibly run to your dream goal. Leave a few spaces above your dream goal, just in case. Simply divide the number of spaces available by how long you want your time span to be and make the increments as small as possible. Make sure you take into account last seasons times as well as this seasons predicted times. I recommend using a time column that will allow you to see large drops in time graphically. So for the half mile design a time line of quarter or tenths of seconds.

The middle of the chart sees the places for the names of your races on the angled line, and the date on the horizontal line. You may choose to write in the names of last

years races on the angled lines as well, use a different pen color. See the sample progress chart in the back of the chapter as an example. There is also a bland chart for you to photocopy.

Sleep

"I don't regret a single race that I missed because I wanted to sleep in" - Matt Fulvio. In a recent Runner's World article, world-class runners discussed their need for large amounts of sleep during peak competition and workout schedules. Many of the male runners expressed needing nine to ten hours of sleep during hard training or competition. It is becoming more apparent, in reviewing the research on peak performance, that sound sleeping patterns are extremely important in restoring the body and the mind (Porter & Foster, 1990, 23). The science of sleep (chronobiology) has discovered much about sleep, yet there is still much to be discovered.

Just why sleep is necessary to begin with, and what role it plays on furthering athletic abilities is not exactly understood. There are two major theories as to why we need sleep. One known as the **adaptive response** theory holds that humans developed the need to sleep as a matter of conserving our metabolic energies at a time (dark) when we could neither look for food, or see our foes. The **restorative process** is a theory that holds that we sleep to rest. According to this theory you burn up energy during the day; thus you need to remain quiet for long hours each night to restore your energy. It certainly is true that we go to bed feeling tired, and wake up the next day feeling better. While it appears in this fact that sleep does restore us, does sleep restore us more than would deep rest, in which you peacefully stayed awake? The answer appears to be no (McConnel, 1986, 58). Sleep then certainly appears to be a recharger for our mental state and is likely that both theories are true.

Sleep Stages

The average amount of sleep for adolescents and adults is about eight hours. During this time we go through 4-5 sleep cycles. Each cycle begins with a **stage 0** in which your breathing slows, your muscles relax, and your brain waves slow down. **Stage 1** lasts the next few minutes and is simply falling asleep. **Stage 2** shows bursts of brain activity that occur 13-16 times per second. This stage accounts for 40-60% of your total nights sleep. **Stage 3** is a brief transition period in which your brain waves slow down even more and the brain waves characteristic of deep sleep begin to show. From 3-12 percent of sleep generally occurs in this stage. **Stage 4** occurs about 40-60 minutes after you lose consciousness, you will have reached the deepest sleep of all, and it will be difficult for you to be awakened. 5-25% of your night's sleep occurs during stage 4. About 80 minutes

after you fall asleep you will enter the last stage of sleep known as **REM** sleep. REM stands for rapid eye motion, and is characteristic of brain waves similar to that of an awake brain and eyes darting around as in if you were looking at something. REM sleep lasts about 10 minutes the first sleep cycle and increases up to 40 minutes or more during subsequent cycles (McConnel, 1986, 60).

The amount of time spent in each stage will vary for the next cycles, however, the average time of a sleep cycle is about 90 minutes. There is a point in your cycle in which you will momentarily come awake, and feel fresh and ready to go. If you arise you will feel good, if you remain in bed you will fall back down to start another cycle. The problem arises when you satisfactorily complete a cycle, and arise in the morning minutes before you are supposed to wake up. You will find that if you awake twenty minutes before you need to, you are best to either lie in bed awake, or get up. Falling back asleep again will see you in stage three of the sleep cycle when the alarm goes off. It will then be difficult to arise.

Do runners actually need more sleep? The answer is not clear. If sleep has some physical power to rejuvenate more than rest, than the answer is clearly yes. However, sleep does not appear to do so. So perhaps the question then is, do we need more sleep to rejuvenate our mental state than non-runners? Dr. George Sheehan believes so, for times of heavy training, "Sleep is an active process during which some body functions actually reach their peak. Research has shown that sleep replenishes certain essential substances in the brain. Depletion of these substances seems to have a causal relation with depressive states. Sleep is also a major factor in the secretion of growth hormones" (Sheehan, 1978, 56). Running may also help us sleep better. James Fixx in his book The Complete Book of Running points to one survey conducted by the President's Council on Physical Fitness, that notes running as promoting better sleep than cycling, swimming, and many other activities

Circadian Rhythm

Your body clock, or circadian rhythm, plays a critical role in both your physical and mental health. Our circadian rhythm is kept on time by time cues: light, work, schedules, food, exercise, caffeine, mental stimulation, and sleep cycles. For this reason, eating, sleeping and exercising at about the same time each day helps keep our body clocks and our bodily functions ticking away on schedule. As a runner, the most important factor concerning your circadian rhythm is that you keep it as consistent as possible. Going to bed and arising the same time each day will do much to keep you on schedule. Otherwise, it is likely that you will feel lethargic, leaving you with what feels like jet lag. It may take several days to adjust to a new schedule.

Re-adjusting to a new schedule will certainly throw your rhythm off. If you must learn to awaken daily at 6:00 rather than 8:00 you can help alleviate the lethargy that is certain to follow by going to bed twenty minutes earlier, and arising twenty minutes earlier over a six day period. It should also be noted that the more sleep you get, the more sleep you need. If you sleep 11 hours a night, you need 11 hours a night. Slowly reducing your sleep time will also reduce your required amount of sleep time.

Maintaining a consistent circadian rhythm will help you feel your best daily. But what if you should miss a day of sleep? Should you sleep more to make up for it? After a period of 48-264 hours of sleep deprivation it has been shown that only 11-16 hours of straight sleep is required to "catch up". The effects of missing a few hours of sleep the night before a race are indeed minimal, if important at all. In fact, it is generally recognized that the sleep you receive two days before the race is more important for your physical state than is the sleep you receive the night before the race. Many a PRs have been gained off of very little sleep.

Sleeping Pills

It is not advisable to take sleeping pills to help you get a nights sleep. Though sleeping pills may help you fall through the 0-4 stages of sleep, they do not permit as deep a REM sleep as is needed. Avoiding sleeping pills the night before a race is especially important since they may leave you with a "hangover" of drowsiness the next day (Norton, 1991, 121). I recommend avoiding pills entirely the night before the race. The use of visualization and relaxation techniques is one of the best sleep inducing agent you can take the day before a race. (See Chapter 10 for more on visualization and relaxation).

Sex as a Sleep Inducing Agent

It should also be noted that sexual gratification too serves as a sleep inducing agent, especially for the male. Orgasm causes a general loss of voluntary muscle control, followed by a general relaxation of all the body's muscles, a phenomenon similar to that of a convulsion, which leaves, especially in the male, the individual feeling tired and ready for slumber (Allgeire, 1988, 191). It is far better to relieve your sexual tensions than it is to inhibit your sleep, or the time it takes to fall asleep by fighting the urge to release them. Contrary to myth, sexual activity, of any type (including masturbation) the night before a race will not deplete the runner of energy for the following day's efforts.

Napping

People have an inherent need to nap. Studies of people put into caves with no access to any time reference have found that people sleep twice in a 24-25 hour period. 6-7 hours once, and 1-2 hours again later. When the people in this underground experiment took naps, they confirmed a scientific hypothesis that naps are a part of the natural sleep cycle. People guided by their own circadian rhythm usually nap about 12 hours after the middle of the main period of sleep. If you sleep from 10 P.M. to 6 A.M. you would find yourself ready for a nap around 2 P.M. (Sheehan, 1991, 13). This is not new knowledge. The Hispanic culture has been taking afternoon Siestas for thousands of years. These naps also help with work productivity. We are most apt to quality work in the immediate hours after we awake in the morning. Throughout the day we lose productivity. An afternoon nap helps to replenish your ability to concentrate (Mirkin, 92).

High school and collegiate runners may find that they are ready for a nap after their afternoon practice. Considering practice generally is run from 2 P.M. to 4 P.M. there is a natural tendency to want to nap after. However, due to the lateness of arriving home, perhaps as late as 5 P.M. it is easy for this nap to turn into a few hours of sleep. If so, the runner needs to be advised to either insure more sleep during the night, or watch for other possible signs of overtraining. It is recommended to arrive home from a workout, do any dirty work (chores) necessary, shower, then nap. Lie down for your nap in a different place than you sleep. This will help to tell your body that it is only a nap. Showering prior to your nap, will make you feel more comfortable and will further a quality nap. Once you awaken from the nap, get up, even if it has only been 10 minutes. You are done, ready to go. Closing your eyes and attempting to further your nap may lead to sleep. Which as we all know will render you useless the rest of the night, if you wake up at all.

I find naps most enjoyable after a race. On many occasions we have to arise extremely early to get to the race, and then we are fatigued after. Arriving home to a shower, some nourishment, and a nap is most welcomed and a great way of rewarding yourself for a difficult physical exertion.

Music

Music can serve as an ergogenic aid in either increasing or decreasing your level of arousal. As mentioned in Chapter Ten, an arousal level that is either too low or too high will hinder your performance (Williams, 1989, 139). Music can help to either increase your arousal or decrease it, depending on what you want, simply by what type of music you choose.

We discussed self-talk in Chapter Ten; Brent Rushall, Ph.D. says that there are three types of self-talk that improve performance. The first is task relevant self-talk which we discussed in great detail in Chapter Ten “loose and relaxed I run my max”. The second type of self-talk is that of mood words, such as “I’m a stud” or “Fly” which have an emotional impact and lead to a physical reaction (Othersen, 91, 18). The third type of self-talk, comes from music. The words fall into the category of mood words, yet they are not your own. Singing these words to yourself, turns these words into your own. Add to that the power of the music itself and you have an influential motivator. Dr. Rushall suggests using words such as in Michael Jackson's Bad “I’m bad, I’m bad, you know I’m bad” that serve not only as positive self-talk, but is motivational in itself. If you know that the slang for “Bad” is actually good.

Music and Endorphins

The benefits of music does not end here. Music has the power to further enhance your running by releasing endorphins from the brain that act as opiates and bind to opiate receptor sites which increases your threshold for pain. These natural pain killers are the same ones that are released when we begin to run. Many believe these pain killers (enkephalin and endorphin) to be the cause of the runner's high since not only do these drugs raise your pain threshold but they stimulate nerve centers, which are involved in experiencing pleasure.

For these reasons, the use of music may help an athlete’s performance. I recall reading one study where 32 minute 10K runners improved their performance by around thirty seconds when given up-beat music on a treadmill test; though now I can't seem to find that research. The problem with music lies in the methods employed to hear it during a run. It is disadvantageous to carry a tape player type “walkman” while running. It is certainly too bulky and heavy. The smaller “sports types” are more advantageous, since you can slip them into a pocket, or press them between the elastic of your shorts and skin. Still, these have a drawback in that you must choose a station which will inevitably have fast paced and slow paced songs; in addition to the commercials. The best method would be to somehow have the music played without your having to carry anything at all. I occasionally utilize my home stereo and my van's stereo system by placing them on opposite ends of the track, and letting my runners do a speed session around the track with the aid of up-beat rock music. This helps them run a better workout, and makes it pass quicker. I recommend listening to a soft rock station for the warm up and then switching the station to a more up-beat one.

TRACKS, TIMES, TALK

This chapter is devoted toward making the world of the distance runner easier to understand. It will see an analysis of the track, times, and then give some common runner's jargon with an explanation of what is meant. We begin with the track.

Track Dimensions:

There are currently three types of tracks in use. They are: the 440 yard track, the 400 meter track, and the indoor track. All races in America used to be run on a yard track, in miles or increments of. We raced the 220 meter, the half mile, the two mile, etc... With the push of the metric system we later began using metric races, on our yard tracks. We began racing the 1600 meters, the 800 meters, the 200 meters. These distances are close enough to their yards counterparts that little difficulty was encountered other than attempting to decide when a meter race was of sufficient time to qualify it to take over a yard record on our record boards. Recent tracks are measured in meters, not miles. 400 meters per lap, or 1600 meters per four laps.

The 440 Yard Track

- A standard 440 yard track has two straight sides and two curved ends.
- The curves are the same length as the straightaway on a normal track. There do exist short curved or short turned tracks.
- There may be a 2% incline toward the center of the track for drainage purposes.
- There may be no more than a 1% incline in the running direction
- The standard lane width is 42 inches (1.07 M) but it may vary depending upon the number of lanes available.
- The track is measured one foot from the curb (30 cm) if it has a cement curb, and 8 inches (20 cm) from the center if it has a painted line (all weather).
- All 400 meter or 440 yard staggered lanes are the same distance around the track.

What's Important: Since the track is measured either 8 or 12 inches from the curb it is important for the distance runner to know that for every foot farther away from the curb he runs, he will run 6 feet farther per lap (if it is a curbed track). The following information shows just how much extra a runner would run per race if he ran in the second lane the whole way. This would be for two thin runners, with virtually no distance between them, on a track measured one foot from the curb.

800 Meters: 36 feet or approximately 12 meters
 1500 Meters: 54 feet or approximately 18 meters
 1600 Meters: 72 feet or approximately 24 meters
 3000 Meters: 108 feet or approximately 36 meters
 3200 Meters: 144 feet or approximately 48 meters
 5000 Meters: 216 feet or approximately 72 meters
 10000 Meters: 432 feet or approximately 144 meters

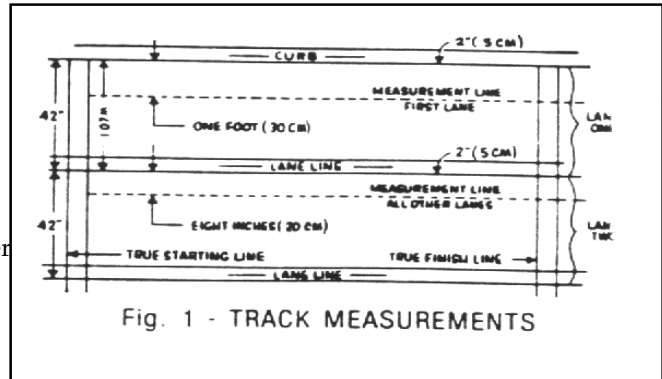


Fig. 1 - TRACK MEASUREMENTS

The 400 Meter Track

- The 400 meter track is basically the same as the 440 yard track, with the exception that it is 2.25 meters shorter.

Converting Records

It is possible to accurately determine that at a given speed you would have finished a certain race at an exact time. However, I do not personally agree with giving records for meter races, saying that at that pace they would have broken the yard record by.... One never truly knows what might have happened in those final feet. We have all seen someone collapse inches before the line. However, for other purposes it is helpful to use the following formulas to determine what your time would have been.

Metric to English Distances

English to Metric Distances

200 meters	= 218 yards, 2 feet, 2 inches (0.124 miles)	1/8 mile (220 yards)	= 201.168 meters
400 meters	= 437 yards, 1 foot 4 inches (0.249 miles)	1/4 mile (440 yards)	= 402.336 meters
800 meters	= 874 yards, 2 feet 8 inches (0.497 miles)	1/2 mile (880 yards)	= 804.672 meters
1,000 meter (1 kilometer)	= .622 miles	3/4 miles (1320 yards)	= 1207.008 meter
1,500 meters (1.5 kilometers)	= 0.93 miles	1 mile	= 1609.344 meter
3,000 meters (3 kilometers)	= 1.86 miles	2 miles	= 2318.688 meter
5,000 meters (5 kilometers)	= 3.11 miles	3 miles	= 4828 meters
8,000 meters (8 kilometers)	= 4.97 miles	5 miles	= 8047 meters

10,000 meters (10 kilometers)	= 6.21 miles	6 miles	= 9656 meters
15,000 meters (15 kilometers)	= 9.32 miles	10 miles	= 16193 meters
20,000 meters (20 kilometers)	= 12.43 miles	Half Marathon (13.1 mil)	= 21098 meters
25,000 meters (25 kilometers)	= 15.53 miles	Marathon (26.22 miles)	= 42195 meters
30,000 meters (30 kilometers)	= 18.64 miles	30 miles	= 48280 meters

Converting Miles into Meters	Converting Meters into Miles
<p>Take your total time in seconds Divide by the number of meters of the actual race Multiply by the # of meters of desired race desired race</p> <p>Example: You ran a 5:00 mile</p> <p>1) 300 seconds divided by 1609 meters =.1864512 .1864512 2) multiply by desired race of 1500 meters =279.67 3) Your 1500 meter time is 4:39.6</p>	<p>Take total time in seconds Divide by number of meters in race Multiply by the number feet in</p> <p>Example: Your ran a 4:39.67 1500 meters</p> <p>1) 279.6 divided by 1500 meters = 2) Multilied by desired race of 1609 = 300 3) Your time is 5:00</p>

Hand Times vs. Electronic Times

A hand taken time will be faster than the actual time. This is due to the lateness in which we react to the sound or smoke from the gun. We also tend to stop our watches just before the runner hits the line, making our hand held times considerably faster. After taking a hand held time you should add a minimum of .24 seconds for races shorter than 1 lap and .14 for races of one lap or more. Hand taken times are not supposed to be given a hundredths of seconds time. The hundredths of seconds are always to be rounded up to the tenths. Only an accu-track or other electronic timing device, not relying on human reactions, should give a hundredths time.

Time Equivalency Charts

The following time equivalency charts will help you predict what you might be able to run based upon a given performance. These charts do not take into account your particular physiological factors, environment, and racing conditions. The math employed behind them is not flawless. They are simply the creator's best effort at a fair comparison chart. They are not pace charts! It should be noted that each runner excels at a particular distance. Therefore the world's fastest half miler is not expected to also be the world's fastest marathon runner. The chart only says that a 5:24 mile is equal to a 39:58 ten kilometer, it does not say that you should be able to run that. If you are more speed

oriented perhaps you can not. If you are more endurance oriented, and you train properly, perhaps you can.

The two following comparison charts were developed by Gerry Purdy and included in James B. Gardners and J. Gerry Purdy's *Computerized Running Training Programs*. If you are interested in acquiring these computer programs you may write to: Track and Field News Press at 2570 El Camino Real, Suite 606, Mountain View, California, 94040. Or call at (415) 948-9445.

Comparative Performance for Track Racing
Road Racing

Comparative Performance for

800	1500	Mile	3000	2 mile	5000	10,000
1:40.6	3:27.8	3:45.1	7:29.3	8:05.1	12:58.2	27:08.7
1:41.1	3:28.9	3:46.3	7:31.7	8:07.7	13:02.5	27:17.8
1:41.6	3:30.0	3:47.5	7:34.2	8:10.4	13:06.8	27:27.0
1:42.2	3:31.1	3:48.8	7:36.7	8:13.1	13:11.2	27:36.2
1:42.7	3:32.2	3:50.0	7:39.2	8:15.8	13:15.6	27:45.6
1:43.2	3:33.4	3:51.2	7:41.8	8:18.5	13:20.1	27:55.1
1:43.8	3:34.5	3:52.5	7:44.3	8:21.3	13:24.6	28:04.7
1:44.3	3:35.7	3:53.8	7:46.9	8:24.1	13:29.2	28:14.4
1:44.9	3:36.9	3:55.1	7:49.6	8:27.0	13:33.8	28:24.2
1:45.4	3:38.1	3:56.4	7:52.2	8:29.9	13:38.5	28:34.1
1:46.0	3:39.3	3:57.7	7:54.9	8:32.8	13:43.2	28:44.1
1:46.6	3:40.5	3:59.0	7:57.7	8:35.7	13:48.0	28:54.3
1:47.1	3:41.8	4:00.4	8:00.4	8:38.7	13:52.8	29:04.6
1:47.7	3:43.0	4:01.7	8:03.2	8:41.7	13:57.7	29:15.0
1:48.3	3:44.3	4:03.1	8:06.0	8:44.8	14:02.7	29:25.5
1:48.9	3:45.6	4:04.5	8:08.9	8:47.9	14:07.7	29:36.2
1:49.5	3:46.8	4:05.9	8:11.8	8:51.0	14:12.8	29:47.0
1:50.1	3:48.2	4:07.3	8:14.7	8:54.2	14:17.9	29:57.9
1:50.7	3:49.5	4:08.8	8:17.7	8:57.4	14:23.1	30:08.9
1:51.3	3:50.8	4:10.2	8:20.6	9:00.6	14:28.3	30:20.1
1:52.0	3:52.2	4:11.7	8:23.7	9:03.9	14:33.7	30:31.4
1:52.6	3:53.6	4:13.2	8:26.7	9:07.2	14:39.1	30:42.9
1:53.2	3:54.9	4:14.7	8:29.8	9:10.6	14:44.5	30:54.9
1:53.9	3:56.3	4:16.2	8:33.0	9:14.0	14:50.0	31:06.3
1:54.5	3:57.8	4:17.8	8:36.2	9:17.4	14:55.6	31:18.2
1:55.2	3:59.2	4:19.3	8:39.4	9:20.9	15:01.3	31:30.3
1:55.9	4:00.7	4:20.9	8:42.7	9:24.4	15:07.1	31:42.5
1:56.5	4:02.1	4:22.5	8:46.0	9:28.0	15:12.9	31:54.9
1:57.2	4:03.6	4:24.1	8:49.3	9:31.6	15:18.8	32:07.4
1:57.9	4:05.1	4:25.8	8:52.7	9:35.3	15:24.7	32:20.1
1:58.6	4:06.7	4:27.4	8:56.1	9:39.0	15:30.8	32:33.0
1:59.3	4:08.2	4:29.1	8:59.6	9:42.8	15:36.9	32:46.0
2:00.1	4:09.8	4:30.8	9:03.1	9:46.6	15:43.1	32:59.3
2:00.8	4:11.4	4:32.6	9:06.7	9:50.4	15:49.4	33:12.7
2:01.5	4:13.0	4:34.3	9:10.7	9:54.3	15:55.7	33: 26.3

5 Kil	8 Kil	10K	Marathon
12:58	21:23	27:09	2:06:18
13:02	21:30	27:17	2:07:02
13:06	21:38	27:27	2:07:45
13:11	21:45	27:36	2:08:30
13:15	21:52	27:45	2:09:14
13:20	22:00	27:55	2:10:00
13:24	22:08	28:04	2:10:46
13:29	22:15	28:14	2:11:32
13:33	22:22	28:24	2:12:19
13:38	22:30	28:34	2:13:06
13:43	22:38	28:44	2:13:54
13:48	22:45	28:54	2:14:43
13:52	22:52	29:04	2:15:32
13:57	23:02	29:15	2:16:22
14:02	23:10	29:25	2:17:12
14:07	23:20	29:36	2:18:04
14:12	23:28	29:47	2:18:55
14:17	23:35	29:57	2:19:48
14:23	23:45	30:08	2:20:41
14:28	23:53	30:20	2:21:34
14:33	24:00	30:31	2:22:29
14:39	24:10	30:42	2:23:24
14:44	24:20	30:54	2:24:20
14:50	24:30	31:06	2:25:10
14:55	24:40	31:18	2:26:13
15:01	24:48	31:30	2:27:11
15:07	24:58	31:43	2:28:10
15:12	25:08	31:55	2:29:10
15:18	25:17	32:07	2:30:10
15:24	25:27	32:20	2:31:11
15:30	25:37	32:33	2:32:13
15:36	25:48	32:46	2:33:16
15:43	25:58	32:59	2:34:20
15:49	26:09	33:12	2:35:25
15:55	26:19	33:26	2:36:30
16:02	26:30	33:40	2:37:37
16:08	26:41	33:54	2:38:44
16:15	26:52	34:08	2:39:53
16:22	27:03	34:23	2:41:02
16:28	27:15	34:37	2:42:13
16:35	27:26	34:52	2:43:24
16:42	27:38	35:07	2:44:37
16:49	27:50	35:22	2:45:50
16:57	28:02	35:37	2:47:05
17:04	28:14	35:53	2:48:21
17:11	28:27	36:01	2:49:38
17:19	28:39	36:25	2:50:56
17:27	28:52	36:41	2:52:15
17:34	29:05	36:58	2:53:36
17:42	29:18	37:14	2:54:58
17:50	29:32	37:31	2:56:21

5 Kil	8Kil	10K	Marathon
18:15	30:13	38:24	3:00:39
18:23	30:27	38:43	3:02:07
18:32	30:42	39:01	3:03:37
18:41	30:56	39:20	3:05:09
18:50	31:11	39:39	3:06:42
18:59	31:26	39:58	3:08:17
19:08	31:42	40:18	3:09:53
19:17	31:57	40:38	3:11:32
19:27	32:13	40:58	3:13:11
19:36	32:30	41:19	3:14:53
19:46	32:46	41:40	3:16:36
19:56	33:03	42:02	3:18:21
20:06	33:20	42:23	3:20:08
20:17	33:37	42:46	3:21:57
20:27	33:55	43:08	3:23:48
20:38	34:13	43:31	3:25:41
20:49	34:31	43:55	3:27:36
21:00	34:50	44:18	3:29:34
21:11	35:08	44:43	3:31:33
21:22	35:28	45:07	3:33:35
21:34	35:47	45:32	3:35:39
21:46	36:07	45:58	3:37:46
21:58	36:28	46:24	3:39:55
22:10	36:48	46:51	3:42:06
22:23	37:10	47:18	3:44:21
22:36	37:31	47:46	3:46:38
22:49	37:53	48:14	3:48:58
23:02	38:16	48:42	3:51:21
23:15	38:38	49:12	3:53:46
23:29	39:02	49:42	3:56:15
23:43	39:26	50:12	3:58:47
23:58	39:50	50:43	4:01:23
24:12	40:15	51:15	4:04:02
24:27	40:40	51:48	4:06:44
24:43	41:06	52:21	4:09:30
24:58	41:32	52:55	4:12:20
25:14	41:59	53:29	4:15:13
25:30	42:27	54:05	4:18:11
25:47	42:55	56:41	4:21:13
26:04	43:24	55:18	4:24:19
26:21	43:53	55:56	4:27:29
26:39	44:23	56:35	4:30:45
26:57	44:54	57:14	4:34:05
27:16	45:26	57:55	4:37:30
27:35	45:58	58:36	4:41:00
27:54	46:31	59:19	4:44:36
28:14	47:05	60:02	4:48:17

2:02.3	4:14.6	4:36.1	9:14.0	9:58.3	16:02.2	33:40.0
2:03.0	4:16.3	4:37.9	9:17.7	10:02.3	16:08.7	33:54.0
2:03.8	4:17.9	4:39.7	9:21.4	10:06.4	16:15.4	34:08.1
2:04.6	4:19.6	4:41.6	9:25.3	10:10.5	16:22.1	34:22.5
2:05.4	4:21.4	4:43.4	9:29.1	10:14.7	16:28.9	34:37.1
2:06.2	4:23.1	4:45.3	9:33.0	10:19.0	16:35.8	34:51.8
2:07.0	4:24.9	4:47.2	9:37.0	10:23.3	16:42.8	35:06.8
2:07.8	4:26.7	4:49.2	9:41.0	10:27.6	16:49.9	35:22.0
2:08.6	4:28.5	4:51.2	9:45.1	10:32.0	16:57.2	35:37.4
2:09.5	4:30.3	4:53.2	9:49.3	10:36.5	17:04.5	35:53.0
2:10.3	4:32.2	4:55.2	9:53.5	10:41.1	17:11.9	36:08.9
2:11.2	4:34.0	4:57.2	9:57.7	10:45.7	17:19.4	36:25.0
2:12.0	4:36.0	4:59.3	10:02.1	10:50.4	17:27.1	36:41.4
2:12.9	4:37.9	5:01.4	10:06.4	10:55.1	17:34.8	36:57.9
2:13.8	4:39.9	5:03.6	10:10.9	10:59.9	17:42.7	37:14.8

Continued on next page

800	1500	Mile	3000	2 mile	5000	10,000
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2:14.7	4:41.9	5:05.8	10:15.4	11:04.8	17:50.7	37:31.9
2:15.6	4:43.9	5:08.0	10:20.0	11:09.8	17:58.8	37:49.3
2:16.6	4:46.0	5:10.2	10:24.7	11:14.8	18:07.0	38:06.9
2:17.5	4:48.0	5:12.5	10:29.4	11:20.0	18:15.4	38:24.8
2:18.5	4:50.1	5:14.8	10:34.2	11:25.2	18:23.9	38:43.0
2:19.4	4:52.3	5:17.1	10:39.0	11:30.4	18:32.5	39:01.5
2:20.4	4:54.5	5:19.5	10:44.0	11:35.8	18:41.2	39:20.3
2:21.4	4:56.7	5:21.9	10:49.0	11:41.2	18:50.1	39:39.3
2:22.4	4:58.9	5:24.3	10:54.1	11:46.8	18:59.2	39:58.7
2:23.5	5:01.2	5:26.8	10:59.3	11:52.4	19:08.3	40:18.4
2:24.5	5:03.5	5:29.3	11:04.6	11:58.1	19:17.7	40:38.5
2:25.6	5:05.9	5:31.9	11:09.9	12:03.9	19:27.2	40:58.9
2:26.6	5:08.3	5:34.5	11:15.3	12:09.8	19:36.8	41:19.6
2:27.7	5:10.7	5:37.1	11:20.9	12:15.7	19:46.6	41:40.7
2:28.8	5:13.1	5:39.8	11:26.5	12:21.8	19:56.6	42:02.1
2:30.0	5:15.6	5:42.5	11:32.2	12:28.0	20:06.7	42:23.9
2:31.1	5:18.2	5:45.3	11:38.0	12:34.3	20:17.0	42:46.1
2:32.3	5:20.8	5:48.1	11:43.9	12:40.7	20:27.5	43:08.6
2:33.4	5:23.4	5:51.0	11:49.9	12:47.2	20:38.2	43:31.6
2:34.6	5:26.1	5:53.9	11:56.0	12:53.8	20:49.0	43:55.0
2:35.8	5:28.8	5:56.9	12:02.2	13:00.6	21:00.1	44:18.8
2:37.1	5:31.5	5:59.9	12:08.6	13:07.4	21:11.3	44:43.0
2:38.3	5:34.3	6:02.9	12:15.0	13:14.4	21:22.8	45:07.7
2:39.6	5:37.2	6:06.0	12:21.5	13:21.5	21:34.4	45:32.9
2:40.9	5:40.0	6:09.2	12:28.2	13:28.7	21:46.3	45:58.5
2:42.2	5:43.1	6:12.4	12:35.0	13:36.1	21:58.4	46:24.6
2:43.5	5:46.1	6:15.7	12:41.9	13:43.6	22:10.7	46:51.2
2:44.9	5:49.1	6:19.3	12:49.0	13:51.2	22:23.3	47:18.3

2:46.3 5:52.2 6:23.0 12:56.1 13:59.0 22:36.0 47:46.0
2:47.7 5:55.4 6:25.9 13:03.4 14:06.9 22:49.1 48:14.1
2:49.1 5:58.6 6:29.4 13:10.9 14:15.0 23:02.4 48:42.9
2:50.5 6:01.9 6:33.0 13:18.5 14:23.2 23:15.9 49:12.2
2:52.0 6:05.3 6:36.6 13:26.2 14:31.6 23:29.7 49:42.1
2:53.5 6:08.7 6:40.4 13:34.1 14:40.1 23:43.8 50:12.7
2:55.1 6:12.1 6:44.2 13:42.1 14:48.9 23:58.2 50:43.8
2:56.6 6:15.7 6:48.0 13:50.3 14:57.8 24:12.8 51:15.6
2:58.2 6:19.3 6:52.0 13:58.7 15:06.8 24:27.8 51:48.1
2:59.8 6:23.0 6:56.0 14:07.2 15:16.1 24:43.1 52:21.3
3:01.4 6:26.7 7:00.1 14:15.9 15:25.6 24:58.7 52:55.2
3:03.1 6:30.5 7:04.2 14:24.8 15:35.2 25:14.6 53:29.8
3:04.8 6:34.4 7:08.5 14:33.9 15:45.1 25:30.9 54:05.2
3:06.6 6:38.4 7:12.8 14:43.2 15:55.1 25:47.5 54:41.4
3:08.3 6:42.5 7:17.3 14:52.7 16:05.4 26:04.5 55:18.4
3:10.1 6:46.6 7:21.8 15:02.4 16:15.9 26:21.9 55:56.3
3:12.0 6:50.8 7:26.4 15:12.2 16:26.7 26:39.7 56:35.0
3:13.8 6:55.1 7:31.1 15:22.4 16:37.6 26:57.8 57:14.6
3:15.7 6:59.6 7:35.9 15:32.7 16:48.9 27:16.4 57:55.2

Pace Comparison Chart

Minutes Per Mile Chart (MPM to finish time)

Min/Mile Miles/hr Min/Kil Kil/hr

M/P/M 5 KM 5 MI 10KM 10 M 13.1 MI MARATHON

4:00	15.0	2:29	24.11
4:10	14.4	2:35	23.15
4:20	13.84	2:41	22.25
4:30	13.33	2:47	21.43
4:40	12.85	2:54	20.65
4:50	12.41	3:00	19.95
5:00	12.00	3:06	19.29
5:10	11.61	3:12	18.66
5:20	11.25	3:18	18.08
5:30	10.90	3:25	17.52
5:40	10.58	3:31	17.00
5:50	10.28	3:37	16.52
6:00	10.00	3:43	16.07
6:10	9.73	3:49	15.64
6:20	9.47	3:56	15.22
6:30	9.23	4:02	14.83
6:40	9.00	4:08	14.46
6:50	8.78	4:14	14.11
7:00	8.57	4:21	13.77
7:10	8.37	4:27	13.45
7:20	8.18	4:33	13.15
7:30	8.00	4:39	12.86
7:40	7.82	4:45	12.57
7:50	7.65	4:52	12.29
8:00	7.50	4:58	12.05
8:10	7.34	5:04	11.80
8:20	7.20	5:10	11.57
8:30	7.05	5:16	11.33
8:40	6.92	5:23	11.12
8:50	6.79	5:29	10.91
9:00	6.66	5:35	10.70
9:10	6.54	5:41	10.51
9:20	6.42	5:48	10.32
9:30	6.31	5:54	10.14
9:40	6.20	6:00	9.96
9:50	6.10	6:06	9.80
10:00	6.00	6:12	9.64

4:30	13:59	22:30	27:58	45:00	58:57	1:57:59
4:35	14:14	22:55	28:29	45:50	1:00:03	2:00:10
4:40	14:30	23:20	29:00	46:40	1:01:08	2:02:21
4:45	14:45	23:45	29:31	47:30	1:02:13	2:04:32
4:50	15:01	24:10	30:02	48:20	1:03:19	2:06:44
4:55	15:17	24:35	30:33	49:10	1:04:24	2:08:55
5:00	15:32	25:00	31:04	50:00	1:05:30	2:11:06
5:05	15:48	25:25	31:35	50:50	1:06:36	2:13:17
5:10	16:03	25:50	32:06	51:40	1:07:41	2:15:28
5:15	16:19	26:15	32:37	52:30	1:08:47	2:17:39
5:20	16:34	26:40	33:08	53:20	1:09:52	2:19:50
5:25	16:50	27:05	33:39	54:10	1:10:58	2:22:01
5:30	17:05	27:30	34:11	55:00	1:12:03	2:24:12
5:35	17:21	27:55	34:42	55:50	1:13:08	2:26:23
5:40	17:36	28:20	35:13	56:40	1:14:14	2:28:34
5:45	17:52	28:45	35:44	57:30	1:15:19	2:30:46
5:50	18:07	29:10	36:15	58:20	1:16:25	2:32:57
5:55	18:23	29:35	36:46	59:10	1:17:30	2:35:08
6:00	18:38	30:00	37:17	1:00:00	1:18:36	2:37:19
6:05	18:54	30:25	37:48	1:00:50	1:19:41	2:39:30
6:10	19:10	30:50	38:19	1:01:40	1:20:47	2:41:40
6:15	19:25	31:15	38:50	1:02:30	1:21:53	2:43:52
6:20	19:41	31:40	39:21	1:03:20	1:22:58	2:46:03
6:25	19:56	32:05	39:52	1:04:10	1:24:04	2:48:14
6:30	20:12	32:30	40:23	1:05:00	1:25:09	2:50:25
6:35	20:27	32:55	40:54	1:05:50	1:26:15	2:52:37
6:40	20:43	33:20	41:25	1:06:40	1:27:20	2:54:48
6:45	20:58	33:45	41:57	1:07:30	1:28:25	2:56:59
6:50	21:14	34:10	42:28	1:08:20	1:29:31	2:59:10
6:55	21:29	34:35	42:59	1:09:10	1:30:36	3:01:21
7:00	21:45	35:00	43:30	1:10:00	1:31:42	3:03:32

440 Yard Track Pacing Table

<u>440</u>	<u>800 M</u>	<u>1500</u>	<u>Mile</u>	<u>3,000 M</u>	<u>5,000 M</u>	<u>10,000</u>
52	1:43.4					
53	1:45.3					
54	1:47.3					
55	1:49.3					
56	1:51.3	3:28.7	3:44.0			
57	1:53.3	3:32.5	3:48.0			
58	1:55.3	3:36.2	3:52.0			
59	1:57.3	3:39.9	3:56.0			
60	1:59.3	3:43.6	4:00.0	7:27.3		
61	2:01.2	3:47.4	4:04.0	7:34.8		
62	2:03.2	3:51.1	4:08.0	7:42.3	12:50.5	
63	2:05.2	3:54.8	4:12.0	7:49.7	13:02.9	
64	2:07.2	3:58.6	4:16.0	7:57.2	13:15.3	
65	2:09.2	4:02.3	4:20.0	8:04.6	13:27.7	26:55.5
66	2:11.2	4:06.1	4:24.0	8:12.1	13:40.2	27:20.4
67	2:13.2	4:09.7	4:28.0	8:19.5	13:52.6	27:45.2
68	2:15.2	4:13.5	4:32.0	8:27.0	14:05.0	28:10.1
69	2:17.2	4:17.2	4:36.0	8:34.4	14:17.4	28:34.9
70	2:19.1	4:20.9	4:40.0	8:41.9	14:29.9	28:59.8
71	2:21.1	4:24.7	4:44.0	8:49.4	14:42.3	29:24.6
72	2:23.1	4:28.4	4:48.0	8:56.8	14:54.7	29:49.5
73	2:25.1	4:32.1	4:52.0	9:04.3	15:07.2	30:14.4
74	2:27.1	4:35.8	4:56.0	9:11.7	15:19.6	30:39.2
75	2:29.1	4:39.6	5:00.0	9:19.2	15:32.0	31:04.1
76	2:31.1	4:43.3	5:04.0	9:26.6	15:44.4	31:28.9
77	2:33.1	4:47.0	5:08.0	9:34.1	15:56.9	31:53.8
78	2:35.1	4:50.8	5:12.0	9:41.6	16:09.3	32:18.6
79	2:37.0	4:54.5	5:16.0	9:49.0	16:21.7	32:43.5
80	2:39.0	4:58.2	5:20.0	9:56.5	16:34.1	33:08.3
81	2:41.0	5:01.9	5:24.0	10:03.9	16:46.6	33:32.2
82	2:43.0	5:05.7	5:28.0	10:11.4	16:59.0	33:58.0
83	2:45.0	5:09.4	5:32.0	10:18.8	17:11.4	34:22.9
84	2:47.0	5:13.1	5:36.0	10:26.3	17:23.9	34:47.8
85	2:49.0	5:16.9	5:40.0	10:33.8	17:36.3	35:12.6
86	2:51.0	5:20.6	5:44.0	10:41.2	17:48.7	35:37.5
87	2:52.9	5:24.3	5:48.0	10:48.7	18:01.1	36:02.3
88	2:54.9	5:28.0	5:52.0	10:56.1	18:13.6	36:27.2
89	2:56.9	5:31.8	5:56.0	11:03.6	18:26.0	36:52.0
90	2:58.9	5:35.5	6:00.0	11:11.0	18:38.4	37:16.9

400 Meter Track Pacing Table

<u>440</u>	<u>800 M</u>	<u>1500</u>	<u>Mile</u>	<u>3,000 M</u>	<u>5,000 M</u>	<u>10,000</u>
52	1:44					
53	1:46					
54	1:48					
55	1:50	3:26.2	3:41.2			
56	1:52	3:30.0	3:45.3			
57	1:54	3:33.7	3:49.3			
58	1:56	3:37.5	3:53.3			
59	1:58	3:41.2	3:57.3			
60	2:00	3:45.0	4:01.4	7:30.0		
61	2:02	3:48.7	4:05.4	7:37.5		
62	2:04	3:52.5	4:09.4	7:45.0	12:55.0	
63	2:06	3:56.2	4:13.4	7:52.5	13:07.5	
64	2:08	4:00.0	4:17.5	8:00.0	13:20.0	
65	2:10	4:03.7	4:21.5	8:07.5	13:32.5	27:05
66	2:12	4:07.5	4:25.4	8:15.0	13:45.0	27:30
67	2:14	4:11.2	4:29.5	8:22.5	13:57.5	27:55
68	2:16	4:15.0	4:33.5	8:30.0	14:10.0	28:20
69	2:18	4:18.7	4:37.6	8:37.5	14:22.5	28:45
70	2:20	4:22.5	4:41.6	8:45.0	14:35.0	29:10
71	2:22	4:26.2	4:45.6	8:52.5	14:47.5	29:35
72	2:24	4:30.0	4:49.6	9:00.0	15:00.0	30:00
73	2:26	4:33.7	4:53.7	9:07.5	15:12.5	30:25
74	2:28	4:37.5	4:57.7	9:15.0	15:25.0	30:50
75	2:30	4:41.2	5:01.7	9:22.5	15:37.5	31:15
76	2:32	4:45.0	5:05.7	9:30.0	15:50.0	31:40
77	2:34	4:48.7	5:09.8	9:37.5	16:02.5	32:05
78	2:36	4:52.5	5:13.8	9:45.0	16:15.0	32:30
79	2:38	4:56.2	5:17.8	9:52.5	16:27.5	32:55
80	2:40	5:00.0	5:21.8	10:00.0	16:40.0	33:20
81	2:42	5:03.7	5:25.8	10:07.5	16:52.5	33:45
82	2:44	5:07.5	5:29.9	10:15.0	17:05.0	34:10
83	2:46	5:11.2	5:33.9	10:22.5	17:17.5	34:35
84	2:48	5:15.0	5:37.9	10:30.0	17:30.0	35:00
85	2:50	5:18.7	5:41.9	10:37.5	17:42.5	35:25
86	2:52	5:22.5	5:46.0	10:45.0	17:55.0	35:50
87	2:54	5:26.2	5:50.0	10:52.5	18:07.5	36:15
88	2:56	5:30.0	5:54.0	11:00.0	18:20.0	36:40
89	2:58	5:33.7	5:58.0	11:07.5	18:32.5	37:05
90	3:00	5:37.5	6:02.1	11:15.0	18:45.0	37:30

How Courses are Measured

USA Track & Field is the main governing body over running; it used to be called TAC. USA Track & Field both sanctions and certifies our events and courses. A sanctioned event is one that has purchased a two million dollar insurance policy. A certified course is one that has been properly measured by USAT&F. A certified course is measured by a certified person. They can use a wheel, tape, or other device that has been checked on a measuring course. The course is measured three times. It used to be that courses were measured three feet from the curb, but this is not so anymore. Courses are now measured by the shortest route possible. To run the exact distance you must hug the corners and run the tangents.

The USAT&F representative will add a 1% of 1/10 the distance per mile to the course. This serves as a standard error of measurement. Only with this standard error of measurement added to the exact distance of the course, is it certifiable. Once the course is certified then any record run on this course will count. This 1/10th of 1% of each mile does not really add up to much. The following is a list of races and the extra distance that will be run in each and how much time extra it would take at a five minute per mile pace.

5 Kilometer course	= 16.36 feet
8 Kilometer course	= 26.24 feet
10 Kilometer course	= 32.73 feet
10 Mile race	= 52.8 feet
Half Marathon	= 69.16 feet
Marathon	= 138.44 feet

5 kilometer course	= .92 seconds
8 kilometer course	= 1.49 seconds
10 kilometer course	= 1.86 seconds
10 mile race	= 3.00 seconds
Half Marathon	= 3.92 seconds
Marathon	= 7.86 seconds

Cross Country courses too are measured, and often certified. However, the nature of the terrain is constantly changing. Paths re-route themselves, hills become steeper, and bushes grow wider, all alter the true distance of a measured course. A non-certified cross country course, such as a high school course, or even a collegiate course, is often measured from the distance that a racer in the pack might run. But most often it's measured via the shortest route possible.

Spikes

Spikes are used predominantly on the track. Spikes provide increased traction, especially on a dirt track. However there exists drawbacks as well. The obvious drawback is the danger of wearing sharp instruments on the bottom of your shoes. The damage

possible by stepping on someone's foot can be great. It is also essential to leave adequate distance between you and the runner in front of you; for two reasons. First, if you get too close to another runner you could step on his Achilles tendon with your spikes, you could ruin his running career forever. Secondly, chances are he too is wearing spikes, and it is easy to be spiked by his outstretched foot.

Besides these obvious dangers there is another danger that we don't often consider. Spiked racing shoes are low to the ground; they have very little heel. This low heel places more of a stretch on your Achilles tendon, which will give you more power, but will also increase the possibility of straining your Achilles. Too much running, too soon in spikes may lead to Achilles Tendonitis. Furthermore, the lack of cushioning in spiked racing shoes (also called spikes) make the possibility of shin splints, heel bruises, and stress fractures much greater. You are advised to begin wearing your spikes to do your warm up on the grass, then slowly progress with the frequency and duration that you wear your spikes.

It is best to buy a new pair of spike receptacles for every race. The typical high school runner will race once or twice a week. Therefore, he can perhaps wear his new receptacles for his Thursday and Saturday races, and then wear them to train in the next week; buying a new pair before the next race. Worn down spikes provide for much less traction than do sharp ones.

If you let your spikes wear down excessively you may never get them out of the shoe again, yet another important reason to change them often. If they appear to be stuck, do not mess around with a spike key. Chances are you will strip them further and never get them out. Move right to the big machinery, pull out the pliers, and remove the stuck spike. If they get down too far you will have to drill down the middle of the spike with a metal drill to get it out.

When carrying your spikes in your bag, it is recommended to put the two shoes together, and to tie them together with their laces. If you put your spikes in your bag loose they will put holes in each other and your clothes as well.. The spikes will also pierce the wall of your bag, and you may scratch or cut yourself.

Never walk on the cement with your spikes. The shoe comes with some built in plastic spikes that do help. When they wear down, there is no replacing them. Avoiding rough surfaces will keep them sharp longer. It will also reduce premature wear on your metal receptacles.

Be sure to tighten your spikes before each workout and race. Remember that the most important spikes are the ones up front. The least important are the ones on the outside, back. So if you are missing one, this is the place to take it from; unless you are a supinator, in which you should take it from the inside, back. It may even be advisable for the half miler to put longer spikes in the front two receptacles.

The standard spike comes with room for seven. This is to allow you versatility in how you position them. If you pronate you want more on the inside of the spike, and can leave the one on the far back, outside, out. The opposite is true with the supinator. If you run on your toes, you might choose to leave the back ones out entirely. More than six spikes has been found to do no better than six.

When buying spiked shoes, be sure that you buy ones made for a distance runner. The primary difference is that the distance runner's spikes have a heel. The sprinters spikes have absolutely no heel since they never land on their heels. They will come with a spike key. I recommend you keep a pair of pliers or small vise scripts in your bag instead. The spike keys strip rapidly.

The last factor to consider with your spikes is the spikes themselves. It is helpful to know this: The faster the runner goes, the more power he generates and the more power he generates the more he slips. Thus the faster you go, the longer spikes you need. The 100-400 meter runner will use the longest spikes available, usually 1/2 inch. The longer the race the shorter the spikes are required. Also, the thicker the dirt, the longer spike is required. The best advice is to seek the expertise of a knowledgeable coach for which size and style to wear.

Usually needle spikes are recommended because they penetrate the surface of the dirt easily, and remove easily too. However, if the dirt is loose, it may be best to wear cones, which are bigger and will offer more surface resistance against the dirt once planted. Needles might slip in loose dirt. Rubber tracks see the smallest, and sharpest possible. We want something that will penetrate the rubber, but will only do so minimally since the rubber will not move when force is placed against it as will the dirt. Rubber tracks usually will not allow you to wear spikes longer than 1/4, and most recommend 3/16. The following is a chart with recommended spike sizes and styles depending on the track and distance.

<u>Distance</u>	<u>Hard Dirt</u>	<u>Soft Dirt</u>	<u>Loose Dirt</u>	<u>Rubber</u>	<u>Grass</u>
100 M	1/2 Needle	1/2 Needle	1/2 Cones	1/4 Pyr	1/2 Needle
200 M	1/2 Needle	1/2 Needle	1/2 Cones	1/4 Pyr	1/2 Needle
400 M	3/8 Needle	3/8 Needle	1/2 Cones	1/4 Pyr	1/2 Needle
800 M	3/8 Needle	3/8 Needle	3/8 Cones	1/4 Pyr	3/8 Needle
1600 M	3/8 Needle	3/8 Needle	3/8 Cones	3/16 Pyr	3/8 Needle
3000 M	1/4 Needle	3/8 Needle	3/8 Cones	3/16 Pyr	3/8 Needle
5000 M	1/4 Needle	1/4 Needle	1/4 Cones	3/16 Pyr	1/4 Cones

These are only suggestions. It may also be recommended for the half mile to put 1/2 inch spikes in the first two receptacles and the two miler to put 3/8 inch spikes in the front two receptacles.

Track Talk

Part of becoming a runner is learning the language. Runners have a rich language of words that pertain to their sport in particular. The following is a list of such words and what they might possibly mean in your neck of the woods.

- Adrenalin rush: When adrenaline is released into the system usually due to nervousness. We often say that the first lap of the mile is "free" due to the adrenalin rush.
- Alley: When the starter situates a track race so that 3 runners share two lanes.
- Baton: The stick passes from one runner to the next in a relay race.
- Bell lap: When the official rings the bell to signify to the racers that the leader has one lap remaining.
- Box: When a racer gets stuck in a pack with the curb on one side, a runner on the other, one behind, and one in front. He can not progress faster than the pack when boxed in.
- Break: When a runner, or pack, breaks away from the rest of the field.
- Break out: To break out from a pack, or a boxed situation.

- Burn out: A mental or physical state of needing more rest and time away from running.
- Bust a move: To take off, to take out of a pack, surge, or take the lead.
- Carbo loading: Eating a carbohydrate rich diet the days before and night before a race to ensure adequate glycogen supplies.
- Contact: Maintaining a distance close enough to one's competitors that would be considered running with them.
- Cruise: A swift pace yet not a maximal pace.
- Dipping: A sudden improvement in ones race time(s)
- Drafting: Maintaining your body in a position that will enable the person in front of you to break the wind for you and prevent him from utilizing the wind at your back.
- Dying: Falling off the pace drastically. Usually a result of mentally quitting.
- Elite: Of top quality. An elite racer is top notch.
- False start: A premature start. Usually one false start and you're out; unless the official rules crowd interference.
- Fartlek: Running unspecified bursts of speed over a cross country type terrain.
- Field: Referring to the runners in the race.
- Fly: To go all out, especially down a hill.
- Glory seeker: One who enters a heat of lesser quality in order to win.
- Gun lap: When the official fires the gun to show that there is only one lap left for the race leader.
- Hare: One who goes out too fast. Or a runner.
- Harrier: A runner.

- Heats: When a race is broken into two or more groups. Usually you are competing not only against your heat, but against the times in the other heats as well. Heats are run when there is not enough room on the track for all to safely run in the same race.
- Hitting the wall - Running out of glucose in a race. It is especially known around the 20 mile mark of a marathon when most people run short on glycogen supplies.
- Intervals: A repeat of a particular distance with a recovery period in between. Done either on a track or not.
- Jog: A considerably slow run in which the runner bounces up and down more than progresses forward.
- Kick: The final sprint of a race.
- Long steady distance. Also known as long slow distance.
- Lapped: When a runner in the same track race as you puts one lap of distance or more on you.
- Notch it: Slow down.
- Oxygen debt: The point at which the body can no longer uptake and utilize enough oxygen to fuel your metabolic energies and lactic acids begin to build rapidly.
- Pacing: The act of running even splits in a race.
- Pack: A group of runners close to each other. Often used with "the lead pack".
- Peaking: The act of physically preparing yourself so that you are most ready on a particular day.
- Pole Position: The inside lane. Not always desirable, especially if the inside lane is torn up from previous races.
- PR: Personal Record.
- PRitis: The act of looking for a PR each and every time one races. Usually makes the runner grow frustrated and doubtful of his abilities.

- Pull the rope: To drive the arms straight in front of you as in if you were pulling on a rope.
- Pull: To get in front of the pack and pick up the pace.
- Push: To physically and mentally push your body hard.
- Press: To remain extremely close to a competitor to let him know that you are there. To make him nervous.
- Qualifier: One who has qualified for the next round of competition.
- Qualifiers: Heats that are run to determine the runners who will advance to the next round of competition.
- Rabbit: A runner who either goes out too fast for his own abilities or a professional who is paid to take the field out fast in a world class race.
- Recall: When the starter fires the pistol immediately after a race start to recall the runners due to someone's false start or tripping.
- Relays: A race of any length that requires more than one runner on the team, usually four. Each runner takes his turn and passes the baton to his teammate.
- Rolling start: A sprinter attempting to roll out of the blocks as the official fires the gun. This allows him a slight, yet highly undetectable lead. Occasionally the starter will "Hold" the runners longer than normal, and the roller will pop out of his blocks before the gun.
- Second wind: A physical or mental feeling of getting more energy during a race.
- Shadow: To hang right behind another runner.
- Sit: To wait behind another runner or pack before making a move.
- Spikes: Either refers to the actual shoes, or the spike receptacles that go in them.
- Splits: Your mile, or kilometer time marks in a race. For example you might get mile splits in a marathon.

- Stagger: When runners are given a lane on the track.
- Striking distance: Maintaining such a distance behind a runner or pack that you could pick the pace up and catch them without problem.
- Stick: A relay baton. Also a word commonly used to signal to a member of a relay team to take off.
- Surging: To throw in a short, hard burst of speed in a race.
- Tangent: The shortest route possible. Often a tangent sees the runner running from curve to curve.
- The Bear: Used to describe the feeling of extreme oxygen debt.
- Track: get out of the way! Move out to the next lane.
- Waiting: Waiting for the optimal time to make a move.
- Water Fall Start: A start in which the runners line up side by side across an arced line on the track.

PRE-RACE ACTIVITIES

Race day performance ultimately depends on many variables; one such variable is the manner in which you conduct your pre-race activities. It is beneficial to establish functional habits of race preparation; thus all important aspects of race preparation will be included. Aspects of race preparation may initiate weeks, or months, in advance. For simplicity let us look at preparation for a significant race beginning one week before.

The Week Before the Race

Visualization

We tend to think of one race at a time; usually looking forward to the next. In such, visualization for one race may start upon the completion of the last. This is not to say that it couldn't begin prior. Indeed, seasonal goal races should be visualized at the onset of the season; or earlier. Visualization can be done daily, and likely should be. You don't have to do the same thing every day though. You can make some days deep visualization and some days light.

Workouts

For a seasonal goal race, the workouts should begin to taper the week before the race (see Chapter Three). For other races the week before will continue to see developmental workouts, with an easy day before and after the race. It is not necessary to take a day off before the race. A short and easy day is best. Ideally the workout the day before will mimic that of your pre-race warm up on race day. Something like the following is recommended: jog 2-5 miles, stretch thoroughly, and do a few strides, you would now be ready to race. On the pre-race day; however, only race in your mind, visualizing.

Diet

Diet the week before a goal race should utilize a process known as "carbo loading". For more information on carbo loading see chapter 19. The basic premise for carbohydrate loading is that we want to ensure that our glycogen reserves in our muscles and liver are full. Reducing our fat and protein intake the week before may prove valuable in races of considerable duration (10K or farther). Ensuring total hydration on race day actually begins several days before the race. Drinking ample fluids will benefit you on race day.

Proper hydrating is critical if heat is expected during race day. Drink water continuously, all day long, perhaps as much as 128 ounces a day during heavy training.

The Day Before the Race

Unless the race your preparing for is absolutely of no importance, an easy day is mandatory, prior to any race. As mentioned above, it is best to perform a workout that mimics your actual race day warm up. More information on the race day warm up will be presented in this chapter.

It is vital to eat a solid complex carbohydrate dinner as the main meal before the race. The traditional pre-race spaghetti dinner works nicely before morning races; and would work well as breakfast for races in the afternoon; or as lunch for races in the evening. The runner is best advised to completely avoid spicy, fatty, or new types of food, as they might not agree with your system. You are advised to consume plenty of water the day before, and to drink a twelve ounce glass before sleeping.

Sleep the night before the race is not as important as the sleep you received two nights before the race. However, make your best attempt at a regular nights sleep. An extra hour or two of sleep will help, only if it is two nights before the race; extra sleep the night before the race may leave you feeling groggy. For more information on sleep see Chapter Eleven.

It is best to prepare all of your gear the night before the race. This way you will remember everything in the morning when you are rushed. Occasionally I read a story about a world class runner forgetting to bring his racing flats to a race and having to borrow another runner's. Don't count on remembering everything in the morning. It is also advisable to lay your racing uniform, sweats, socks, and shoes out the night before the race. It is far better to discover that your racing jersey is unwashed the night before the race, than the day of. The following is a list is of items you may desire to bring to a race.

- Racing flats
- Racing uniform
- Racing socks
- Racing watch
- Bib # pinned on
- Racing sunglasses
- Training Flats
- Sweats
- Gloves
- Extra set of clothes to change into later
- Entry fee or check if not pre registered
- Safety pins (they often run out)
- Toilet paper (they always run out)
- Candy bar, for munchies
- Sports bag: to carry away free goodies
- Flyer of the race
- Directions to the race
- Towel for drying off

The Day of the Race

Awaken

The most ideal time to awaken is two hours before the race. This allows your body time to fully awaken, to restore a few nutrients before the race, to get the gastro-intestinal tract working, and to feel like you are at the top of the U in the Inverted-u hypothesis of your arousal level (see Chapter Ten under Psyching Up/Down). Awakening earlier than two hours may leave you tired when the gun goes off, especially if you had to awaken earlier than normal. Awakening much later will not allow you enough time to mentally and physically prepare for the effort.

Upon arising take a hot shower. This will awaken you and get the blood flowing. You may even wish to purposefully hit yourself with the cold water at the end of the shower; this will certainly wake you up. Then a light breakfast is in order. This light meal actually serves two important functions; the first is to satisfy your hunger, and provide a minimal amount of nourishment. Secondly, swallowing instigates peristalsis. This helps our large intestines push out excrement, contributing toward greater comfort while racing. Suggestions on what to eat the morning of the race are forthcoming. However, the point is that it takes a minimum of two hours for solid foods to be absorbed to the point that they begin to contribute toward your glycogen stores. The morning breakfast therefore should be light, to curb your appetite. A heavy breakfast, will sit heavy, and may hinder your performance.

Recommended Pre-Race Morning Foods

- Dry toast - It is light, full of carbohydrates, quick, easily digested, and will not lead to an upset stomach.
- Breads - Rolls or other breads, too, will serve the same function as toast. Just be sure that it's bread only. Pastries may sit too heavy in your stomach.
- Frozen waffles - They, too, are light and quick. They are good with a tad of syrup, butter is not recommended. Waffles tend to sit lighter than do pancakes, especially the frozen varieties.
- Peaches - They are great on top of waffles. They too are light, will absorb quickly, and are gentle to the stomach.

- Bananas - The potassium derived from a banana may help your performance (see Chapter 20). They too are light, and easy on the system.
- Water - Drink a glass as soon as you arise, and another with breakfast.
- Tea/Coffee - Caffeine has a few possible advantages to the distance runner. Namely, it's ability to mobilize free fatty acids, and to speed up transmission time between nerve synapses. These benefits are detracted a little by the diuretic nature of caffeine, but it may have more benefits than drawbacks. Tea may actually be better than coffee, not only do most varieties have the caffeine (not as much) but it contains an ingredient called theophylline which is a smooth muscle relaxer, bronchial dilator, bronchial relaxer, pulmonary blood vessel relaxer, coronary vasodilator, cardiac stimulant, cerebral stimulant, and skeletal muscle stimulator (Sheehan 1978, 212). Also, tea doesn't create the gastric problems seen with coffee, even if the coffee is decaffeinated (Sheehan, 1978, 212).
- Sports drinks - If you can stomach them, they are as beneficial before the race as they are during and after. It is often necessary to water them down twice as much as recommended to prevent them from feeling too heavy in the stomach, and to prevent nausea.
- If the race will not be run until the afternoon, then it is advisable to eat a complete meal at breakfast. This meal should be solid carbohydrates. Some examples are:
 - Spaghetti - With little sauce and plain bread.
 - Rice - Another highly complex carbohydrate food that goes well with many toppings.
 - Baked potato - Without the dressings or toppings.

At the Race

Upon arriving at the race the priority is to take care of your registration. It is always best to arrive early, and whether arriving early or not you should proceed to registration immediately. Often, especially in poorly organized races, registration takes considerable time. Getting there as early as possible makes sense, since most of the runners begin to pile into the registration lines 45-30 minutes before the race. After registering (either pre or late), and fastening your bib number to your jersey (so you don't lose it), it is time to proceed with the warm up.

The 3 S's of Warming Up

The three S's of warming up is a simple rule that I have devised to help the runner prepare for his race in a logical fashion. After registering for the race, it is time for the three S's. The first S stands for Shit, the second S stands for Stretch, and the third for Stride. Let me explain.

These three S's begin in order of importance. Emptying your bowels (and bladder) is the most important thing you can do before a race. A full bowel, is considerably more performance hindering than not warming up! Fortunately, you can kill two S's with one stone. By running your warm up away from the race start, to a bathroom, you can avoid wasting time standing in line in front of a port-a-potty.

I rarely have to wait in line for a bathroom before a race. I have been to hundreds of races, and rarely ever had to wait in a lengthy line. I always run my warm-up away from the race sight, to a bathroom. Denny's, a gas station, a public rest room, whatever. The herds of runners go to the obvious bathrooms, those big green things lined up on the sides of the road. They simply waste time standing in line.

It is also advantageous to run as much of your warm up as possible on the same course that you will actually run. If you are racing a 5K it would be ideal to jog the course as the warm up. Hopefully you will find a bathroom on the course as well. Learning the course prior to a race allows you to break the distance up in your mind. The more times you run a course, the shorter it seems. The more familiar you become with a course, the more you can tailor your strategies and tactics to it. If there are hills in the course walk them. It is permissible, and perhaps advantageous to jog slight uphill as this may serve to stretch your Achilles tendons.

If, by chance, you are in an area in which you cannot find a bathroom, run your warm up looking for one anyhow and then wait in line with the others. While you are waiting in line you can be stretching. It may be a good idea to make a quick stop at your car to put some toilet paper in your warm up suit pocket. Just in case you get to the front of the line, and there is no toilet paper left. Hide it from the other runners until you have used all you need, and then leave the rest.

It is often advisable to wear your racing flats during your warm up. Racing flats have a lower heel than do training shoes. This lower heel requires a greater stretch on the Achilles tendon. Warming up in racing flats will allow these tendons to stretch out slowly, as you run. If you were to warm up in your training shoes you might find that your

Achilles is tight, or that you do not derive as much power from them. However, when it is especially cold you may desire to warm up in your training shoes.

Now your first S is complete, congratulations you have successfully emptied your bowels and bladder. The second S requires that you stretch thoroughly. Find a soft place to stretch, some dry grass, carpet inside a building, or the back of a van. It is ideal to use PNF stretching (see Chapter 9). Utilize the same stretching routine that you always do. Doing so will ensure that you do everything required. If you are rushed and do not have time to do all your normal stretches then I recommend you stretch your calves, hams, and quads primarily. All of which can be done while waiting at the start as well.

The last S, for Stride, comes after you have warmed up well, relived yourself, stretched, removed your sweats, double tied your racing flats, and jogged to the race start. Actually the final S should be a B for build-ups. SSB just doesn't have the same ring, and is too close to SOB, which is what you say after the race! Anyhow, strides, or build-ups, serve the purpose of elevating your heart rate preparing the body for a difficult event. There is little difference between strides and build-ups. A stride is a quick acceleration to about 90 percent maximal effort for 100 meters or less. A build up is a slow acceleration of pace to a 90% effort, maintaining that effort for 20 meters or so, and a slow decrease in pace. I prefer build-ups since they are gradual and thereby present less chance of muscle injury. Strides and build-ups are not sprints, they are only intended to elevate the heart rate.

The logic behind strides or build-ups is sound. If we stand on the starting line, pulse slightly elevated due to nervousness (but otherwise normal) and the gun goes off, we find ourselves reacting. The heart must react to this sudden effort, and is delayed in doing so. This requires us to run, momentarily, in an anaerobic state, until our cardiovascular system can catch up and begin to supply the working muscles with the oxygen and glucose they need. Build-ups within two minutes or less before the race serve the function of elevating your heart rate so that when the gun goes off your cardiovascular system is one step ahead of the ensuing demands. Strides and build-ups need to be run immediately before the gun fires! It does no good to stride and then wait 10 minutes for the gun to fire. I recognize that it is not always possible to stride just moments before the gun fires; therefore, you are recommended to do 2 - 8 strides or build-ups as close to the gun fire as possible, then to take your place on the line (or in the pack) and keep moving. Space will be tight, so you won't exactly be able to jog in place, simply shake your legs vigorously, all the while remaining relaxed. When the gun fires, you will be ready.

I often see runners doing things at the starting line to prepare themselves for the race that actually hinders their performance. One classic example is when you see a runner performing vertical jumps moments before the gun. This may help reduce the runner's anxiety level, but it tightens his skeletal muscles. Jumping, is much the same as ballistic stretching (Chapter 9) in that it activates the body's Myotatic Stretch Reflex, which protects a muscle from being overstretched by contracting. Additionally, I often see runners bending down to touch their toes as if they were actually going to stretch, and then come up two seconds later. The same Myotatic Stretch Reflex is stimulated by doing such. Here lies the real problem then. What do you do while nervously standing at the starting line? It is a great time to take a few breaths, and say to yourself the cue word "relax" (see Visualization Chapter Ten) and feel a surge of relaxation run through your body.

Finally, a note of safety and consideration: take your abilities into account when you stand at that starting line. A one lane road holds about 20 runners. Look around; are you going to place in the top twenty? If not, then please move back. All too often we find runners overly anxious, and perhaps overly confident, at the start of the line where they do not belong. Not only is this a serious danger factor as 5:00 runners are screaming out, but it is also unfair to those who should be in that spot. If you belong on the front line, you will know it. If not, please be courteous.

Racing Tactics

The race goes not to the swift, but to the wise.” These words hang from my bedroom wall, serving a continual reminder as to the validity of the concept. Although our sport is often labeled a “no brainer” the truth lies far from it. Racing tactics are just one tool in the spectrum of arsenals the runner can implement to improve performance. There are opportunities to utilize tactics in every race, despite the course or distance. In fact, the longer the distance, the faster the pace, or the more obscure the course, the greater opportunity you have to use tactics.

It is crucial to understand the difference between tactics and strategies. A strategy is an overall plan one has for the upcoming race. A tactic is a single tool or maneuver utilized within that race. It's true that many tactics can be planned ahead of time and thus be included in your strategy. They are still; however, tactics. For example going out slow and picking up the pace throughout a 5K would be considered a strategy; while taking four quick steps around each corner would be a tactic. Tactical possibilities may be planned, such as taking four quick steps around a corner, or arise unexpectedly during a race. It is these, the unplanned tactics that are often the most effective.

Most runners know of few tactics and rarely use the ones that they are aware of. Most are unaware of the variety of tactics they can employ under differing racing situations. Still, some only concern themselves only with pace; disregarding all tactical awareness. Perhaps they believe tactics only necessary for the elite runners; or are not concerned with beating others. This is unfortunate for tactics can help facilitate both a better placing and a faster time. Above all, tactics add spice to racing. They give one a sense of mastery over his sport. They empower you; giving you choices to make within critically short time periods. A good tactic here can increase your lead by...while a bad one can cost you... Fortunately, most tactics are risk free. Unlike strategies the risks of tactics tend to be minimal. What could go wrong with running a tangent, avoiding a box, or keeping a wind break?

It is usually beneficial to include the tactics that you know you will be able to employ into your race strategy. These tactics tend to revolve around the course itself. However, you must be ready to discard your original plan if needed. A change of weather, time, competitors, or qualifying standards is all reasons to change your strategy and inlaying tactics. Perhaps you would normally utilize the tactic of running the crown of the road during a marathon (where there is less of a slant) and race morning brings unexpected heat and humidity. It may be better to ditch this tactic, for one of running the far side where shade from buildings exists. Your tactical awareness has paid off. *“Daring*

ideas are like chessmen moved forward; they may be beaten, but they may start a winning game." - Goethe

Wind

The race provides the fuel for your fire, the wind prevents it from burning out. For the wind is nature's varying method of ensuring that each race is unique. Work with it and you will profit, fight it and you will be defeated. For the invisible molecules that make up the atmosphere also account for 7-8% of the metabolic costs for running speeds of approximately 4:30 to 5:30 minutes per mile into still air (Cavanagh, 1990, 290). The slower you progress forward the less of your metabolic energies are spent overcoming the drag against the atmosphere. 7-8% of your metabolic energies is a great deal of energy. For example, if you could run in a vacuum (with no atmosphere) the 15:00 three miler would run (at a 7.5% saving) 13:54!

Keeping a wind break will not eliminate all of the air molecules you must push out of your way, it can, however, reduce the amount by up to 80%. This 80% reduction can be obtained by trailing one meter behind another runner, causing an energy reduction of approximately 6% according to Dr. Cavanagh. Listen to that again, you can save 6%, or run 6% faster by keeping a close wind break. Even at two meters back you still save 40% of the resistance or 3% of your total metabolic energy. Two meters is a long distance back! Still, this two meter spacing results in a 1.42 second reduction per lap on a 400 meter track (Cavanagh, 1990, 191). So know you know that you can save 3-6% by trailing another runner. However, you must also take into consideration other factors. It is theoretically pleasing for me to think that I could improve my 10K time by over a minute simply by keeping a wind break. In reality, this may not be so. Other factors do come into play. One such factor is an increase in body heat - as there is less wind to dissipate the heat. Pacing too can be affected - the breaks pace may not be perfect for you. Still, you may have to shorten your stride to prevent from tripping the guy in front of you. All considered, there is no refuting the proof that keeping a break will decrease your metabolic energy expenditures allowing you to run faster.

To serve the example I once had a 4:26 miler who thought he could easily defeat his 4:34 counterpart in still air. My runner led the way the entire race, except for the part in which he was out-kicked. He couldn't figure out why he lost, and only ran 4:30. I sat him down and explained how he could save 3% by keeping a wind break. I then showed him how this 3% = 8 seconds off his 4:30 time divided by half the time he had no wind to break on the front-stretch and you have 4 seconds. My runner simply paid the 4 second price for taking the lead, and his opponent picked up 4 seconds for not.

Thus far we have only discussed keeping a break into still air. As the wind speed grows, so do the advantages of a wind break. Determining how much you save on a windy day is a mathematically difficult matter. Dr. David Costill says that the energy cost of running at a constant speed against the wind is found to increase as the head wind increases. When someone runs on a track in calm air, the difference in oxygen uptake will increase with the cube of the running velocity. The difference in oxygen consumption can, therefore, be computed by the following equation: $V_{O_2} = 0.002 \times V^3$ where V_{O_2} is the increase in oxygen uptake in liters per minute and V is the velocity of the air in meters per second.

The following chart roughly indicates the percent increase for differing wind levels and the numbers used to come up with that percent. Keep in mind that these numbers only reflect the approximate percent increase in effort needed to maintain the same speed into the wind. They can also be utilized to determine what decrease in time would be expected for an all out effort into the wind. These numbers do not include the standard 5-8% of your metabolic energies to overcome still air resistance; simply the added head wind resistance. You will see that a 1 mile per hour head wind is reported at .0068% you must add this to the 7% required to overcome still air resistance. Thus your total wasted energy requirement to overcome the air resistance and head wind is 7.0068%.

Wind M.P.H.	Meters/Second	V_{O_2} Increase	% Effort Increase
1	.44	.00017	.0068%
2	.89	.0014	.056%
3	1.34	.0048	.192%
4	1.78	.0112	.448%
5	2.23	.022	.88%
6	2.68	.04	1.6%
7	3.12	.06	2.4%
8	3.57	.09	3.6%
9	4.02	.13	5.2%
10	4.44	.18	7.2%
11	4.91	.24	9.6%
12	5.36	.31	12.4%
13	5.81	.39	15.6%
14	6.25	.49	19.6%
15	6.70	.60	24.0%
16	7.15	.73	29.2%
17	7.59	.87	34.8%
18	8.04	1.04	41.6%
19	8.49	1.22	48.8%

Since the above percentages were calculated out at a 2.5 liter per minute rate, the percentages are accurate for a 2.5 l/min rate only. As our running velocity increases we also increase the amount of liters per minute utilized. One would find that the faster we run into the wind the slightly less we would "lose" to the wind. Of course, other factors, such as your lactate level, would increase hindering your performances.

One might think that if you lose an extra 7.2% running into a ten mile per hour head wind, then you might gain it back with the wind pushing you? Unfortunately, this doesn't hold to be true. While you are benefited for having the wind at your back, you get back only 50% of what you put into the head wind. Thus the 10 mile per hour wind would only give you a 3.6% improvement in time if were at your back the whole way (Cavanagh, 1990, 190). So a race on the track during a windy day will result in slower times. An example of this can be shown in the following manner. If we normally run a 5 minute mile on a no wind day, we can expect to run approximately a 5:19 mile into a 10 M.P.H. wind the entire mile ($5 \times 60 \times 1.072/60$) Thus we would lose 19 seconds to the wind. On a track, however, where the wind is at your back for half the race, we can expect to gain back half of that 19 seconds (8.5) and we can expect to run 5:08.5.

So the first rule of playing with the wind is to keep a wind break when the wind is at your face. The second rule is to keep a windbreak when the wind is at your back. Why? By remaining behind an opponent you will reduce your head wind by 40-80%. Then when you round the corner, or change directions to where the wind is at your back, you will be pushed by the wind - he will not. This push will give you approximately 50% of what the guy in front of you put into the wind. So you cheat off of him, and then steal from him.

The above information suggests that the ideal racing strategy for a track race, on a windy day, would be to maintain a wind break the entire way. Finding one that is running your pace and one that picks the pace up into the wind, and slows with the wind at his back would add to your advantage. All of this would serve to tire your opponent considerably, and leave you feeling relatively fresh.

Sometimes the ideal wind break is not directly behind another runner. You may be best to move to one side or the other of the runner. If the wind is at your direct right or left it would be appropriate to move to the side of your opponent. Finding the wind break is easy to do. You can detect when you are deriving maximum benefit from the break not only by your perceived effort but by the sound of the wind. Practice will help you determine the pitch differences in sound from being behind the break or not. Be sure to leave enough room to avoid being tripped and take the opportunity to focus on your opponent and let him do the mental work.

When you can not take a break into the wind, you are best to make your form as economical as possible. First off, shorten your stride. The longer you are in the air, the more the wind can push you backwards. Keeping a short stride will allow the feet to be more frequently planted to the ground. Additionally, leaning forward will help reduce your total body mass, as will pulling the arms in close to the body. It is important to maintain your head straight atop your shoulders, a 90° angle, where your head is neither bent forward or back. It is tempting to put your head down into the wind. Doing so will serve no purpose other than limiting your vision and reducing the amount of air that can pass through your thorax..

When the wind is at your back take as much advantage of it as possible. This means running tall, letting your arms come out from the side, and taking long strides allowing the wind to push you while your in the air - make yourself into a sail.

Hills

Estimates of average energy expenditures during competition are difficult to obtain. The problem inlays in trying to measure the necessary physiological responses without hindering the runner. Therefore, there have been few studies done on runners while actually racing. One exception was a Swedish study in 1972, which measured oxygen consumption of runners during a 30 kilometer race. The results revealed that the percent of Vo_2 max varied from 76%, during downhill running, to 90% uphill. During those same periods heart rates ranged from 174 and 180 beats per minute, respectively, compared to the subjects' maximal heart rate of 189 (Costill, 1986, 35). This shows a marked increase in Vo_2 requirements during uphill running, and considerably less during downhill running. It is interesting to note that in the case of downhill running the runners Vo_2 max does not correlate with the heart rate. The study did not take into account the variability of pace; though one can assume that as the grade rose the pace slowed.

Despite a runner's option to reduce pace to compensate for variations in terrain, a hilly course is more costly than a level one. In one study men ran on a 6% incline (six meters of vertical climb per 100 meters of horizontal distance) at an 8:00 per mile pace and it was found that they consumed 35% more energy than they did during level running. Running down the same grade, however, only reduced the energy demands by 24 percent (Costill, 1986, 36). This equates to a total of 11% extra energy expenditure for a course with equal uphill and downhill distances of 6% and also considering the grades are equivalent. But despite the grades hills are always deleterious to your finishing time and this loss is greater if the total altitude gained is over a long distance and the downhill steep.

Imagine a 6% incline over the first 10 miles of a marathon. The total altitude gained would be 965.4 meters. If this 965.4 meters were lost in an extremely steep downhill of 18% the total downhill distance would only be 5350 meters or about 3.25 miles. If according to the treadmill study you lost 35% energy in this 6% uphill you could expect a 6:00 minute mile pace to drop to 8:05 if constant effort were maintained. This would result in total loss of 21:00 over the 10 miles. To gain back this time we would have to run the next 5350 meters 21:00 faster. Let's say that we could run this downhill at an exaggerated 4:00 per mile pace, we would complete the down hill in just about 13 minutes. Still giving us a loss of over 17 minutes. In order for us to make up the loss we would actually have to run the 3.25 miles in a negative 3:00. In this case it is obvious that the uphill cost us greatly in terms of metabolic energies spent.

What if we were to take this situation and reverse it? Running an 18% incline for 5350 meters and then a 6% decline for ten miles. Would we expect the same time loss? No. We could expect to lose 105% (considering the 35% loss uphill is on a proportional basis to all grades which it probably is not) the grade would slow us to about 12 minutes per mile. Or a loss of 21 minutes on the uphill. Could we then gain back this 21 minutes over a 10 mile distance? To do so we would have to increase our speed from a 6:00 minute pace to a 4:00 pace. Could this be done? Absolutely not. But it is more probable than when the roles were reversed. We might even reason that we could drop to 5:15 per mile, and only lose 12:30. So we know that running uphill in a course always costs; but, a short steep uphill, followed by a lengthy downhill slope, will cost less than the other way around.

Yet there is more. One study showed that while running 8.5 miles per hour on a downhill treadmill about 17.8% energy was saved according to Vo_2 max. However, prolonged downhill running brought that number down to a 15% savings. It has been hypothesized that a combination of local muscle fatigue and damage to muscle and connective tissues during downhill running causes increased motor unit recruitment (Cavanagh, 1990, 263). Other factors for this metabolic increase may be related to the decreased stride length of the fatigued legs.

Now that you possess knowledge of hill running, you can learn to utilize them toward your advantage; because runners and coaches are largely misinformed in terms of hill running tactics. They believe in the myth of "charging hills". (Actually you may desire to apply for a runner's credit card, which typically offers an annual fee or deferred interest and the ability to pay oxygen debts at a later date). For years you would hear coaches yelling, "Charge the hills". You would typically see the runner maintaining a steady pace, hit the base of the hill and sprint up it. At the top he would experience oxygen debt and "dies". His pace then drastically slows. Other runner's easily pass. Somewhere in recent years coaches started to catch on that there was a better way of approaching the hill. They

realized that you would run faster if you remain relaxed up a hill, and put no extra effort into it than you did on the flat. Then when you approached the crest of the hill feeling relatively fresh you could increase your pace. You would catch the guy who sprinted up with ease and would immediately put distance on him.

This is only half the story. Usually after an uphill there naturally comes a downhill. Once you have passed and gained distance on your opposition you will be able to further increase that distance by flying down the hill. Why can't he fly the downhill too? Because his difficult effort up the hill has fatigued his muscles, preventing an increased stride and turnover rate. Fatigued, short strides can not extend far or rapid enough to allow maximal push from gravity. You know that when you desire to slow down while descending a hill, you take quick short strides. Your opposition is doing the same.

You now know that you can utilize hills to your tactical advantage in a race by cruising up them, moving on the top, and flying down them. However, there is more information to allow you to further distance yourself from your opponents. This advantage comes from bounding hills.

Hill bounding is a form of muscle contraction that stores the impact and returns it, much like that of a rubber ball. Bounding up a hill can save you 30% to 40% of your oxygen consumption.

Bounding up a hill will allow you to use less metabolic energy in reaching the top. For example: if our 6% grade requires 35% extra energy to maintain that pace, bounding at this same pace will save you 30-40% of that extra expenditure. Thus the uphill will only take from you about 24% extra energy as compared to the 35% of your competitors ascending at the same rate. Translate this into approximate time up a one minute hill at the same effort and you will arrive 15 seconds earlier than your opponent. Or maintain his pace and you will arrive feeling 12% fresher. Either way, you gain. You may find that it is best to transition from a normal hill style to bounding and back to utilize different muscle groups. Though this will decrease your total gain in the uphill it will allow for a longer stride and increased gains on the downhill. (for more information on bounding see chapters 4 and 8). Once you hit the downhill you should open up your stride and fly forward, using as much of gravity's help as you can. Landing on your toes will ensure that you do not put on the brakes.

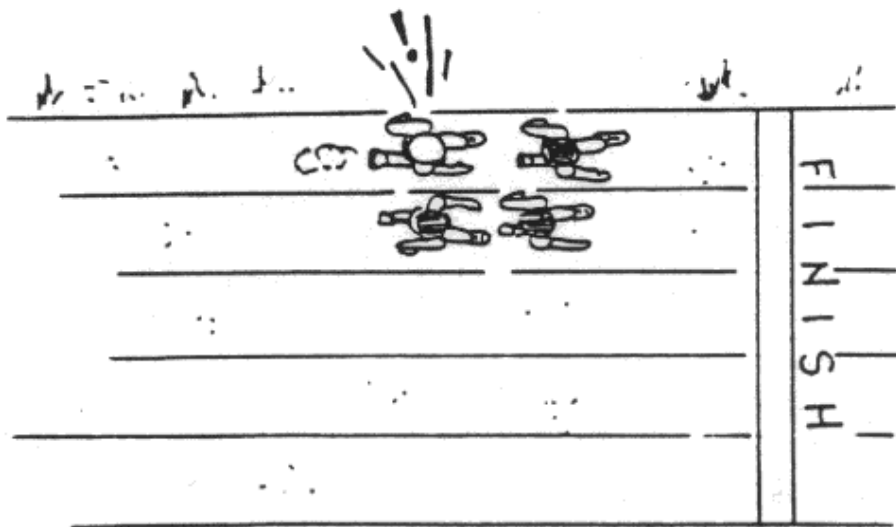
Boxing

Boxing is something that we generally think of simply in terms of avoiding, but we rarely think of utilizing them toward our advantage. First the explanation of the box. Being boxed (classically) is when you have the track's curb on your left, a runner in front of you, to the right side, and maybe one behind. Running in this position is dangerous

because you are forced to run the pace of the people around you and you can not escape the box without drastically slowing and going around, physically breaking through, or hoping an opening quickly evolves. The danger is especially high in short distance races, where it is easy to be boxed and not be able to flee in pursuit, or be able to kick into the finish.

I learned my lesson about boxes early. I was a high school sophomore half miler. My strategy was to wait until the last 100 meters and then to kick; being I knew I had the fastest kick in the field this made sense. However, I found myself in a box, unable to get out, with 100 meters to the finish. I could not escape the box. The only thing I knew to do at that time was to lean forward so that I could hope to be given the place higher than the guy to my right. I did, but still I would have placed first if I could have broken out of the box and kick past them.

Boxing in is rarely done intentionally, and always proves to be frustrating. Most often the best tactic is to avoid being boxed. To do so you are best be advised to run just off someone's shoulder, allowing you to escape if needed. For short races, you may be best to avoid running the inside lane, especially during the start. Scanning the runners ahead, and predicating what they are doing will help you avoid the box.



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If you are boxed in you need to think quick. If the race is young it may make no difference. However, if you need to get out, either because the front pack is taking off, or because you need to open up your kick; you had better get out. There are several ways to

get out of a box. The first and highly effective way is to ask. "Scoot over please" or even "I'm coming through" should work. Or you could try pointing between the guy on the right of you and the guy on the front and say "coming through". Or you may also decide that the race is early enough where you can slow down a bit, and then move to the outside. Or you can, if absolutely necessary, try a braver maneuver of either attempting to squeeze through a small space on the inside of the track and pass the runner in front of you, or pushing your way through the gap between the guy in front and at the side of you.

We rarely think of utilizing boxing as a strategy or tactic. If you see one of your opponents drafting off another on the inside lane, you can choose to pull up along side of him and remain there. Your purpose would be to prevent him from picking up the pace, pursuing a front pack, or kicking. Obviously the only reason you would want to do this would be that you were sure you could easily out-kick this opponent.

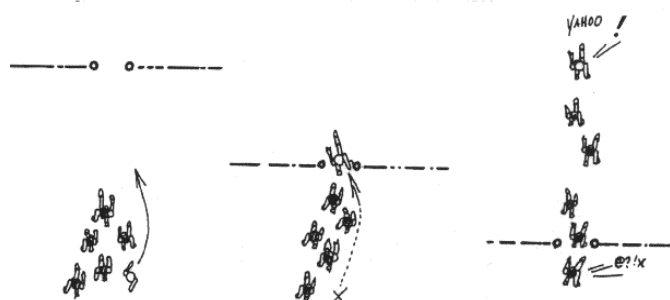
By employing this tactic you will be sacrificing something. You may not be running the desired pace you wished to, and you will be forced to run the second lane around the curves. You must make the decision as to whether the benefits outweigh the gains. If a boxed athlete requests from you to be let out; always oblige. You are attempting to utilize tactics to run smart; but use tact and be fair about it. Teams may utilize this tactic to help a teammate. For more information see Team Tactics under chapter sixteen.

The last thing to be discussed in boxing is to know that you can be boxed anywhere, anytime. You are considered boxed if you are in the middle of a pack during a marathon. Sure you will derive the benefits of being pulled along, but you will also pay the consequences of not being able to pick your path, pace, or pull out suddenly if needed. Generally, the longer the race the more of an advantage is to be gained from being boxed. It is far easier to race long distance in a box, than alone. *"It is easier to prevent bad habits than to break them"* - Ben Franklin

Gates

Sometimes, especially in cross country, you may run a race that passes through a gate or similar narrow path. Here lies both a problem and an opportunity. If you are running in a pack, or even with just two other runners, as you approach a gate you will find that the pack is broken up by the gate. Consider this, if you are in a pack of just six runners, and you approach a gate with only room for one person to pass at a time, the pack will have to stop and wait for each to pass individually. The result is a huge distance between the first and last through. If you were in the back of a 6 man pack, you may actually only be 10 meters or less from the leader; within striking distance. Once you pass through a gate, you might find yourself 40 meters or more in the rear.

While this is a great disadvantage, you may turn this force into your advantage, as you can with most obstacles. If you know of an approaching gate, you are best to slowly surge to the front of the pack, ensuring that you are the first through the gate. This will automatically give you considerable distance on the runners behind you. If you approach your surge in an inconspicuous manner, people will think little of it. You will pass without problem. It may be an error to suddenly pick up the pace, as if you were taking off, because the other runners might react by doing the same, and you may find yourself in a sprint for the gate.



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It is always toward your advantage to know a course well. In the case of gates it would allow you to take the lead of your pack before the gate is in sight, and the others would let you have it. If you are unfortunate enough to be stuck in a large pack, waiting their individual turns to pass through the gate, and you can, you may be better off to hop the gate rather than wait.

Narrow Paths and Dust

Narrow paths work in much the same manner as gates. A narrow path may only permit one runner to pass at a time. If this is the case, you want to assure yourself that you are the first through to this narrow path. This will serve two functions. First, it will automatically give you extra distance, as the others must wait to enter to the path. Secondly, it prevents you from being stuck behind a slower runner while the race in front of you runs away.

Narrow paths may also be utilized to the leaders advantage in several ways. He may choose to slow the pace down in this path, knowing that others may not pass, and he can take a short break from the intense pace. If the path is made up of fine dust, the kind that easily enters into the air; the leader can give a slight flick of his ankles as he progresses through this dirt (James Bond technique). The result will be a cloud of dust that rises to just about head height. The runners behind will often automatically back off the pace, to avoid of breathing the dust.

If you are the victim of a dust flicker, you are best to pick up the pace until you are right on his heels. This will enable you to breathe without dust interference, as the dust will hit your upper legs. It may be helpful to catch this dust flinger by running to the side of the path where there is less dust. Make sure that you do not lower your head in avoidance of the dust, this will neither keep you from breathing it or getting it in your eyes and will decrease the diameter of your thorax, thus allowing less oxygen uptake.

Breaking Their Stride and Forcing them into the Water

While this tactic is effective, it may be considered poor sportsmanship. It certainly is a tactic that is to be utilized more during cross country rather than road racing. This tactic is simple. Suppose that an opposing team member is at your left, and you notice a puddle of water or an object up-ahead on the left. Aim your route so that you pass just to the right of that object, leaving only room for yourself. If that object is a puddle, you will force your opponent to run through it. If that object is a tree or other stable object you will force your opponent to break his stride, pull in behind you and then resume normal running, and you will gain a few meters. Make this tactic unobvious. Don't push your opponent into the puddle; simply gently aim your path toward the side of the object. If your opponent pushes you over; as he is alert to the tactic, then accept the fact and abort the tactic.

If you are on the receiving side of this tactic, it is your job to ask him to move over. If he doesn't you should hold your elbow to your side and push him over; or you may elect to pick up the pace and distance yourself from him. If for some reason this tactic catches you by surprise, you have two choices of either going through the object or breaking stride. If the object is solid I highly recommend the later of the two options. If the object is a puddle of water, I recommend you usually run through it (if shallow) and stomp as hard as possible, ensuring that the guy who didn't let you over gets soaked.

Cornering

You can make distance on your opponents by learning how to take corners properly. The first trick is to accelerate through every corner and to take four quick steps after you exit each. Most runners tend to slow down through corners, and then pick up the pace to resume their original pace. Therefore, as you pick up the pace through the corners, you will not only gain the difference between your original speed and the increased speed, but you will add the distance that your opponent slowed through the curve.

Pretend that you have a twenty meter lead going into a corner, if you accelerate through it and after you may pick up 5 meters, only 3 of those yards did you pay for in terms of metabolic energy. The other two came from your opposition's slowing. If you do this corner after corner, you will gain considerable distance. Furthermore, your opponent will not detect your speed increase, as he can not see you on the other side of the corner. As he rounds the corner he will see you running with the same intensity, and will most likely not detect the few meters you gained on him. Doing this over repeated corners will allow you to pull away from an opponent without his actually realizing it; thus he will be less apt to pursue.

For sharp corners you may be best to slow down before you hit them, and then to accelerate out of them. If you don't slow down chances are you will swing far too wide. This is especially true of those dreaded turn around points.

For corners that are not as sharp you may be best to approach it in the same manner that a race car driver does. Approach the corner from the far outside, then aim toward the apex of the corner. What this does is allow you to make the curve with as little turning as possible. Practice will help you determine what the fastest form of cornering is at any given speed or slope.

"Everything comes to he who hustles while he waits" -Thomas A. Edison

Surging

Surging is simply throwing in a burst of speed somewhere in the race. It can be an effective tactic to discourage a weaker runner. It is also effective in working the kick out of a sprinter. Surging, however, is demanding on one's own body; especially if you have to break the wind as well. Without question surging is the hardest way to run a race. It makes the race that much more difficult. A surge is an increase from twenty meters to around 100. There are times when a surge should definitely be implemented. For example you should definitely surge into a head wind in order to catch a wind break if it serves toward your advantage to have a break. And you should certainly surge to weaken or discourage an opponent with a stronger kick. You can utilize surging toward your advantage when desiring to keep another runner from utilizing you as a wind break. Or you can surge out of a pack, into the lead and put distance on them.

There are times when you are absolutely advised not to surge. For example it would be futile to attempt to surge past an opponent, to round the corner and hit the wind. It would be foolish to surge past runners on the first lap of the two mile to take the lead. It would be fatal to surge up a hill when there is a long downhill following.

If you desire to surge past another runner, you may be best to wait until you detect a sign that he is tiring. Perhaps tightness in form, a momentary lapse of pace, (Pink Floyd) or a “ugghh” and then surge past him. By doing so you will be surging past him during a mental low point during his race; and chances are he will not pursue.

If you detect no sign of fatigue in your opponent then you may wish to wait until either you can observe him turning his head to look at something on one side of the road; and then passing him on the other. Or you can wait for a runner or pack of runners to pass and hop in with them, let them pull you for a while, and then drop back to your pace.

Surging in pairs is mentally devastating to another runner. You may look toward your team mate or just another runner at your side and indicate to him that you are going to take off and surge past him. When two runners pass it has more of a negative effect on the one being passed.

If you are utilizing a runner as a windbreak, and that runner attempts to drop you by surging, you are best to match his surges stride for stride. Hang right on to him, he is not only tiring from the surges, but the wind as well. If there is no wind, or it is at your back, you may decide to smooth out the surges by running a slightly faster but steady pace. Always stay with a surge during the final stages of the race.

If you are trying to lose someone in your draft by surging then you should do the following. Surge once, hard, and then resume pace. He will be expecting time before the next surge, so take advantage of this and go hard within seconds again. This provides your best chance to drop him.

Tangents and the Quickest Route Possible

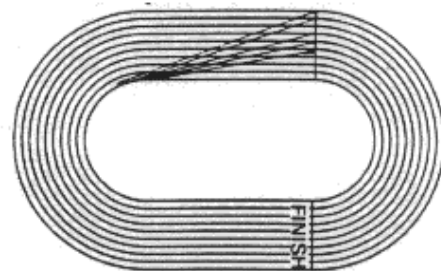
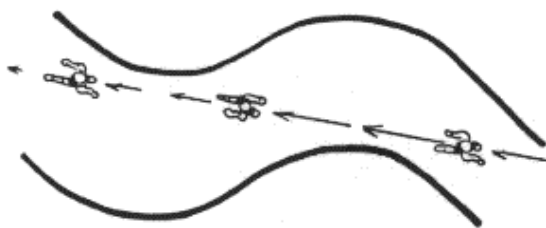
In cross country the course is the quickest route possible between markers, unless otherwise marked or indicated. Do not assume that you have to go around a tree, or stay on a path unless it is indicated to do so. Arrows do count as markers. It is the ultimate responsibility of the runner to know the course, even if it is not marked.

It's your advantage to study the course before it is raced. Look for the quickest path, which may not always be the shortest path. For example, one of the courses I frequently race, has 15 meters of a thick dirt and gravel hill, followed by 200 meters of gradual downhill dirt. You can, swing wide on the corner that leads up to the hill, where the dirt is more compact and then spend 12 meters or so extra running to the paved street on the side of the path. This does require you to run 12 meters extra, but you save perhaps

3 by running up the hill on the harder packed dirt, and then you save your 9 meters plus, by running the fast blacktop as opposed to the loose gravel.

Runners are often afraid to cut that tree, or run off the side of the road for fear of being disqualified. It should be your goal to run the absolute shortest route possible without cheating. This is not a form of minor cheating; it is simply being intelligent and finding ways to beat the course, rather than letting it beating you.

Tangents are one example of running the shortest route possible. A tangent is taking the angle that will yield the shortest route possible. For example if you were running down a street that had a succession of curves from the right to the left, you would be best to run straight down the middle of the road rather than following the curves. Running the tangents may also mean running from the apex of one curve to the apex of another.



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When racing around the track, it is usually advisable to stay to the inside lane as much as possible. Remember that you will run 18 extra feet per lap by running the second lane. For more information on the distance of tracks see chapter 12. For more information on choosing the best lane with this type of break, read chapter 15 under the 800 meters - the start. You can also save distance at the start of the 1,500, 3,000 or at the break of the half mile by running a straight line from the break to the top of the curve.

1-2-3 Go

I find it helpful, especially in cross country, for a coach or friend to stand on the top of hills, or other strategical locations and yell to you "1-2-3 go". At which point you are to break out of the pace and pick it up. Having someone else tell you when you are to move often helps you execute what you know you ought to do. Yelling "1-2-3" works better than just yelling "go" because it allows you time to prepare in your mind that you are fixing to go. My runners say it works well when they are tired. Experience has proven to

me that if I tell my runners to pick it up at the top of the hill as part of their strategy, some do and some don't, but if I stand at the top of the hill and yell "1-2-3 go" all of them pick it up. *"The next mile is the only one you really have to make"*

Catching Up

We often find ourselves in the position of having to catch another runner or pack. If there is considerable distance between you, catch slowly; unless there is a strong wind in which you may be advised to surge toward him. Set your sights on his feet. Stare at them and draw them closer to you. He will, over time, come to you. This method is more economical than surging quickly to catch.

When you have pulled him in close enough, you will find it necessary to switch your point of focus onto his butt. Otherwise, as you grow closer your head will lower in attempt to maintain that focal point on his feet and you will be decreasing the size of your thorax, reducing your air intake. Stare at his butt, and simply bring that butt toward you. As that butt grows closer, again change your point of focus to his neck, and stare at the back of his neck. Pull right up behind him, and continue to stare at that neck. Now you need to decide whether you want to stay there and rest, utilizing the windbreak, or if you desire to pass and go for another runner. *"I had now connected myself to Landy again, though he was still five yards ahead...I tried to imagine myself attached to him by some invisible cord...With each stride I drew the cord tighter and reduced his lead...I fixed myself to Landy like a shadow"* -Roger Bannister in The Four Minute Mile.

Staying Behind

Once you have caught an opponent and have decided to stay behind him you can employ a mental tactic to hold onto your position. I recommend staring at the back of his neck and visualizing a rope or a hook holding you to him. You couldn't drop off the pace if you wanted to, for you are connected to him.

The use of an affirmation will also help. Saying to yourself, "Loose and relaxed stay on his back" or "Focus on his back remain relaxed" are two useful affirmations for this situation. If the pace is intense you may also exercise mental tactics of dealing with the pain associated with that pain. You may say to yourself, "If I'm tired imagine how tired he is breaking this wind?" or "He will die any second." Still, concentrating on deep breathing and form will further your effort. For more information on dealing with pain during racing see chapter 18.

"Contact involves mental as well as physical issues. As long as a positional runner contrives to keep contact he will continue to run with threatening determination. He knows he is

still in the hunt and, while he remains so, he is capable of superhuman connection, where contact begins and ends is an abstract thing existing only in the man's own mind and the inspiration he gathers from the excitement of the moment will falter too. Doubt comes to sap his determination, to bring tension in place of relaxation, and to put the brake on high-level performance. As far as he is concerned the race is over - Franz Stampfl

Passing

Just yesterday I placed second in a ten mile race instead of third, solely because the guy I beat out passed me incorrectly. Catching up to your opponent simply is not enough, how you pass him is every bit as critical. When you pass another runner, in any race, or at any distance, you are most always best to do so with speed. If you slowly pass an opponent, he is liable to latch on behind you and break off of you. If you pass an opponent quickly chances are he will be broken and not pursue.

In the race I spoke of, my opponent had come from considerable distance to catch me at the 8 mile mark, of a ten mile race. He had to run into a head wind to do so. When he caught me he would have been best to get in behind me and take the wind break, rest a bit, then surge past me. He didn't. Rather he attempted to pass me, not only into the wind, but up a hill; up a wet hill into the wind, to be precise. There was no way he could muster enough speed to pass and break me under these circumstances. As he past, I simply said to myself, "Well what do you know, here is my ride" and I got in behind him; being much relieved at having a wind break. I rather liked the increased pace and reduced effort. Had he waited 30 meters later, he could have passed me on the crest of the hill, and broken me. I waited behind him for a mile and a half until he was wind swept, detected his pace slow a tad, and pulled out quickly, put 30 meters on an, maintained that lead.

When passing in a track race, you are most always best to avoid passing on the curve. If you must pass on the curve, do so quickly and get back into the inside lane. For more information on running the curves in track read chapter twelve, and fifteen. Always look to make sure that you have a stride and a half (about 7 feet) before cutting in.

Remember that passing is a psychologically destructive tool that you can wield on an opponent. Passing is always best when it will add additional negative impulses into your opponents head. For this reason, sometimes, depending on how you feel, you may be best to pass at a time when he does not expect it. The most optimal time is when your opponent is undergoing psychological strain. To detect this strain look for signs: a slight decrease in pace or a tightening of form. Other indicators include: looking behind, a rolling of the head, the arms rising up, not running a tangent, landing more flat footed or on the heels.

I have seen runners pass another by choosing the other side of the road. This is a psychological tool used to pass without the other runner knowing your coming, and without allowing him to utilize you as a wind break. This tool especially works if there are runners in-between you and he can not see you sneak past. In fact Rod Dixon won the 1983 New York City Marathon by using this tactic, as Geoff Smith neither saw nor heard him coming.

Pressing and Verbally Psyching

Pressing simply means to run close behind another runner. In actuality it is drafting with the exception that you are just to the side of him, and you are as close as possible. Be sure not to impede his progress by hitting him, but make sure he knows that you're there. This will often force him to grow worried, tight, he may give in.

Once you have pressed your opponent, put some added pressure onto him. Say something like, "Fun race, eh?" "Looks like a fun hill coming up" "Not so bad eh?" "Red light, your out and your out". Imagine the psychological impact of hearing someone at the 22 mile mark of a marathon say, "What an easy course eh?" Where does this guy find the energy to talk? He is much fresher than I. He must not even be working. He is going to beat me. All of a sudden this little psych game has worked. Your job is to make the other guy to think that you are better than him.

It is important to understand that it takes no extra metabolic energy to blurt a few short words. Talking is simply a matter of exhaling, with a little vocal cord interference. So feel free to talk. Just be careful about what you say. The right words can make your opponent doubt himself, the wrong words can add the extra incentive he needs to beat you.

I recall running a race in which I was standing at the starting line and another runner looked to me and said to his friend, "Look at these kids on the starting line, think there gon'na win". I was only sixteen at the time, but deserved to be there. After hearing that I was determined to beat those guys. Perhaps you could say he ate his words. The point is to pick what you say carefully, don't give someone reason to beat you. For more information on anger, and your arousal level read chapter 10 "Psyching Up/Down" and the same under chapter 13.

The Reverse Psych

Since we recognize an "aughhh!" as a sign of fatigue, you can utilize this common knowledge as a form of reverse psychology. When you desire someone to pass you and take the lead (so you can draft off of them), let out an "aughhh!" and slow a little, the

runner behind will think you're too tired to maintain the pace and will probably pass. When he does, get in behind him and draft off of him.

"If you think fishermen are the biggest liars in the world ask a runner how far he runs each day" -Alex Thien.

Puddles

Since water will add considerable weight to your shoes, you are best to avoid water as much as possible. If, however, you are forced to run through a puddle you can minimize the amount of water your shoes absorb. First speed up so that you can take fewer steps through the puddle. Speeding up will not only serve to keep your shoes drier, but you will put distance on your competitors whom tend to slow down when running through puddles.

Secondly, land flatfooted, with the foot directly under the hip. This will serve to give you the most stable landing surface. Although slipping is rare, occasionally algae or something slippery can be found underneath the water. Bring your foot down with considerable force. Literally stomp through the puddle. This will push the water out from the sides of your shoes, and allow you to pull your foot out before the water reemerges onto it. If you stomp hard enough, and pull out quickly and straight up, you can emerge from a shallow puddle virtually dry.

Lastly, it is important to pull your other foot high into the air (a prancing motion) so that the landing foot will not splash the foot in the air. Running through a puddle like this will also serve the function of thoroughly dousing the runners at the sides of and behind you. So you can utilize puddles by 1. Picking up the pace 2. Stomping through them and 3. Being the first one to the puddle so that others don't splash you.

Running Through Sand

Sand is difficult to run through, so you are best to avoid it if possible. Sand allows your heel to sink down into it, forcing you to expend considerable energy to pull it out. This also strains your calves and hamstrings. Therefore, you are best to pretend that the sand is like hot coals. First go into the sand with momentum, and attempt to keep your speed up all the way through it. Landing on the toes and rebounding quickly will help prevent you from sinking excessively into it. Keep a short stride so that you can get out quick. For more information on running through the sand see chapter seven "Running in the Sand".

Rain Racing

There are many things you can do to run faster in the rain. Wearing glasses, keeping your feet dry, and maintaining proper form are but a few. All of these factors and more have been discussed in chapter seven under “Running in and for the Cold and Rain.” Please be sure to read this if you are going to be racing in the rain.

The Road

It is best to determine on what part of the road you desire to run. There are several factors to take into consideration. The following variables should be considered.

1. Tangents - what is the shortest route possible?
2. Footing - which part of the road offers the best footing?
3. Crown - how curved is the road, where is the flattest spot?
4. Lines - the painted lines on roads are slippery.
5. Shade - where is the shade, do you need it?
6. Wind - which side of the road is better protected?
7. Cheers - the closer to them the more they feed you.
8. Opposition - where are they? Should you pass on the other side of the road?
9. Water - which side of the road will the water stops be on?
10. Cars - if they are on the course, run on the left side of the road so that you can see them coming, and make eye contact with the drivers.

When Things Get Rough

By in large running is a friendly sport, but on occasion we lower ourselves to the attitude of the football player and turn running into a contact sport. At the beginning of a race pushing and bumping is expected; especially when people are scrambling for the inside lane or the lead. Hold your elbows out to your sides to protect yourself. If somebody tries to push you from the side, he won't be able to.

Sometimes things get worse. Occasionally you may encounter a runner who is particularly physically pushy. He may continually cut you off or push you, or even punch you in the back. In this case I recommend the following steps:

1. If he violates your running space, give him a verbal warning, such as “Watch it”. If he apologizes, then chances are he is truly sorry.
2. Upon the second offense, take action and push him back! Use your elbows. Do not let him cut you off or impede your forward progress.

3. If he continues to provoke an incident, and you have given him fair warning, there may be only one thing left to do. Reach down, grab his ankle as his leg comes up, and watch him kiss the dirt. Then run like hell! I must say that rarely does a runner deserve this type of treatment. I do remember one runner whom was pushing his opponent out to the side of the track during the final meters of a mile. His opponent reacted by grabbing him by the hair and pulling him backwards to the ground. The judges' rule: The original runner was disqualified as soon as he impeded the others forward progress by pushing him to the side. Therefore the runner whom reacted by pulling him backwards cannot be disqualified since you can not commit a violation against a disqualified runner.

Falling

Should you accidentally fall, try to tuck your head into your shoulders and roll. Your natural reaction is to do as Mary Decker did during the 1984 Olympics and put your hands out. This may result in broken wrists and, at minimum, takes considerable time to arise from. By rolling you can pop back up onto your feet and resume running before you know what hit you.

If you fall, pop up and resume running. There is usually a huge adrenaline rush, and the runner who fell is hurt more by the incredible surge he throws in to regain position than by the fall. If you fall, catch back to your position slowly. Remember, that just because you fall is no reason to drop out of the race, unless you hurt yourself.

Use of the Watch

The watch may prove to be a valuable tool during distance running. The ability to know your splits may help you pace yourself over a longer distance. For example, a watch may help you from going out too fast or you may see that your last mile was too slow and pick the pace up. However, the watch is not without its drawbacks either. Occasionally we see a split and think to ourselves that the split is "too fast" we then slow to meet our more appropriate pace. In doing so you may be cheating yourself of a better performance that day. In no way am I saying to disregard what the watch says. I am simply saying that the more experienced you are at listening to your body's signals of perceived effort, the better you will be.

Knowing your splits is only one advantage of the watch. Get a watch that has a continuous countdown and pre-set splits. You can use the countdown to set it for 2:00 or 2:30 and then every time it beeps put in a surge. You can condition yourself in practice to do this in racing. Your pick ups can become an automatic, conditioned habit.

If your watch has the ability to ring at pre-set times, you can set your times to that of your desired pace. Pretend you wanted to run a 1:10:00 ten mile race. You can set your watch to beep at 7:00, 14:00, 21:00, etc.. Thus you will know, without looking at your watch, whether you are on, ahead of, or behind your desired pace.

Another feature of some watches is that of an extensive memory. My Casio watch has the ability to memorize thirty splits. This means that I don't have to remember every 400 time during a workout, or every mile split of a marathon. It may also average your splits for you. Thus you can know your average pace at the end of a race instantly. You can also use it to record the times of thirty different runs. Lastly, you can use it to help you remember what your workouts were for thirty days, since it dates them, just in case you fall behind in filling out your log book.

The most common mistake I see, regarding in the use of the watch, is when people go to stop their watch just as they hit the finish line. When you reach for your watch you slow, because your arms are no longer driving. Chances are increased that you may be passed while your fumbling for your watch. I learned my lesson during my first L.A. Marathon; I anxiously awaited the photographers' photos so I could order the one of me finishing my first marathon. Guess what? Yea, rather than seeing me drive into the finish, he caught me stopping my watch. Wow what an exciting photo. Stop your watch after you run through the finish and then subtract two seconds from your time.

The Finishing Kick

There is an erroneous myth regarding the finishing kick. "You didn't race hard enough because you had too much left at the end." To say this is not only incorrect but an insult to a runner who worked hard all the way through the line. It is, in short, chastising. You can always kick. Get up on your toes, and go. Most of the time it is simply a mental thing. I had great kicks for most all of my best races, from half mile to marathon. Are you going to tell me that the year I ran the last 6 miles of the marathon in a survival shuffle, yet mustered a kick the last 200 meters that I didn't run hard enough? Hell no. What happens is that we see the finish and grow excited, bringing about an insulin release, and we dig in, and kick. To say that the only way you ran all out is by collapsing a meter before the finish line is a joke. Yet this is what you would have to do in order to "have run the race hard enough." No, you can always kick.

To promote your finishing kick you may find it beneficial to run on your toes, then flat footed, as far back as 1/4 left in your race. This will insure speed over the last stage of the race, not just the last hundred meters. It is much the same as surging you simply run on your toes from four to ten steps, then drop back down to flat-footed. Then drive the

arms hard for four to ten steps, then push with the ankles for four to ten steps, then lift the knees for four to ten steps, then the toes again.

Once you are within kicking distance, you must decide which type of kick to use: either a jump or extended (see chapter four under "Types of kicks") then do it. You can do it, you can hold it. Remain relaxed, drive the arms, lift the knees, and above all remember that the pain of the race is nothing compared to pain of knowing what you could have done.

"For of all sad words of tongue or pen, the saddest are these: It might have been!"

-John Greenleaf Whittier

RACING STRATEGIES

Thus far this book has covered most facets of what it takes to prepare yourself, mentally and physically, to race at your highest capability. However all of this physical preparation can often be useless without a sound strategy. Strategy to a race is similar to goals for training; in that they are often necessary to perform at your pinnacle. Just as the military enters a war with an overall plan; you should enter a race with one as well.

“Perhaps the most intriguing, yet at the same time most tragic, aspect of distance running is racing strategies and tactics or the lack of them. A slight hesitance, a single step to the inside, a few seconds miscalculation of the right pace or the timing of the final kick, and any other seemingly minor error, may throw away months and years of careful preparation and sacrifice. The race is not always to either the swift or the strong, but to the clever, the skillful, and the constantly wary (Doherty, 1963, 224). The strategical and tactical possibilities in distance running are numerous. As in a game of checkers, for every move there is a counter move; for every attack there is a defense. You must possess more than Socrates' “know thyself” you must also annex “know thy opponent”. If you are to maximize the possibility of success, that is.

For the purposes of this text, it is important to understand the difference between a strategy and a tactic. Often we incorrectly use the words interchangeably. A strategy is your overall plan and of how you intend to do things. A tactic is something you employ within your strategy. A military strategy might employ tanks flanking from the West. A military tactic might deploy the tanks to utilize an unexpected train passing to hide behind. A runner might have a strategy to run an even pace for his 5K race, but may use a tactic of taking four quick steps as he passes an opponent. Thus strategies are overall general in nature; while tactics are specific components of that strategy. This chapter will deal with over-all strategy and the next with tactics.

Each race has with it a set of variables that are unique to it. There are dozens if not hundreds of variables that could be an important factor in choosing a strategy. Some obvious variables are: weather conditions, competition, and terrain. Less obvious variables might include: psychological profile of the competitors, the effect of an early fast pace on injured or fatigued runners, the effects of the home course advantage. These variables combined with dozens more can help the athlete/coach choose a strategy that optimizes chances for a favorable outcome. Thus, each race is unique and may require a particular, individualized strategy. This chapter is designed to teach you to think strategically and to learn to identify the significant variables in strategically planning. It does so through describing some of the more significant variables; such as pace and

position. It then spells out some basic race strategies for all distances. There is no magical formula to develop strategy; you must synthesize this chapter with all others to learn to effectively plan strategies.

Pacing

What it is

There is no individual element as crucial to race success as race pace. Determining what optimal pacing is, now that's the hard part. Pacing strategies are particularly more determining of the outcome in road racing and track than in cross country, where cross country the pace is often determined by the terrain. The more racing experience you have, the better judge of pace you will be. This holds true for both determining what pace is optimal and judging pace during the run. Pacing is being able to judge speed and determine whether the pace needs to be adjusted. You likely know what it is like to get overly excited and sucked into a fast first lap or mile. Similarly, you likely know what it feels like to think you are flying, running a record breaking pace, just to hear your split considerably slower than expected. We would describe these situations as "bad pacing" but what we really mean is "bad judgment of pace." As we grow experienced we learn to judge pace, and we learn to hold a desired pace; despite what others are doing around us or how we feel. It's unlikely that a beginning runner could say, "I'm going to run the first mile in 6:20" and then actually do so. He is likely to run within 30 seconds of that goal. However, an experienced runner can often tell you exactly what he is going to run and nail it to the second. So you can take two runners of equal running ability but differing pacing abilities and the experienced one is likely to win because of superior pacing, not ability.

Pacing is something that can be learned. To do so you must have a summary of your results in both training and racing. This is to say you must know an exact distance and the time you ran it in. Most high school and collegiate runners have a much better sense of pace than do road racers since they tend to do speed work under exact distances with splits. Eventually you will be able to determine your speed through your perceptual senses. We call this perceived speed. You learn to compare several variables to that of a given time. These variables include: stride length, stride frequency, effort, wind on the face, speed of things approaching, relaxation, and breathing rate. Somehow the experienced runner combines these variables and just knows the speed he is running. So to help learn pacing you now know to run exact distances under the watch. There is more.

How to Develop Pacing

Schema Theory

In order to maximize pacing skills there are two theories borrowed from kinesiology that you should be familiar with. The first is known as the schema theory (Schmidt, 1975). Schema theory holds that if you practice a task from a variety of variables you will perform better at a specific variable. For example, a basketball player who shoots x number of shots from three different distances will learn to make the free throw shot better than the player who only practices from the free throw line. This is somewhat revolutionary in thinking. We used to think that if you wanted to sink free throws you should practice from the free throw line. Now we realize that you will sink more of them if you practice from not only the line but from in front of and behind it as well.

The question then becomes whether this theory will hold true in learning pacing as well. I believe so. In fact, I tested this hypothesis. I took five runners and had them each run five quarters in 70 seconds, then five in 75, and five in 80 seconds. I took another five runners and had them run all 15 quarters in 75. After a rest period I then asked them to each run a quarter (alone) in as close to 75 seconds as they could. The group who practiced from variable paces had a mean that was closer to 75 than did the group who practiced in 75. The "so what" - practicing pacing of a variety of speeds and distances may lead to better sense of pace judgment than just one distance and one speed. This knowledge can prove useful to the runner who desires to set a pace and hold it. To further facilitate the learning of pacing one should learn how often splits should be given. We will borrow yet another term from kinesiology known as "feedback".

Feedback

The principles of feedback can be used for not only learning pacing but also for learning form or just about anything else. Feedback simply means "the knowledge of a result". For pacing, feedback is the time you ran. To properly use feedback for pacing you need to know that when we first learn something we need immediate and continual feedback. For example when you first learn to type you continually check your paper to ensure that you are doing it correctly. In later stages, after a skill is learned, it becomes automatic and feedback is not necessary. So when you first learn pacing, you need immediate and continual feedback. If your running 400's it would be beneficial to hear a 100, 200, 300 and 400 split. Thus you can make pacing changes that enable you to run your desired time.

However, the better we get at a skill the less often we should receive feedback. The runner could become very good at running the 400 in 80 because he has the 100, 200, and

300 marks to adjust. As the runner grows better he should have fewer splits. Eventually, the splits should be faded out entirely. Why? The runner may grow used to using the feedback to accomplish the skill. We call this feedback dependency. You have got to learn to use your senses - unless you check your watch every 100 meters of a race. With gradual removal of the splits (feedback) you learn to use your senses; we call this a faded feedback schedule. Still, another useful feedback is known as bandwidth feedback. In bandwidth feedback (Sherwood, 1988) the coach only gives information based on a range of correctiveness. If the performance falls within the acceptable range no feedback is given. If the split is out of the range of acceptance the runner is told so and told whether to speed up or slow down. A sample schedule is given for the optimal learning of pacing.

1. Run 400's with a split at the 100, 200, 300 and end.
2. Remove the 300 split (this way you use the early ones to establish pace then just maintain).
3. Remove the 200 split (still allowing the first one for major alterations).
4. Remove the 100.
5. Give every other 400 time after the runner begins to run consistently close to the target time.
6. Only tell the athlete that he was either within or out of a range (bandwidth feedback)..
7. Change the distance and start all over with a new one (schema). Do this for several distances.
8. Change the pace itself and repeat the whole process again (schema).

Pacing Strategies

You now know what pacing is (the ability to accurately judge speed) and you know how to develop it (faded feedback schedule and schema theory). Now you need to learn how to use it. We start with the three basic three pacing strategies and discuss their values and drawbacks. The basic three pacing strategies are: 1) going out at a slower pace and gradually increasing the speed throughout the race; 2) setting and maintaining an even pace throughout a race; 3) starting out fast, and slowing down throughout the race. Each of the basic three may have it's own particular situational advantages, and individuals may be best suited physiologically or psychologically for one of them. I will next discuss these three general strategies, and their benefits and drawbacks more closely. I will make these concepts come to life by using actual race courses that I or my team have raced before. It is often hard to discriminate between pacing and positioning, so read carefully.

Starting Slow and Increasing the Pace -The Silky Sullivan Strategy

This form of pacing is the least utilized in distance running, though it may not be the least desirable. Starting slow and increasing the pace throughout the duration of the race requires three things: patience, trust in pacing, and confidence in strategy. Patience is required in that it is often hard to stay calm and slower at the beginning of a race when everyone is hurriedly rushing out, often too fast. It also requires trust in your pacing: To know that you are running the pace you have set despite what is happening around you. It's not uncommon for some 8 year old in high tops to run the first quarter mile of a 5K in my race pace. I have to trust my pacing and not give into believing that I'm going too slowly. Finally, it requires trust in your strategy: That the runner(s) in front of you will come back. These three factors make it a hard strategy for many to follow. Often they set out with this strategy, and then abandon it in the first quarter mile.

This strategy usually doesn't prove effective in a race of two miles or less as the runner often doesn't have enough time or distance to catch the leaders. This is not to exclude this strategy from working for you in a shorter race, it's just that the risk is increased. This strategy becomes increasingly more effective as the distance of the race increases. It is a commonly utilized strategy for the marathon. As a generalization: rarely does one lead a marathon from start to finish, yet this occurs frequently in the 800. The exception to this comes in the following: If you are the one controlling the pace of the pack, then you can slow the pace down without risking your place.

The advantage of this strategy is that it allows you to physically and mentally discount the first stages of a race. Running them at a "slow" pace means they are easy miles/laps. The total effort then is made easier. If your competitors (of equal ability) are in front, running harder, they will experience more pain throughout the duration of the race. Furthermore, it is known that distance running releases natural pain killers. By increasing the effort later in a race you may allow your body time to release these chemicals making your hard effort seem easier. Additionally, they may be dealing with the stress of wondering if someone is going to catch them. They are also dealing with the question of "am I going to die?" These questions may turn into self-fulfilling prophecies. This is especially true in the later stages of a race when the faster paced runner begins to tire. Taking the first miles/laps slower will allow you to accelerate during the later stages of the race, when the lead runners are feeling fatigued. Passing them at this point could be psychologically devastating to them. This strategy works especially well when the later stages of a race are particularly difficult.

I often find the best way to illustrate strategy is to give an example of an actual racing situation. The first example comes from a well known Southern California course known as Mt. Sac. For high school races Mt. Sac puts 109 - 144 runners on a two lane road,

which merges to one lane after 100 meters. The course then proceeds with 1500 meters of flat, 700 meters of steep switch-back hills, 700 meters downhill, 200 meters flat, 150 meters of an extreme up hill, 900 meters gradual down-hill, 100 meters up-hill, 100 meters down-hill, and approximately 350 meters flat into the finish. An analysis of this course tells you that the first mile is flat, the second hilly, and the third mostly down hill. This course proves to be most ideal for a strategy of taking the pace out slow, and increasing the pace slightly the second mile, and pouring it on the third mile. This strategy works especially well since most runners are overly excited at the start, sprint for position, fly the first mile, jam the first set of hills, do decently on the first down-hill, re-gain their composure during the 200 meters of flat where people are vigorously cheering, work up the second (steepest) hill, and die on the backside where no one can see. The typical racer is dead with a mile to go.

I present each of my runners, and the team in general, the strategy of starting relatively slow, positioning themselves in the top 1/3 of the field (or top pack) and passing the mile mark feeling fresh and relaxed. Though the race leaders will have 70 meters on them, these leaders will grow fatigued as they incur some oxygen debt before the hill. The leaders will substantially increase their lactate level as they work up this first hill. I instruct my runners to bound up this first hill, putting no more effort into it as they did on the flat. Once they reach the top of the first hill, feeling as fresh as possible, they only have a mile and a half left. By now the race leaders are tiring and my runners can begin to pace others. Utilizing the down-hills by running virtually all out and maintaining a swift pace across the 200 meters of flat, they shorten the leaders distance. With the assistance of momentum, they then hit the second hill in which they once again cruise, by bounding. At the top of this hill, the two-mile mark, the race leaders are spent. Now it is time they make their move. Utilizing this next 900 meters of gradual downhill, they should emerge at the base of the last hill in the front pack. Maintaining position, despite effort, up the third hill will ensure that they are in contention to win the race. Flying the 100 meters down hill, and kicking the last 350 meters of flat, proves to be the best strategy possible on this course. Another example of utilizing this strategy comes in examining the course of the Los Angeles Marathon. Currently the course is as follows:

Miles 1-3: Gradual uphill, 126 feet total
Miles 4-7: Little change, relatively flat
Miles 7-8: Mile 7 has a steep 180 foot incline
Miles 8-10: Two downhills of 72 feet each and one of 36
Miles 11-14: Are relatively flat
Miles 15-24: Are all on a gradual down-hill
Miles 25-finish: slight to gradual uphill.

By analyzing the above data, and perhaps drawing a quick elevation map; a strategical runner will plan his race ahead of time. Analysis shows that the first few miles

are uphill. Thus it would be foolish to run them hard, especially since the beginning miles of a marathon should be the slowest anyhow. We see that miles 7-8 pose a serious hill. Thus it would be intelligent to plan to take it easy the first 8 miles of the race, until one reaches the top of the hill. From the 8th mile mark to the 23rd are all-downhill. Therefore, it makes sense to cruise the first eight miles, recover from the hill climb by utilizing the down hills through mile ten; and then beginning to pick the pace up slowly at mile eleven. Running miles 13-23 hard breaks the race into smaller, more manageable parts. I put this strategy to test running the L.A. Marathon twice, with two entirely different pacing strategies. I ran both races with the same training program.

<u>Mile</u>	<u>1989</u>	<u>1991</u>
1	5:08	5:52
5	27:52	30:08
10	57:01	59:42
13.1	1:15:08	1:17:58
20	1:57:25	1:59:04
Finish	2:45:13	2:44:51

You can see that an easier pace the early miles allowed me to wane considerably less than did a hard pace. You can also see that up through 20 miles I was lagging behind my record pace; in fact I did not catch my record pace until mile 24. The improvement came during the last two miles. During a marathon this is most often the case. Perhaps it is easiest to think of this strategy in how it applies to a marathon distance like this: There is little time difference between going out hard or easy the first miles yet there is considerable difference between struggling and dying the last few. *"You don't have to have the lead if you have the heart to come from behind."*

Going out Fast and Trying to Hold the Pace

"My whole feelings in terms of racing is that you have to be very bold. You sometimes have to be aggressive and gamble" -Bill Rodgers. This strategy is the largest gamble of the three. The risk? You take the chance of blowing up and paying for it later in the race. Should this strategy not work, and you do blow up, you will pay. There is an old adage that holds, "for every second too fast per mile you run the first half of a race you will run two seconds slower during the second half." With big risks, however, sometimes comes big rewards. In fact, most world records have been set using this strategy. For sometimes you go out hard, and simply maintain the pace. I recall watching two Kenyans (William Mutwol and Richard Chelimo) break the 5K world record at Carlsbad in 1992. At the sound of the gun the two Kenyans tore away from the elite field. As they passed through the mile mark in 4:09; a full nine seconds faster than the first mile of the previous 5K record, the announcer exclaimed, "A 4:09 mile, but I assure you it won't last." Well it did, and they broke the existing 5K world record by an astounding 14 seconds.

When you are looking for a large drop in time you most certainly have to go out hard. For example, if a 15:00 three miler tries to drop to 14:30, he would be foolish to run 5:00, 5:00, and then try to run a 4:30 closing mile. He should go out in 4:45 or 4:50. Yes, this is going out fast for a 15:00 three miler, and it's not a safe strategy - but it is necessary if you desired to take this much time off. Often a runner desires to go out fast for purely strategical purposes. Sometimes you have to get out of the pack, or be the first to a narrow path. Sometimes going out fast serves the best strategy against another runner. For example, imagine a 2:00 half miler whom has to race a 1:58 half miler. Our 2:00 runner, knows that there is no possible chance of out-kicking his competitor since his 1:58 counterpart is known to have the strongest kick in the league. Would it make sense for our 2:00 half miler to go out slow? No, the faster runner would simply wait behind him and out-kick him with ease. So our 2:00 friend knows that going out slow is out of the question. How about setting an even pace and maintaining it? Well, if he set a :30/:60/1:30/ pace it is likely that he will have a fine race around his personal record time, but will most likely be blown away in the last 150 meters and lose the race. Knowing he is up against a faster kicker, our 2:00 friend decides that the only reasonable strategy to win the race, disregarding time, is to go out hard. By setting a hard early pace, he will hope to pull the kicker with him. He is hoping that the race turns into a "who can run the fastest second lap while under extreme oxygen debt race" rather than "who can kick the fastest at the end of a slow race, race". Perhaps our 2:00 runner takes the pace out in :27 and :57, either gaining distance on his competitor which he can hope to utilize to hold him off; or, his competitor will choose to go this pace with him and increase his blood lactate level in the process. In this case, both runners are likely to run slow races, but the 2:00 runner stands more of a chance for victory than he would utilizing either of the two other basic pacing strategies.

Take a moment to notice in the last example the difference between having a plan, and not. Without a race plan this 2:00 half miler might have gone into the race with the attitude that he was not as fast as his competitor and being so was not going to win. He would have played into his competitors hands and ran his normal, evenly paced race, and lost. But having a well thought out plan gives him the hope of winning, even though he is not the faster of the two runners. It is an entirely different attitude. It is a winning attitude. The following is an account of two actual situations in which I used this strategy. In one it worked, and the other it failed. For both races, however, they were the best possible strategy.

I had a high school sophomore runner who had a previous personal record of 10:32 or so. Ben was running in our County Championship meet and I believed that he could do well. An analysis of the times of the other runner's in the race showed that there was a considerable split between the expected first pack and the second pack. Ben's strategy was

to go out as fast as the first pack did, to stay in that pack, and to let them do all the work for him. Ben did. The lead pack broke off after two laps, and Ben positioned himself right in behind the race leaders. Ben came through in 5:02, and I expected him to slow 15-20 seconds the second half. He didn't. Although three of the faster runners took off, Ben maintained position behind another runner whom was simply maintaining the pace, by utilizing the wind break, and working on maintaining the pace; Ben ran an outstanding time of 10:04. The strategy worked.

Of course, this strategy will not always work. I had a Senior 4:22 miler named Scott who advanced two meets past our league finals and found himself in a field of 4:15 milers, Scott had the 6th fastest qualifying time in the meet and needed to place fourth or better to again advance. Scott was expected to improve, but so were the other runners in the race. What strategy would work well? Going out slow? Absolutely not, he would find himself way back, and getting farther behind. How about setting and maintaining a pace? This strategy might help him run a time close to, or maybe faster than his personal record, but his goal was to advance to the next round of competition. The only available strategy was to go out with the field, establish himself in the top 1/3 of the pack, and hope for a good day. You can imagine that the field went out fast, 62 to be exact, and it came back in 2:03. Scott maintained position through 1000 meters and then began to tighten. The strategy did not work. But what else could we have done? Some say he should have run his own pace. Perhaps, but that would find him 8 seconds back, in last place, a very discouraging position to be in.

Maintaining a Set Pace

Setting and maintaining a pace is the safest of all strategies. By doing so you negate the chances of not being able to make up the time you lost by going out slow. Similarly it doesn't leave you much room for large amounts of improvement. This strategy is simply safe - guaranteed to produce a solid performance. Sometimes low risk is best. For example, if you are racing your seasonal goal race, this strategy will provide the least risk. Why train for a race all season and then chance it by going out too slow or fast? With this reduced risk comes both reduced possible bonuses and reduced possible failures. For example: if your goal was to run a 15 minute three mile race, you could set a 5 minute pace and attempt to hold it. With this strategy one of three things will happen. Either you will hit your 15 minute time, or you will feel good and increase your speed the last half mile and run slightly faster than 15 minutes, or you will cruise through the two mile mark in 10:00, fatigue and run a bit slower than 15:00. Thus you can see the effects of a lower risk strategy. Let us examine this strategy as it applies to two real racing situations.

Going into a 800 meter league race I had two runners who were favored considerably to win the league championship, and a third who I believed could place

third even though he had never run the race before. The strategy was for my two half-milers to set the pace that was the equivalent of their personal records, and to simply hold that pace throughout the duration of the race. Since they were favored to win by 6 seconds there was little risk of losing with this strategy. I knew that other runners would go out hard. I also wanted my new half miler to place third in the league, and knew that as a two-miler he could hold a steady pace, but could not handle strong surges or a fast first 200. The job of my first two half-milers was to set a steady pace, break the wind for my third half-miler, and protect him from the other runners. The gun sounded and my three runners set their exact, practiced pace, which put them in the top 1/3 of the pack after 200 meters. They passed their opposition, who went out too fast, at 300 meters and took the lead. Things turned out the way they were supposed to with a 1-2-3 placing.

While training for a marathon I decided that I was ready to break my half marathon personal record of 1:13:50. I choose a course that was flat, and had an early start time, to help with the heat. I entered the race concerned with time only, not place; therefore I would set a personal record pace and attempt to hold it. My PR pace was that of 5:38, so I decided to basically run a consistent pace: 5:40 the first few miles until I was more warmed up, 5:35 miles from there on out. I began to feel good around mile 7 and picked up the pace a bit, continuing to do so. I ended up breaking my personal record by almost two minutes running a 1:11:54. The strategy of setting a pace and holding it worked well. Notice that I did not stick to my exact original strategy. As I began to feel good in the later parts of the race, I realized that I was able to increase the pace, and I did so. A strategy is never set in stone.

Positioning

So far we have looked at the three basic pacing strategies. There is still much more to be concerned with when devising a racing strategy. Pace is only one aspect. Another important aspect is place, or your position in the race. The effects of place range from the psychological effects of being in the lead or rear, to the physical affects of being forced to run extra distances around corners. We will first look at the three basic running positions: the front-runner, the pack-man, and the sitter.

The Front Runner

The runner who takes lead of the race is known as the front runner. Each race has one, otherwise it wouldn't be much of a race. This position has many situational advantages. A prime example of this is when a superior runner desires to get away from the danger of the pack. Perhaps Mary Decker Slaney would have been best to use this strategy in the 1984 Los Angeles Olympics, rather than running with the much less talented pack and tripping over Zola Bud. There are other situations that may value

running from the front. Some feel that there exists a mental advantage in being the front runner, in hearing the roar of the crowds, seeing the pace car, having easy access to water, ease of running through gates, and the safety of not being bashed around or tripped by the pack. However, many also feel that there is an inherent disadvantage in that the front runner also can't see what's occurring behind him, can't take a wind break, can't "feed" off the other runners.

Under normal circumstances, in which the racers have near equal abilities and the wind is not a factor, the front runner generally does not win the race. "Occasionally the front runner will win the race, but usually he just sets up a fast race for the eventual winner, says Jeff Galloway. The front runner sets the pace; and if he is to be successful he must be wise in the pace he sets. Too often a runner commands the lead, feels the thrill of being in the lead, misjudges the pace, and runs too fast. Later he hits the wall, or does not have enough for the kick and he loses the race. The longer the race the more this holds true

Occasionally we see a runner break out of the pack, early in a race. People exclaim, "He is going to die", and the solo racer goes on to win. This is because leading a race is ego boosting and empowering. Unfortunately, it can also be nerve-racking. "Taking the responsibility of pace-setting, trying to break down your competition, and trying not to get jumped from behind is a stressing position", says Richard Elliot. Many times the front runner gives in as soon as he is passed by another; rather than falling in behind and resting behind the wind break. Ultimately your success as a front runner will depend as much on how you handle the stress of being the race leader as how good you are. Do you believe you can lead, and win? Are you afraid to lead? These questions ought to be explored before deciding to utilize this strategy. The use of visualization will help you learn to believe you can run from the front and win.

The Pack-Man

The pack man is the racer who utilizes the energizing value of maintaining contact with other racers. There is an indefinable, but definite advantage in running with a pack of others. You know this from solo time trials. It's rare to run a personal record alone. It is far easier to set a personal record pace and maintain it with a pack of, say six runners, than it is to attempt to do so alone. Not only does the effort seem easier in a pack, it is easier as the pack man can utilize others as a wind break. The energy costs associated with overcoming air resistance have been estimated at 7% to 8% of the total metabolic costs for middle distance running speeds (Cavanagh, 1990, 290). The pack-man may easily assess the physical status of his opponents and better judge when to make a move. The pack-man does not require the use of emotional energy in setting the pace or have as much fear as being caught from behind. Additionally, the pack-man may develop bonds of

friendship purposely constructed to help each other with their efforts. The runners within a tight pack usually become supportive of each other. They say things like, "we'll get them mates" or "come on guys hang in there." Having social support there when you need it from your fellow competitors helps you and your pack.

Like the front runner, there are trade off's for utilizing this strategy. The most obvious disadvantage is that the race leader, or leaders, could simply run away with it. For this reason it is often wise to maintain "striking distance" as best as possible. Striking distance is a feel for the knowledge that you can catch and pass with the given distance left in the race. The pack-man also lives with the danger of being boxed in and not being able to get out and go when he needs to. Of course being tripped or knocked around is always a danger too. Wise racing tactics are essential for the pack-man. Being the first through gates, running the shortest route possible, and maintaining position within the pack are all factors that need to be accounted for.

The Sitter

The sitter is the individual who either has absolute superior pacing, and can determine when to allow the race leader(s) and the front pack to pass because he knows they are setting too fast a pace, or he is the individual with the strongest kick in the field. If the first is the case, he will simply opt to choose the strategy of running a consistently paced or slower-faster race and will wait for the others to die. If he is a kicker, his job is to remain within striking distance of the leader (or some place he desires to be) and let the others do the jostling for position, the pacing, the fighting, the scrambling for the shortest route, and then he simply pulls them in over the final portion of the race and out-kicks them. The biggest problem for the kicker is staying with the leaders until the finish line is in sight. If he has dropped too far behind the pack, he may not be able to catch up

The sitter will find that the higher the quality of competition, the less this strategy will work. I had a Junior Varsity miler whom won all of his dual meet races by going out slow, thus dictating a slower over-all pace; dropping to last place, and waiting. With 300 meters to go he would perform his famous kick and pull all the runners down. Before the league preliminaries I told him that his strategy would not work. I told him that the league finals would excite everybody, the pace would go out fast and it would be a faster pace than he could catch in the kick. He did not listen. With 300 meters left, in last place, he began passing, he caught everybody in the race except the leader, whom he missed by inches. Perhaps the saddest part was the pace was a full four seconds faster than his personal record. By waiting in the pack, not the back, and then kicking, he most certainly would have won.

The Best Strategy is Often the Unexpected Strategy

If you are a well prepared runner, you will have a minimum of the three basic strategies available to you. Many times you may be the controller of the race and sometimes you can not. Being prepared to change your strategy is essential. Yes you can get by on just one strategy in many circumstances. Let us say that you are running a marathon simply for time; you should devise the best strategy for yourself for that day, and that particular course bearing in mind your strengths and weaknesses. On the other hand, if you are trying to win that marathon you had better have many plans for “what to do if” and have studied them well. You must be able to react intuitively to the situation as it happens. Having several strategies will allow you to do so.

Sometimes using the same strategy over and over will allow your opponents to know what you are going to do, and they can count on you doing so again. You may want to keep your opponents on edge by diversifying your strategies. On the other hand if your opponent is one of those runners (and there are many) whom utilize absolutely no strategy in their racing, you can use the same strategy over and over on him, and it will work over and over.

Creating A Strategy

Thus far you have learned the primary variable of pacing in strategical racing. You then read about positioning within a race. Learning to combine these two variables with the dozens of others that affect a race is more of an art than a science. There are so many variables that need to be taken into account before developing a plan of action. Analyzing these factors, and the many more that are situationally and personally unique, will help you determine what the best strategy is for you at that distance on that day.

1. What pacing would work best for me?

How does the length of the race play a role?
Are there hills, heat or humidity to be factored in?
How about my competition, where will he be?
Is my level of conditioning a factor?
Does the course influence this decision?

4. Are there hills in the course?

Will I need to have rested before them?
How will my competition run them?
Will I need to have a lead before I get to them?

2. What running position would best suit me?

Which position best suits my pace?
Where will my competition be?
Do paths, gates, or other features play a role?
Where is the wind, and to what severity?
Will I need to get a break from the heat?

5. When do you expect a pack split?

Where will you need to be?
Where will the kickers be?
Will the pack split at all?

3. What will the start be like?

How large is the starting line?
How fast will the start be?
Will I need to break away early?
Where should I be on the line?

6. How do these factor in?

Heat, Hills, Humidity, or wind?
Tangents, quality of terrain, obstacles?

Racing the 800 Meters

The 800 has been the sight of one of most exciting battles between two classes of runners: the distance runners and the sprinters. The sprinters primarily come from quarter milers turned half; and the distance runners from the milers turned half. The sprinters tend to be tall (6 foot and over), with strong legs and upper bodies. The distance runners tend to be shorter (under six foot) lighter, and more economical. To be elite at this distance you must have most of the speed of a quarter-miler and much of the endurance of the distance runner. Additionally, you must possess the ability for quick recovery to make it through qualifying rounds; since only 8 or 9 can fairly race this distance on the track.

The result of the requirements for this distance make possible the great battles between the sprinters (the kickers) and the distance runners (the non-kickers). It proves to be one of the most strategical and tactical running events. It is quick, and there is little time to make up for a misjudgment or strategical error. It is rough with jostling, pushing, cutting, and boxing. The distance between first and last place is often short, the pace swift, and the kicks strong.

We will now begin discussing some of the strategy you can employ during the half mile race. There are, of course, more strategies possible than can be discussed. The particulars of each and every race, for each athlete are what should determine what strategy is used. No book is as valuable as a wise coach versed in the complicated ways of the half-mile.

The Start through 200 Meters

There exists a few trade offs in the lane assignments. First of all, the farther out you are the less chance you have of the race collapsing in on you and the better you can pick your spot in the pack. However, the trade off is in not being able to see the pace that the other runners are going out in, and therefore not being able to judge the pace you need to go out in to properly position yourself in the pack. The trade off is almost equal, and therefore the advantages and disadvantages of each lane should cross each other out and, in this sense, it makes virtually no difference which lane you choose.

Another trade off comes in the fact that the inside lane is the only lane that runs 800 meters; the others run farther. You see the disadvantages for lanes 2-9 grow worse with each lane. While it's true that the stagger for the 800 puts all runners at the break line in 100 meters; the bigger your lane number the farther back in toward the first lane you will have to run after the break. Now if you run from the break to the apex of the curve the extra distance is negligible. The Pythagorean theory holds that $A^2 + B^2 = C^2$ and from lane 9 you will run only approximately 18 inches farther. However, if you cut in right after the break you may run up to four feet farther. So if you get an outside lane just be sure to run a straight line to the 200 meter mark. On the other hand, the farther out you are in your lane assignment the narrower the curve you have to run for the first 100 meters. Lane 1 has the sharpest curve, while lane 9 has the least sharp. The sharper the curve the more you slow. Thus you can see that this trade off works out evenly.

The start of the half-mile is always fast. It is run in lanes and you are allowed to cut in after the first 100 meters or after the first curve. Thus, most everybody runs the first 100 meters hard, trying to insure themselves a descent spot after the break. Usually, if you plan on winning you need to establish yourself in the top four runners after the break (not a rule). This means you will have to run the first 100 meters hard. After establishing your position off the corner, decelerate to racing pace.

It is easy to be swept away into an overly fast first 200 meters. This may leave the distance runner (non-kicker) extremely fatigued during the second lap; and will cause even more damage to the sprinter (kicker). Thus it already appears obvious that the non-kicker may prosper from taking the pace out hard, attempting to burn the kicker out. You will find this the prime strategy of the non-kicker.

Having to run the inside lane from the 100 to 200 meters mark may be a disadvantage. As the runners come off of the break, they jet for the inside lane. The runner on the inside lane can easily run straight into a box with a runner in front, one at the side, and one behind. Once boxed in, you have no way of getting out to command the lead, move with a surge from the runners in front, or run your desired pace. To prevent from being boxed, the runner in lane one is best advised to either 1) accelerate around the first 100 meters, assuring the lead when he rolls off the turn; or 2) he should move into lane one and a half or two after the break. This way the runners will move in front and behind of him, but will not run on the right of him. If somebody does come on to your right you still have an escape route. You then have the 200 to 400 meter mark to get to the inside. The danger of choosing the second method is that you may not find a spot to move in and thus be forced to run the outside second corner, or even the third curve. The danger of choosing the first method obviously is in pacing and the possibility of going out too hard. For these reasons the kicker is at a particular disadvantage when positioned on

the inside lane; for he may only choose option two and may not be able to pull into the inside lane before the corner. The disadvantages don't end here. The first lane is also the most chewed up lane on the track and, especially on a dirt track, may make the footing worse.

The Second Curve

Usually by the 200 meter mark positions have been somewhat established; occasionally, though, you will see someone running hard around the second curve still attempting to gain their desired position. It is helpful to know that it is not necessarily a sin to run the second lane off the second corner. It is always advantageous to run the shortest route possible when you can; however, it may still be best to run a half lane out to prevent being boxed in. This however, is one of the few times when it is acceptable to run the curve in an outside lane.

As positions are apt to remain constant around the second turn, the war begins to take place. The kickers know that the slower the pace goes the better chance they will have to win. The non-kickers know that the only way they can win is to have enough distance on the kickers so that they cannot be caught, or to set a fast enough pace to burn the kick out of them. So we generally find the non-kickers beginning to increase the pace around the second curve. This strategy works particularly well since chances are the non-kicker has commanded the lead. This also helps prevent the non-kicker from being boxed in. The kicker needs to avoid the box so that when his time comes to pursue, he may.

The Front Stretch

Down the front stretch the non-kicker will maintain the accelerated pace. He will most always run negative splits, meaning that his first lap will be faster than the second. In fact an analysis of World Records and Olympic Champions between 1948 and 1963 shows that every race, without exception, had a faster first half and only three races had a time difference of two seconds or less between the laps. The average 440 was 52.3 and the second 440 was 55.1 (Doherty, 1963, 235). On the front stretch the kicker must decide to either hang directly behind the non-kicker and take advantage of the wind break, or allow the non-kicker to go, simply maintaining striking distance. The advantage of taking the non-kicker as a wind break is that the kicker can save 3% - 6% of his metabolic energies by maintaining a wind break (Cavanagh, 1990, 290). The disadvantage is that the pace may prove to be too fast, burning the kick out of the kicker. Moreover, the advantage of letting the non-kicker go is that the kicker may utilize another runner as a wind break, and catch the non-kicker in the end. While a disadvantage of letting the non-kicker go is that he may never catch him, especially if the kicker gets boxed up.

The cheering on the front stretch is often great. The fans are excited as the race passes with great speed before them. It is an apprehensive time as the race is still totally unpredictable. They yell for their favorites, and though this can help with your motivation, it may also become confusing. The cheering may push you along into too fast a pace, or it may divert your attention as another passes you. Therefore, it is important to maintain concentration. The 800 is simply too short to lose concentration. Remember you are not half way done yet. It still is too early to make big moves. Accelerations in pace at this point should be subtle, since the race is young. Oxygen debt before the 400 meter mark will prove fatal.

While the pace is best consistent at this point in the race, if you judge that at your current pace you will need to pass the runner in front of you by the end of the third curve, you are best to slightly increase the pace, pass this individual before the curve, and maintain pace after. The passed runner will either pick up the pace, preventing you from passing and forcing you to run the outside lane, or he will allow you to pass and may or may not later try to repass. If he does try to repass you, force him to run the outside lane. When passing another runner before the third curve, you are best to do so quickly, so that the chances of him pushing you to the outside on the corner are lessened. Should he accelerate as you do, get back in behind him and wait until after the third corner - it's not worth running the second lane at this pace.

The Third Curve

Not much should happen during the third curve of the race. Ideally you have your desired position, and definitely the inside lane. The pace is best simply maintained, with no increases in velocity. You can use tactics at this point, like slowly transitioning to head wind form, or mental tactics of dealing with the pain, but rarely should a move be made now. It is foolish to pass on this curve, you will work hard to pass, and then (most likely) be forced to take to the wind. How do I know that the backstretch is the windy one? Because tracks are designed so that the 100 meter races are run with the wind at the back, on the home side. Thus, most tracks find the wind on the backstretch. This wind makes the backstretch (300 meters left) a difficult part of the race.

300 Meters Left

Now the race begins! The non-kicker has done his best job to distance himself from the kicker. The kicker has tried to maintain contact as close as possible without burning himself out. Now, into the wind, the non-kicker takes advantage of his smaller frame and endurance to begin his version of a 300 meter extended kick (a jump kick might prove deadly). He picks the pace up, passes others before the curve. He attempts to distance

himself as much as possible, judging his efforts appropriately to allow him to finish without hitting the wall. Of course, the kicker must try to catch him. This may mean that he starts moving, or most likely he tries to grab a wind break for this backstretch, and will wait until just before the curve to move. The non-kicker passes anybody needed to have the inside lane going into the final curve. The kicker too should insure himself of the inside lane going into the curve. The kicker usually can not utilize an extended kick effectively. He must usually decide when to, and execute, a jump kick. The kicker may jump with anywhere from 100-300 meters left. This backstretch is generally where the race is won. The question becomes, "Did the non-kicker run hard enough, and have enough left to hold off the kicker"? The answer will most likely be told in a thrilling final 100 meters.

The Final Curve and Kick

It is imperative to pass whomever you must to establish that inside lane for this final curve. You are simply too fatigued to run the outside lane, unless the runner in front of you is going your pace or faster, pass before the curve. Once you are into the curve you hope that you will not have to pass. If you find yourself approaching another runner, you have a critical, often race deciding decision to make. Do you attempt to pass on the outside lane, running at this high speed, or wait?

Many times I have seen the approaching runner catching a slower runner on this last curve, he decides to pass, moves to the second lane where he expends considerably more energy, and then not be able to pass stays in the second lane. Now he is going all-out, and not passing. He then drops back in behind, finds he has made a fatal mistake, doesn't have enough to pick it up again, and is caught from behind or beat by the guy he was trying to pass.

If you are going to pass, and sometimes you must (especially to hold off the ensuing kicker) it is imperative to pass quickly, and then pop back in to the inside lane. If you can't, your best off to wait until just before the end of the curve, and then to begin rolling out toward the second or perhaps third lane, pass the runner and continue to run straight. After rolling out from the final curve do not return to the inside lane. It would be foolish to run the distance from this second or third lane to the inside lane. Not only does it add distance to the finish line, but the inside lane is more chewed up slowing you, and you could get boxed in. It is OK to finish the race from any lane. If another runner passes you, go with him, but position yourself on the side of him as to avoid being boxed in.

The final 100 meters is simply all out. However, "all out" to the kicker and non-kicker are two totally different things. This is where the kicker's advantage comes in. If he has successfully maintained a conservative pace, utilized wind breaks, taken the inside

lanes, and maintained striking distance on his opponent, he will kick, catch, and win the race. However, if he didn't take a break, was forced to run the corners, or lost contact with the leader, his powerful kick may fail to bring him the victory.

Being the last 100 meters are an all out sprint, you need to use sprinting form. You should be on your toes (actually your most likely on your toes 90% or more of the race anyhow) driving the arms, lifting the knees, all while remaining relaxed. You should run through the line. Remember that the judges are likely to give a close call to the runner coming from behind, because the judge's eyes are on the chaser.

The Mile - or 1500 meters

The mile is the most celebrated of all the track events. What makes this distance so special? The four-minute mile. Every runner, fan, or knave knows of the four minute mile. We know it to be one of the previously conceived barriers that could never be broken. The mile, along with manned flight, the sound barrier, and space travel, are all testaments to what man can do when he believes he can. Why are people so fascinated with this four minute barrier." Perhaps part is due to our obsession with round numbers. What could be more simply elegant than one mile of four laps in four minutes? The mile is also a distance that most anybody can do, and relate his performance to the best", says Roger Bannister.

There is sheer excitement in sitting at a professional track meet during the mile. The crowd rarely knows who is who in the race, and usually doesn't care. Only the distance runners are versed in the specifics of who's who, and who has done what. Everybody else simply wants to see somebody break the four minute mile. The evenness of the splits allows the youngest fan to understand that a 60 flat quarter is the pace required to break the 4:00 mile. Most always the pace comes through under 60 and the fans start to stir. When the runners pass through in 2:00 or just under, the fans begin to grow restless, chanting for whomever is in the lead. 3:00 sees people standing, yelling, desperately hoping to see that magic mark broken. As the lead runners barrel down the straight-away, the fans hearts pound in synchronicity with the racers, our adrenaline is as great, and we want something almost as bad as they do. The fans and racers work together, to benefit all. The cheers grow deafening as the leader brakes the tape somewhere around 4:00. If he does it, if he breaks four minutes; hysteria erupts! Yet .01 second difference can bring scours of sighs. Yes the mile is what makes the track meet. It is sad that we are seeing the mile being replaced with the 1500 meter. The 1500 meter is only 100 meters shorter, it is 100 times less exciting!

Sir Roger Bannister was the man whom first broke this four minute barrier. To know and understand how the barrier was broken would require having been with

Bannister during the weeks prior to his run; to have suffered his pangs of uncertainty about his personal condition and the weather; to have heard the Iffley stadium announcement: "Result of the mile...time, 3 minutes..." and to drown out the rest in your yells of sheer excitement. "It was a fight for self control, Bannister against Bannister, a fight for restraint and relaxation, for will-power greater than the dragging anchors of fatigue, all exaggerated by the absence of important competition, except for the stop watches. Bannister had no one to be aware of but himself; nothing to think about except the enormity of what he was attempting", says Kenneth Doherty.

In addition to the richest history in running, the mile provides one of the most exciting races available. It is perhaps the height of tactical racing. It requires great deals of both speed and endurance. It is too far for the sprinter, which makes it a grueling race for the runners, since they all possess the quality of endurance. This fact makes for tight packs, tactical moves, and blazing finishes. It is long enough to provide ample time of action to the spectator without him being able to lose count of the laps.

The Start

Depending on how many runners are entered in the mile, your start may vary. For a mile on the track, eight racers are plenty for an exciting race, yet it is more common to see 10-12 lined up. It is also not unheard of to have 20-30 racers in a single mile race. Your strategy may vary depending on how many runners are lined up. If there are eight or less on the line, the starter may elect to use the same start as in the half mile. If this is the case you need to read about the start of the half mile as there are many complexities and inequalities with the various lanes. With anywhere from nine to approximately twenty runners in a mile, a waterfall start (where you line up shoulder to shoulder curved toward the outside of the track) may be used. This start will create considerable jockeying for position the first 50 meters or so and then things will settle.

The latest start is known as an alley start. This start is used with larger numbers. It places three groups of runners in three positions: lanes 1,2,3 comprises one alley, then several meters ahead another group of runners in lanes 4,5,6 and again another in 7,8,9. This start is the only one that does not offer the same distance around the corner to all runners. There is a disadvantage to being on the outside pack of one of these alleys; for you are forced to run farther than the men on the inside of your alley. I.E. running around the curve from lane 3 is farther than from lane 1.

The number of racers will also give you an idea of how fast you must go out. If there are only eight runners in the race chances are the start will be slower, as the racers know that only eight runners will always allow you to position yourself within striking distance of the leader. Thirty runners; however, is a different manner. The racers know

that some will be forced to the back of the pack, some to the far outside lanes, none of which anybody wants. The result is a mad 150-200 meter scramble for position.

In the case of such a mad start, it is crucial to keep your elbows out to your side to protect yourself from the others. You too must take off with considerable velocity if you wish to be in the race. The mile is long enough to allow some time to catch, but not much. If you plan on winning, you are likely better off in the top 1/3rd at the start. Though it is not unheard of for a racer to take last off the first corner and then to come back. In the Melbourne Olympics Ron Delany took last place at the gun. The pack was large; 37 Olympic caliber runners, 12 of whom had already beaten the Olympic record. Delany won because of superior pacing and a supreme kick. He ran his last lap in 53.8 and the final 100 meters in 12.9! For someone with a kick like this, it may be OK to wait a while.

The First Lap

The first lap of the mile is always tight; nobody wants to get out of the race during the first lap. Whomever takes the lead off the first curve will most likely be deemed the pace setter. If he goes hard, the pack will as well. Should he run slow, the race will become more of a tactical one. It is precisely for this reason that big meets hire rabbits; they take the pack out fast. This tends to keep the fans happy since they are more interested in a fast race than a tactical one.

Knowing this, the runner with a strong kick may be advised to take the lead on the first lap, and to set a slower pace. If the others follow, he will be setting himself up to win with a kick at the end. This strategy will usually work until just before entering the second lap when others might get anxious and pass. If they do, the kicker simply needs to pick up the pace a little, to hold them off into the outside lane, and make them run that extra distance. Once they hit the backstretch he should let them in and take the wind break.

The miler without a strong kick should know that he can not tolerate a slow pace the first lap. He knows that he must put some distance on the field to prosper. Unfortunately for him, this often means passing people on the second curve (200-300) and the third curve (400-500) if he doesn't get out quick enough. Not having the sheer leg speed of the kickers he may not get out quick enough to establish the lead or a spot in the top. Thus, he is forced to play catch up that first lap.

Generally the first lap of the mile is one of the fastest. The race leaders will most always run the first half faster than the second. Though this does not mean that it is the best strategy. This fast first lap usually occurs from the jockeying for position. We often find, at all levels, the leader of the race at the first lap is not going to be the eventual winner.

The Second Lap

During the second lap the pace settles down into race pace. It is advantageous to establish an inside lane position going into the curve of the second lap. You may also prepare to take a wind break ahead of time by locating and getting behind your desired break. Work on relaxation, there is a long ways to go. However, you must stay alert! The race is going to split at any time. Avoid being boxed in, and if you do get boxed in, get out as soon as possible. If you see the split while you are boxed in, you may have to break out.

The pack will most always stay together the first lap, it will become more strung out as people take to the inside lane going into the second, yet still be fairly tight. Sometime between the backstretch and the front-stretch of the second lap the pack will split. There will be a quick division of the first pack and the second pack. You must be aware of this split, and move before it happens. It is always better to be in the back of the first pack, than the front of the second. Not seeing the pack split, and failing to react to it can cost you the race. The energy you will have to expel to catch the front pack, alone, into the wind, will leave you dead once you do catch. As soon as you detect a split happening somewhere in that race, pick up the pace and get into that top pack (if you belong there). Perhaps you will be lucky enough to be in there anyhow; but if not, keep a sharp eye out for it.

Usually the leader of the race going into the second lap will not be the eventual winner. Most often, the winner will be stationed from 2nd to 5th place at this point. This early leader often expends much of his energy breaking the wind and setting the pace only to be passed. Knowing this, you may decide to avoid taking the lead in the second lap, and to hang a few runners back, keeping more of a consistent pace, and a wind break. Should you see the split, get out, around, and to it. Should the split occur on the far corner of the second lap (600-700) get out and run the second lane, until you pass the person who lost contact, and get into to that pack.

During the front-stretch of the second lap the front pack usually pulls away from the second pack. Occasionally the split occurs here; but usually it takes place on the backstretch or curve of the second lap. Now the race is divided into two separate races. Those that are going for the win, and those that don't stand a chance.

The Third Lap

This lap is the toughest of them all. As the runners pass through the half-way mark, and make their way into the third lap, they are feeling quite fatigued. They say to themselves, "My God only half-way down." They let their pace lapse, since the finish seems so far away. In reality, it is not. For as soon as this third lap is complete the race is

only a lap from over. Knowing this, take advantage from it by making the third lap one of your fastest. You always want to speed up when your opponents slow down and in the case of the mile, the third lap is the place. The problem is this. In order to do so you may have to either take the lead, or at least pass others into the wind. Accelerating with 50 meters before the third lap, to pass a few of the runners in the top pack, will serve you well. You will be passing them with the wind at your back, and will not be forced to pass on the curve or windy backstretch. Tracks are designed so that the prevailing winds are pushing the sprinters down the front stretch. Additionally, the top pack usually splits again with around 600 meters left in the race; and you want to be in front of that split.

On the backstretch of the third lap, remain relaxed; although you are straining to push this lap as best you can. Ideally, you would like to have a wind break that is also running your pace. If you desire to be the eventual race winner then you should probably be in the top three individuals right now. Or if there is still a pack, you should be in the lead pack.

Depending on your abilities, you may decide to begin your final push as early as 500 meters. If you are particularly strong, then you are best to begin your final drive with 500 meters left. Pass your opponents as you roll off the curve, and use the wind on the backstretch to push you. Head into the last lap with the lead, and drive all the way home. Or if you are not this endurance oriented, you may decide to wait until as late as the last 100 meters. In this case you are best to keep a wind break behind the lead runner, or second position runner, throughout this third lap, and wait.

The Final Lap

If you possess endurance and strength, you are best to catch the others off guard, and in a moment of mental drainage by suddenly taking off with 500 meters to go. If you possess some strength, and little speed, you are best to take off going into the fourth lap. Hopefully, the guy with the kick will have to pass someone on the outside of the curve to go after you. If you are a real kicker, then as usual you are best to wait, until you have perhaps 200 meters, or even 100 meters left in the race.

The final lap is usually about as fast as the first lap; although the effort is considerably greater. It is important to work on proper mechanics. You should be on your toes, with a forward lean, driving your arms and lifting your knees. As you roll off the last corner with 100 meters left, roll out an extra foot, the footing is usually better here since it is not as chewed up. Drive all the way through the line, and never give in. Despite your current place, never give in. You never know what might happen those final meters. *"The speed of the leader determines the rate of the pack"* - *Simple Mile Strategies*.

- Take off the first 100 meters to establish the lead, then slow down and set a slow pace for the first two laps. Take off hard and surge the entire third lap. Hope the distance you built is enough to hold the others off by having mentally discouraged them.
- Get behind your opponent and let him lead for the first two and 3/4 laps, then take off with the wind at your back, surge hard and put considerable distance on him. Hold him off the last lap.
- Run as evenly a paced mile as you can and hope that your pacing abilities are faster than anyone else can run.
- Take the lead and set a slow pace, every time your opponent tries to pass, pick up the pace a little, hold him off on the curves and force him to run the outside lane, tiring him.
- Maintain a wind break for 1500 meters behind the leader, whomever it may be, and switch to the new leader should someone pass, out-kick him with 100 meters left.
- If there is no wind, run a hard first lap, and hope that the distance gained is sufficient to hold the rest off.
- If the pack goes out fast, take to the back, run a consistent pace, and stay clear of the jostling. As they tire from their fast early pace over the third and fourth laps pass them all.

If the mile race fascinates you as much as it does me, I recommend you purchase *The Milers* by Corder Nelson and Roberto Quercetani. It is a Track and Field News Publication. The address is listed in the beginning of chapter five. It details the history of the mile; and proves to be fascinating reading.

The Two Mile - or 3,000 meters

Until the mid 1950's the two mile race was the farthest scheduled race on the track. It used to be considered a long distance event, we now consider it a short distance race, or middle distance race. This race requires a great deal more endurance than the half mile or mile. For the high school athlete, the two mile race is the farthest distance run during the track season. The high school runner whom is used to running the three mile, may find moving down to the two mile exhilarating, as the pace is increased, the miles seem to go by quick. For the half-miler, or miler moving up, the laps may seem longer. The two mile race is the first race in which the kicker is generally at the disadvantage because he simply

does not possess enough endurance to maintain the pace with the non-kickers for this duration. The two mile is the first race in which only distance runners compete.

The Start

The start of the two-mile is nowhere as hurried as is the start of the half or the mile. Though a two mile race will often have 10-40 runners, there is plenty of time to acquire position. There may be a slight rush for position in the first 50 meters or so and this is normal. If you plan on winning the race, you too may want to rush out, and establish position within the top one third of the field.

Once you have established position, it is important to begin working on pace and relaxation. It is easy to get swept into picking the pace up to catch your position, and to maintain this accelerated pace for the first lap. Doing so will certainly leave you feeling dead in the later stages of the race. You want to try to get a position as close to the inside as possible and to avoid running the curves. If you are forced to run the first or even second curve, don't fret, simply find your inside lane position on the straight-away.

While I have mentioned that you desire to locate yourself in the top 1/3 of the field as soon as possible, there is no real rush to do so. It is perfectly acceptable to hang back for a few laps, and then move into position. The entire field tends to stay together for 2-3 laps, and the lead position is always within striking distance. It is futile to lead at this point unless you know that you are far superior to your opponents and wish to get away from them.

The Split

Somewhere between the second and third lap, the field is likely to begin to split into packs. Like racing in the mile, you want to be alert for this split. If you desire to be the eventual race winner you have to be in the back of the first pack, at minimum. Unless; of course, the front pack is simply running much too fast and you know they will come back to you.

This split may occur at any time, the third lap is simply the most likely. When it happens it does so quickly. You see the runners spread out into a train, and then boom, it hits. If you see it from the rear you must immediately move out from the person you are following, and slightly accelerate to get into the back of the lead pack. Or you may be fortunate enough to already be situated in this position as it is. In this case the split would happen behind you and you would know nothing of it. The danger in not seeing the split comes from the ease of being carried away with the rhythm of the race and not realizing that the field is splitting into two. You suddenly look up and the front pack is gone. You

are then forced to catch them, alone, without the aid of a wind break. Generally the runner whom finds himself catching the pack will do so around the 5th or 6th laps, and then he will be too tired to take off when the pack does. As soon as the pack splits the pace will probably begin to pick up, or the others slow down. You will leave the second pack behind. It is crucial to work on relaxation during these laps.

The First Half

The first half of the race usually is run in even splits, or the first mile being slightly faster than the second. A faster first half mile of up to fifteen seconds is normal. If, however, the first half is more than fifteen seconds faster than the second, chances are you would have done better to slow down the first half.

Occasionally, a windy day will turn a two mile race extremely tactical. What usually happens is the field jockeys for position, as nobody wants to lead. A reluctant leader is found, and in his reluctance to lead he sets a slow pace. This slow pace is maintained through the first mile until the runners hear the mile split, grow frustrated, and pick up the pace. You could consider this the same as the pack splitting at the mile mark. This two-mile race then turns into a mile race, with a mile warm up.

The 5th and 6th Laps

The fifth and sixth laps of the two-mile are equivalent to the third lap of the mile. They are the laps in which runners begin to doubt their abilities. They have traveled long and hard, and the finish seems nowhere in sight. These are the laps to take advantage of their weaknesses, to pick up the pace.

Picking up the pace at this point may necessitate taking the lead; or perhaps just passing people and working your way up to the lead. If you have a good kick you may decide to wait, and not lead. If you are more endurance oriented, your best choice may be to try to run away from the field on these laps. Either way, you most likely need to be in the top three to five runners by the end of the sixth lap, depending on how tight the pack is.

The Final Two Laps

With 800 meters left, the two mile race comes alive. Endurance oriented runners begin a long, extended kick that should last them two laps. They try to drop their opponents. This requires a great deal of mental discipline; pacing too is crucial, for you do not want to fizzle out at the end. While some try to out-distance the field, others take the wind break and try to hold on. It makes for some exciting finishes.

Simple Two Mile Strategies

- Go out slow the first mile, and increase your speed the second.
- Take off at the mile mark and put a hard two lap surge in.
- Take the lead the first lap and set a slow pace, suddenly take off with three laps to go.
- Draft the entire way and out-kick your opposition.
- Run a session of surges during the 5th and 6th laps to drop your opponents.
- Run one lap hard, one easy, and hope the pace fluctuations are enough to discourage your opponents from going with your next increase.
- Position yourself in the back of the first pack, and wait until 1-3 laps to go before taking off.
- Take the lead and set a slow pace, every time your opponent tries to pass pick the pace up. Force him to run the outside lanes on the curves.
- Take a commanding lead right away and hope that the distance is great enough to discourage your opponents from pursuing.
- If the pack goes out excessively fast, drop to the back and wait until their pace begins to slow and then pick it up. Pass them quickly and establish a lead.
- Take the lead, hold off competitors, don't let them draft.

Notes

- The two mile is a long enough race that you should rarely have to run the outside lanes. It may be necessary to run the outside lanes during the first lap; but after the first lap, you may be better off to drop to the inside lane, and pick up the pace and pass people on the straight-away.
- You should rarely have to pass on the outside lane. The only exceptions are when you see a split in the pack ahead and need to get into that top pack; or when your speed around the final curve is such that you would benefit from taking to the second lane passing and then getting back into the inside lane.

- Occasionally you will lap a runner in this race, there are several available tactics that will help you put distance on your opponents when lapping. For the specifics of them see "The Middle Laps" under "Racing the 5,000 and 10,000 meters on the track."
- Being boxed in during the two mile is nowhere as severe as it is during shorter races. There is plenty of time to request your opponent to scoot over and let you out. Running in a pack may help you maintain a difficult pace.
- Often your opponent may have already competed in another race. If you know this to be the case, it is to your advantage to take the field out hard.
- If you have already run another race before your two mile, it is to your advantage to establish the lead and take the pack out slow.
- If you are going to race again after the two mile, it is better to win the race in the sixth or seventh lap, and then to cruise; constantly checking your shoulder to make sure you have it won. A kick might take too much out of you for your next race.
- It is a good idea to take four quick steps as you roll off the far corner heading onto the front stretch. Doing this will help to get your pace back up to speed.
- Run as close to the curbs as you can. Every inch of saved distance may help.
- Make sure you count your own laps, as it is easy to forget or misjudge and pay the penalty of kicking too soon or late.

Racing Cross Country

Although Cross Country events can be run for any distance, the most popular seems to be that of the three mile or 5K distance. Three miles is the standard distance of our high school runners throughout the country, while Junior Colleges generally run four miles; and Universities five or 10K. The beauty of strategical racing in cross country is that each and every course provides a host of differing strategies. Unlike a flat 5K, cross country is run over grass, dirt trails, sand, mud, rock, cement, asphalt, hills, ditches, rain, gates, and occasionally streams and hurdles. You can count on sharp turns, poor footing, and an unevenly paced race. You will need to negotiate the pace for gear changing and speed as you compromise to each and every turn, hill, and type of terrain. You will need to have strong concentration, utilize a number of racing tactics, and often simply get dirty.

Cross Country in America is tame compared to Cross Country in Europe. We American's are hooked on the flat, fast road races. We are more concerned with time than

having a good time. We are more concerned with conquering our personal records than conquering a course. The high school and college runners are the most fortunate in America, for they know the thrill of running in it's purest form. Hopefully cross country will catch on in America, and then we can begin to know the joy of competing against a gut-wrenching course; and know the thrill of conquering it.

The Courses

The distinct differences in cross country courses provides the runner, and the coach, with the challenge of developing a strategy that will most optimize the individuals talents, with the geography of the course, and the nature of the competition. It would prove futile to attempt to describe an adequate strategy for all courses. Rather, you need to devise your strategy from what you already know from this book, and your personal experience. Below are many factors to consider when planning a strategy for a cross country course.

1. What will the start be like? How large is the starting line? Does it file down to a narrow path anytime within the first mile?
2. How fast will the field go out? Can you afford to run that pace? Can you afford not to?
3. Where lies the first formidable obstacle? How should you approach it?
4. How can you best utilize the course's geography toward your advantage? Did you walk/jog the course as a warm up to check for new obstacles, mud, or arrows?
5. Should you utilize one of the basic three strategies of pacing? A consistent pace is difficult but a general concept of how hard to run each mile may be helpful.
6. Does the wind play a role? Where? Will blowing dust play a role? Is it better to not keep a wind break so you can see the upcoming terrain?
7. Do you expect a split in the pack? Where?
8. Are there tangents you can utilize? Do you know the shortest routes possible?
9. Do you know the fastest routes possible: not necessarily the shortest routes but the ones that yield the fastest time?
10. Can you cruise and bound the uphill? Fly the downhill?

11. Where should you attempt to move on your competition?

12. Where should you begin your finishing kick?

Developing Your Strategy

After taking into all of the above considerations, and any others you can think of, you must sit down and plan out your ideal strategy. Walk and jog the course before hand. Check out the features in great detail. Run short sections of the course several times for practice. Time different routes around a corner, or in approaching a hill. Find out which paths yield the fastest times. Consider where the bulk of the runners will run and where you plan on being in the pack. If there are mud patches determine whether you would pick up less mud being the first one through or after the pack.

After you have thoroughly analyzed the course, determined how the pack will go out, your weaknesses and strengths, the fastest routes, where you will gain on your opponents, and when you will begin your kick; you should practice the course. There is no pre-race plan as important as practice. Travel to the course before the race and practice running the key positions. Have a coach or friend push you for parts, yell "1-2-3 go" on the top of the hill. Have people cheer for you as you pass by trying best to mentally stimulate the effects of the actual race.

The Race Day

You have thoroughly prepared your strategy for the upcoming race, you know the course well. You know exactly where you are going to do what. Now there is only one other thing to keep in mind. You may have to throw all of that out the window. For in cross country the elements play havoc on your strategy. Flying up "poop out" hill takes on a new meaning in the mud. Being the first through a stream to avoid getting splashed means nothing in the rain. If the weather changes you may need to utilize an alternate strategy.

The weather is not the only thing that can change. You must be prepared for things to unfold differently than expected. You must know what to do if the pack goes out slow, or too fast. You must be prepared to change your tactics around a corner, if you can't make the route you planned. You must be able to alter your plan of building distance on your opponent in the blink of an eye. You never know when your opponent might find a moment of lapse in concentration or pace. You must be prepared to throw your strategy out the window, and intuitively go with the moment.

I recall reading somewhere about the value of being alert during a cross country race. The story was of a runner that suddenly noticed ahead that the path was narrowing, and the runners were backing up in the funnel. This alert runner instinctively hopped up onto a stone wall and ran past the jam and then dropped down from the wall to find himself far ahead of the other runners whom got stuck in the funnel. Now that is tactical thinking!

"You have to have a good start, but what separates first from fifth is strength/speed over the last kilometer. You have to find something in yourself to let you blow it out in the final stages. You've got to finish the race and have nothing left. Then, and only then, do you know you've done it correctly." -Craig Virgin

Notes

- Cross country is decidedly more rough than track or road racing. You may find it necessary to use your elbows to protect yourself from the others. Expect some ruffling of the feathers, especially in the first half mile.
- You may have to be aggressive to pass in cross country. Ideally your strategy will prevent you from being blocked in by a pack, but if this should happen, you may have to yell "track" loudly. If a hole opens up, take to it. If not, you may have to start squeezing in between other runners, and make your own hole. Don't be afraid to nudge others out of the way, but do say "sorry."
- For areas of rough terrain you are far better to surge ahead of your opponents and get a good view. You certainly do not want to be drafting as you negotiate the upcoming terrain.
- Feel at one with the course; glide over its diverse terrain. Feel yourself flow up the hills, and sled the downhills. Take the corners with grace. Like a goat transgressing the rocky mountain side; feel loose and swift.
- Remember that unlike road racing, just because you are experiencing a moment of excruciating pain now, doesn't mean that it will continue. The hills are a challenge to all. When you are dead, know that your opponents are too. Once you emerge from a sluggish mud pit or a prolonged sand trail, pick the pace up again and get going. This is where you can best out-distance your opponents.
- The finishing kick in cross country is never predictable. It may occur when the finish line is in sight, or at the bottom of a hill, or with a half mile to go. The best strategy is to choose to begin your kick when your opponents are not expecting it. Choose to use

an extended kick if the courses curves conceal the finish line. Your opponents are likely to give in. Or use a jump kick moments before you round a corner revealing the finish line.

- Always kick to the finish line. Cross Country races commonly finish in flagged chutes. These chutes start wide and narrow to a single runner's width. The finish line may not be at the beginning of the chute. Usually it is located well into the chute. Kick two steps past the actual line in the ground.
- Once you finish, immediately raise your arms to the side. Often people finishing behind you will pass you in the chute while still slowing. They may be given the place ahead of you. Hold your arms to the side, even hold onto the flags if you can. If they smack into you, it's their problem, not yours. *"Cross Country is most appreciated when it's over."* - Bob Glover and Pete Schuder

The 5,000 and 10,000 Meters on the Track

The 5,000 and 10,000 are markedly different races when they are run on the track as opposed to the roads. The beauty of strategy in these races comes in sheer pacing. With splits every quarter mile, the 5,000 meters allows you to utilize up to 13 splits, while the 10,000 meters can give you up to 26. Hearing your splits can help you make small pace adjustments to allow you to maintain a precise pace.

Pace proves to be the most effective strategy for these races, although your strategy should not be limited to just pace. Considering most runners of the 5,000 and 10,000 meters on the track are either collegiate or elite runners, you are often at the advantage of knowing and having previously raced your opponent. It is wise to study your opponents well, to know how he will typically race this distance. Once you know this, you are best apt to develop a winning strategy.

Perhaps you may decide to keep your opponent in front of you as a wind break for a specified length of time, and then to pass and out distance him. Perhaps you desire to set a slow pace for a specified length of time, and then suddenly bust the race wide open. Or you may choose to hang far back, knowing the pace will go out too fast, and you will catch up during the middle stages the race. You can utilize many of the strategies that have been discussed under racing the two mile, and simply lengthen them to apply to your race.

The 5,000 and 10,000 meters are long enough races to allow ample time for tactics. Use of the wind, and drafting may be the most important tactics to utilize. Keeping a wind break for three miles will save you considerable metabolic energy expenditures. You

will also find these races are opportune for the use of gut-wrenching surges. Unlike races of a shorter distance, the 5,000 and especially the 10,000 meters, hold a comfortable pace for at least the first third, and usually the first half of the race. The level of perceived effort generally increases as the race progresses. Knowing this you can use early surges to burn your opponent out, or late surges to drop your opponent. Remember that the use of tactics are not helpful unless you make a particular move that your opponent is not prepared for. If you surge ahead, only to find yourself being caught by your opponent later, the surge will hinder your performance, as surging takes more out of you than running a steady pace.

The element of surprise will work well at these distances. For the longer the race the more time the mind has to drift. Knowing this you can take advantage of it by slowly pulling away from an opponent at a time when he is off in la la land. Knowing this you also must pay attention to what is occurring, so the same doesn't happen to you. These distances are also far enough to allow you ample time to utilize mental tactics to deal with the pain. See chapter eighteen for more details on pain.

The Start

The 5,000 and 10,000 meters always begin in a waterfall fashion. The race is long enough to allow two or more rows of runners as well. While the starting speed is nowhere near that of the mile, it may still be rapid for 50-100 meters. The reason for this being that the front line runners are as concerned about being trampled as they are establishing position.

The pace will, however, generally settle very quickly. Whether it settles to a speed of your liking or not is a different matter. Sometimes the pack goes hard, sometimes easy, and sometimes steady. If the pack's pace is not to your liking, you must decide whether to take command of the pace. Most of the time the pack goes out a little harder the first two laps, and then settles into a pace that is relatively constant the rest of the race, but you never know.

It is important to establish position as soon as possible, and begin running the inside lane. There is virtually no reason to pass on the outside lanes to get to your desired position. Unless the front pack makes an early break away (highly unlikely) you are best off to remain in your current position for the first half mile, and then to begin to move up through the ranks.

The First Mile

In both the 5,000 and the 10,000 meters, the field stays relatively tight through the first mile. Often the inexperienced runners are too concerned with position the first and second split callings to hear where they are; and the third calling they simply may not be able to understand. By the fourth calling, the mile mark, they will understand what pace they are going, and begin to slow to their pace or begin dying. Thus often the pack split at these distances are more a fact of the front pack maintaining pace, and the others dropping off. Either way, just like the two mile race, you must be prepared to move to get into that pack. If your eventual goal is to win, or place high, you will likely find it necessary to run with the lead pack.

In the 5,000 and 10,000 meter track races, the packs are not a standard pack. That is to say, they are not two or three runners abreast; rather they are single file. Perhaps we should call the pack a train instead. It makes sense that they are generally single file, nobody wants to run the second lane mile after mile. This provides you with both a problem, and an opportunity. The problem lies in that it is not easy to detect a pack split (train split) on the straights. Therefore, you are advised to scan the train during the curves so you can look for a split. If you see one opening up, then make your move just before you enter the curve or after. The opportunity lies in dropping opponents behind you. If you are ready to increase the pace, do so on the straight-away, when the others can not see the increase. If you increase the pace on the curve, they will see the gap opening up, and possibly pursue.

The Middle Laps

The excitement of the initial mile has worn off. The packs have split, you now feel like you are racing against 5-10 runners rather than the whole field. It is now time to go to work. I rarely recommend making moves before the mile mark in the 5,000 meter and the two mile mark in the 10,000. The pace is simply too fast to do much. After, however, it is time to go to work. It is crucial to utilize optimum pacing during these laps. Without the use of the watch you are likely to think that the second mile of the 5,000 and the 3rd of the 10,000 are the same pace as the first or first two respectively. This is usually not so. Generally, the pace will slow during these miles. How can you ensure that the pace doesn't? Know your splits.

I have previously mentioned that the use of the splits is one of the beauties of these distances. The other beauty is that few runners know their splits. They wouldn't know the difference between a 6:15 and a 7:45 6th lap. They may not even know what lap their on! Learning your splits will help you immensely. Study and memorize your splits before your race. You should know exactly what time you will pass through each and every lap

mark. If you pass too quickly, you may decide to either hold the pace or slow a bit. If you pass too slowly, you probably want to increase the pace. During these mentally challenging middle laps you can gain distance on your opponents by simply maintaining the same pace. They will slow and you will go.

Depending on the over-all quality of competition you may find that you begin to actually lap other runners in the race. Here lies yet another opportunity to gain a little distance on

your pursuing opponents. There are many ways to do this:

- If you are approaching a runner whom is on the inside lanes you may be able to judge your pace so that you pass him just before the curve, this will mean that your competitor(s) behind you will have to go around him on the curve.
- If you are approaching a runner on the inside lane during the straight-away - you can yell "track"; hopefully he will move over a lane and as you pass say, "thanks". There is a chance that he will then move back into the first lane, just in time to interfere with your opponent. Now a true sport might say "more coming" to keep this lapped runner out a lane, but the choice is yours.
- If you are approaching a runner on the straight-away just two feet or three from the curb - and there is a runner on your right, pass him on the inside lane. As you pass on his left, he will suddenly be aware that you are there and react moving into the second lane, where guess who he meets! Yes, your opponent. However, some officials will say that if you cause your opponent's forward progress to be impeded by passing on the inside lane, you're at fault.
- If you are approaching a pack of runners on the straight-away yell nothing. Simply find the best path through them, and then pick up the pace. Once you pass, they will get the idea that they are supposed to move over or do something, they will then begin to jostle positions, herding to the right; just as your pursuing opponent tries to make it through the same path you did. Once again its bumper derby. If your opponent is the first through a pack, yell "track" before he gets there; that way they scramble to the right and the path is clear by the time you get there.
- If you are approaching a pack of runners on the curve - Yell "track" far in advance and get them to move over so that you don't have to run the outside lane. Try saying "thanks" again, it might work.

- If you are approaching a single runner on the curve and there is an opponent at your side - yell “track” and he will move a lane, this will allow you to pass on his left, while your competitor will probably have to take to lane three to pass.

The Finish

As you enter the last mile of either race, you can utilize a tactic defined by Bill Dellinger and Bill Freeman in The Competitive Runners Training Book, as sprint-float-sprint. It is a form of surging, yet over much less distance. Pick the pace up for 5-20 steps, and then maintain the previous pace. Repeated bouts of this over the last mile will help to hold off those trying to catch. You want to ensure that your little bursts of speed are sufficient enough to prevent them from catching you and drafting off of you, while not too strong to burn the finishing kick out of you. I find this technique works best by getting up on my toes for 10 steps, then down.

Like all other distances you need to determine what type of kick to use. If you are right on your opponents back, or just in front of him, you are probably best to perform a jump kick. (Read chapter four about Types of Kicks and How to Develop One). If you are in the lead with a considerable distance, or have distance to make up, you are best to use an extended kick. Just how far these kicks are is usually dependent upon how long you can obtain and maintain a kick. Some will be able to do it for the entire last mile, some for the last half-mile and some for only meters. Once again, it is helpful to know your opponents abilities as well, so you may plan against them. It often proves effective to throw in a difficult one lap surge with three laps to go. The move will catch your opponents off guard, and the distance will hopefully be maintained to the finish.

Notes

- It is important to remember that the 5,000 and 10,000 Meters races are 3.1 and 6.2 miles respectively. Do not make the mistake of kicking to the three mile, or six mile mark, to find you have more to go.
- Keep track of your own laps. It is easy to kick a lap too early.
- Remember that the officials can not keep track of everybody's laps in the race. The remaining laps counter is for the race leaders only.
- If you know that you have lapped another runner, and he mistakenly stops a lap too soon, tell him immediately, “one more, one more” before he has the chance to stop. You’re simply doing him a favor and you make sure he doesn’t get away with it.

- You should try to hold off passing opponents on the curves so they will have to run the second lane. You should rarely, have to pass on the outside lane yourself.
- Sometimes you may be best to scoot out 1-2 feet on the straight-away so that you can see what is happening to the pack (train) up ahead of you.
- The use of mental tactics to deal with the pain associated with the intense efforts at these distances will work toward your advantage (see chapter eighteen).

“There is no thrill in easy sailing when the skies are clear and blue, there’s no joy in merely doing things which any one can do... But there is some satisfaction that is mighty sweet to take, when you reach a destination that you thought you’d never make.” - Spirilla

The Five Kilometer Road Race

Although the 5K road race is the same distance as the 5,000 meters on the track, it is an entirely different event. Like the 5,000 on the track it utilizes pacing strategies as the primary strategies; however, the road race provides the opportunity to exercise different overall strategies, and different tactics. 5K road races differ, much like cross country courses do. Some are plain, flat, fast, out and back courses, in which strategies are much like that of the 5,000 meters on the track; and others are, hilly, or have sharp corners to round. Therefore, the first consideration in preparing a strategy for a 5K road race is the course.

The Start

The start of a road 5K is always fast. Unlike a collegiate or high school race, where everybody knows each other, you generally have no idea who is who, and how you fair. The result is a fast start. You are therefore advised to situate yourself on the starting line appropriately. Depending on the quality of competition and the course; the field may go out and hold the first mile pace, or they may slow. If the course is flat the leaders will probably go through in 4:45 or less. Unless you can run a 15:30 5K, you’re better off not to get into this pack.

I ran a considerably hilly 5K race the other day that began with a 300 meter downhill, followed by a 800 meter uphill. I positioned myself in the fourth line at the start, as I knew the field would go out excessively fast. Everybody got carried away with that fast three hundred meter downhill and then maintained that pace up the half mile hill. At the top they were left for dead. I have never heard so many people cop out of a race so soon. At the four-hundred meter mark I heard people yelling “Go ahead Joe, I’ll see you at the finish”. I found myself in around 150th place at the mile mark, passing people like a

heard of cows. Over the course of the second mile, I simply maintained my pace and moved into 9th place, eventually finishing in 3rd. Having run the course for a warm up I knew that the downhill start would cause havoc, and it did.

Unlike cross country races, road races generally do not file down into a smaller area. Most races start on the span of the streets width, and maintain that span the entire race, or narrows at most to one car lanes width. Either way, there is most always ample room to pass. There may exist ideal places to pass an opponent, around a corner or as a group goes by, are two methods that come to mind. Always pass with speed. The entire first mile is generally very fast. Runners are continually searching for their personal record, and they figure, correctly, that the roads are the best place for it. The result - a fast first mile.

The Split

Much like the 5,000 meters on the road, the split in the road 5K usually occurs around the one mile mark. It is not sudden, and there is plenty of time to react. Unlike the track 5,000 there is plenty of time to see the approaching split since the runners are truly in packs, not a train. The front pack will most always go through in 4:45 or less, so you need to decide what pack you should belong to.

The Second Mile

In the second mile of the 5K the pace generally slows. This is the ideal mile to make your move. Most are tired from a hard first mile, and the finish line seems a light year away. You may take advantage of this mile to push hard putting distance on your opponents. By running the first mile in a reasonable pace you will certainly catch many runners whom started too fast.

The Last Mile

By the two mile mark of the 5K most of the positions have been relatively established. Some jostling will certainly occur, yet most of the positions will remain relatively constant. The third mile requires a scope of attention that will allow you to pay attention to what is going on in the race, yet also allow you to focus on dealing with the pain, and pushing the pace. Obviously, the third mile of the 5K can be quit painful. Learning how to deal with this pain will serve you well. Read chapter eighteen to learn more about dealing with race pain.

You will need to decide what type of kick to perform, depending on where you are, and what your goals are. If your goal is simply time, then I recommend using an

extended kick. If your goal is place, then I recommend finding a tactical time to jump kick on your opponents to put them away. For more on these types of kicks see chapter four.

Notes

- Unlike Cross Country if you obtain a level of physiological pain during a flat 5K, it is not going to cease. You must either learn to live with it (chapter 18) or slow. Effective pacing is crucial at this distance.
- Always sprint through the finish line, and then stop your watch. Put your arms out to the side to prevent others from passing you in the chute.

The 8K and 10K Road Race

In this section I will discuss the 10K race. Please know that the 8K race is only 1.2 miles shorter, and basically the same strategies may be adopted. The primary difference between the 8K and the 10K is that the 8K allows for more surges, or hard moves. The first and last miles of the 8K are generally faster than the 10K while the middle ones tend to see the same pace. In a sense the 8K is like a 10K with the most painful mile 4-5 taken out.

The 10K is considered either the longest middle distance race or the shortest distance race. Either way it provides the racer with the opportunity to utilize his endurance and a bit of speed. While pacing is the most important strategy for this distance, it is the last event that will allow for sporadic running. It is acceptable to go out hard in the 10K, or to push the third fourth and fifth miles. Six miles allows you to conveniently break the race up into segments. All farther distances require more consistent pacing for optimal performance. All of this makes the 10K race a grueling spectacle of endurance, strength, and, yes, some speed.

Your 10K pace will be slightly slower than your 8K pace. Looking at the race equivalency chart in chapter twelve you will see that a 25:09 8K is equivalent to a 31:55 10K, with the mile paces being approximately 5:03 and 5:08. In fact your 10K pace will not be much slower than that of your 5K pace. The 8K equivalency of this 31:55 10K is a 4:54 pace. I wish I could say that when the distance is doubled the pace is cut in half, but it's not. Considering the obvious large increment in distance between the 5K and the 10K and the small minutes per mile pacing difference, you can see how the 10K could stack up to be an incredibly painful race.

The First Mile

There is absolutely no reason to tear out in the first mile of the 10K. It is far too easy to run considerably faster than desired, as your nervous energy makes the perceived effort seem easy. If you hit oxygen debt in the first mile, you are in for a long, long, 5.2 miles. If you are racing this distance, you should have a strong sense of pace. Know whether you are going out too fast or not. Know that it is OK for that overly zealous person wearing high tops to be ahead of you in the first half mile. Often we feel that the world is passing us by at the start and can't stand to see so many "slow" people in front of us. Let them go! Believe me you will see them again soon.

The 10K is a long race, there is generally little reason to make a move in the first mile. Now, I'm not saying that you should never run the first mile hard, you may have good reason to do so. Just be aware that too fast a first mile can ruin your race. Knowing this, it is valuable to maintain a conservative pace the first mile. Find a wind break, consider this first mile or two free. Let your opponent in front of you do the work. Just focus on remaining relaxed and breathing deep. Your perceived effort should be minimal in the first mile(s). Keep your attention span wide for this first mile. Pay attention to how fast the packs are going, where you are and where you want to be.

The Second Mile

After you pass through the mile mark you will receive your mile split. You will then know whether your pace is on or not and perhaps make adjustments for it. Now you are holding a smooth and consistent pace. The rabbits have died, and the race is pregnant with opportunity. Find someone who is running just slightly faster than your desired race pace and use them as a wind break. If you desire to run 7:00 miles then you certainly can run 6:50 miles with a wind break. Focus your span of attention onto remaining relaxed. You probably won't have to focus hard on remaining behind your wind break since the perceived effort is still minimal at this point of the race. Focus on relaxation and form. Every once and a while, widen your attention span to see what is happening to the runners in front of you, where the course is going, and other external factors. If this windbreak holds your pace, or just slightly faster, stay with it. You may stay with it for miles.

The Halfway Mark

Hopefully you will pass through the halfway mark in the time you desired. You should have entered the race with a strategy of either, going out fast, maintaining pace, or picking it up. If your pace is on, congratulations. If not, you need to decide what to do. If

your pace is slightly faster than predicted, do nothing, hold it, chances are you are capable of it. If it is on, or slower, you may elect to pick the pace up.

Once you pass through the halfway mark the race truly begins. Many of the people who went out hard, will drop back. The race is only half over and people are tired. The idea of running the same pace for another 3.1 miles seems intolerable. Now is the time to move. This is the time to pass opponents. This is the time they are most likely to give in. You may wish to view the 10K race as a two mile race. You simply warm up for 3.1 miles, and run hard from 3.1 to 5.1, and finish with whatever you have left. Viewing the race in this fashion will help you break up the effort in your mind. This strategy will also allow you to push when the others slow; thereby putting twice the distance on them. When using this strategy, simply keep a break the first half, focus on relaxation and visualize your taking off at the 3.1 mile mark. Visualize yourself (yes, while running) passing your opponents with ease, feeling like a delicate deer gliding through grass meadows. Pick people off one by one. Imagine yourself scratching another little human figurine on the side of your car, as you mow them down. Use whatever method that allows you to push hard these two miles; for you can always run the last hard.

Once you pass the halfway point, you are not automatically disqualified from taking a wind break, if you can find one, that is. Once again find one that is running your pace or faster. You may find it helpful to shorten and quicken the stride during these two miles. Pretend your dropping your gears down into the passing gears. You may concentrate on different facets of your form. Perhaps focus on ankle flexion, leg lift, or knee flex. Again do whatever it takes to maintain pace.

The Final Mile

The last mile, like the last mile in any race, is one you can always do. Knowing that it is indeed the last mile is usually enough inspiration to speed up, or at least maintain the pace. You are best advised to move early on any opponent that is within striking distance with a mile to go. If you wait any longer, you may find that as you pick up the pace to catch, he will pick up the pace to kick. If you do catch him, chances are you will be too tired to pass. Like all races you must decide whether to use a jump or extended kick. Once again, if time is your prime consideration, than the extended kick is preferred.

Notes

- Speed still proves valuable at this distance, so don't neglect your speed workouts.
- Utilize all the tactics that you do in shorter distance races.

- Drink fluids at the first mile mark, especially sugared ones; they may help you in the final mile.
- It is important to stay cool, dump water over your head, wear white clothes, etc...
- Knowing the course will give you a definite advantage.

Racing 10 Miles through 20

Pacing, Pacing, Pacing, Relax, Relax, Relax, Second Half, Second Half, Second Half. Pacing, Relax, Second Half, or P.R.S. - the three words that will enable you to race this distance your best. Pacing is of crucial importance. These races rarely, except at the elite level, see the use of sporadic pacing, surges, or other draining efforts. The key to racing these distances is consistency. You may still choose one of the three basic strategies talked about at the beginning of this chapter. You probably will decide not to use the going out fast and holding on technique, and opt for an even paced or slowly increased pace. If you are experienced at these distances you will know which one works best for you.

Relaxation is the next important word. Tenseness will devastate your race at these distances. You must work on relaxation, you must learn to run relaxed habitually. The second half, is when to move. Early moves at these distances tend to prove futile. It is important to tell yourself during the early stages of the race, "Second half, relax, until the second half." To race these distances, you are obviously in very fine physical condition. This being so, it is easy to be running at your desired race pace and to be fooled into thinking that it is too slow. Only to find out later, particularly the second half, that it wasn't too slow. "Loose and relaxed, I will wait until the second half."

The First Half of the Race

When the gun goes off, establish pace immediately. It is far too easy to get swept away and run a much faster first mile than desired. If you come flying through the first mile thirty seconds faster than your desired pace, you could certainly cause considerable slowing during the last miles of the race. At the sound of the gun, establish pace. Practice should help you know what your race pace is. If your going to race 10-20 miles you should be able to keep that race pace up for 6-10 miles in practice and consider it easy. If you are unsure of your pace, your best bet is to slow down as chances are you are going out too fast anyway. There are plenty of miles to make up for lost time if you should (unlikely) go out too slow.

Find yourself a pack of runners and get in behind them. There is absolutely no reason to break the wind in a race like this. You will find that races of these distances tend to break up into distinct packs after a few miles. Get into one. You should also study the course you are going to run. If it is flat, then there is no problem. A hilly course requires you to put your expertise to use. Study the hills, and develop a strategy particular to you and the course.

Work on P.R.S. to get a P.R. You should know your pace well from all your training. You should also be extremely familiar with your running time. You want to know how fast you should pass each mile marker. If you do not have a watch that holds 30 memories, like my Casio, buy one. If you can't find one, then you need to be able to do math in your head. Or at least know what total splits you desire to come by each mile in.

Relax to the max. Your concentration should be a narrow beam. Focusing on your relaxation, form, and holding on to the runners in front of you. There is plenty of time for mental games. See chapter eighteen to effectively learn how to deal with the time required for this distance.

The Second Half

What do you do different the second half of the race than the first? Not much. Simply maintain pace. Work on the P.R. of P.R.S (discussed earlier) and deal with the distractions (chapter 18). If you still feel strong, then it is acceptable to pick the pace up a little; but just a little. If things still feel good with a few miles to go, pick it up again. You can make considerable time on your personal record by clocking a fast last three to six miles. Maintain your wind break until there is less than a mile to go. If you desire to beat someone in particular, wait behind him. Let him take the disadvantage that is the wind, and move out hard with less than a mile to go, put on thirty to fifty meters, and simply maintain that distance.

Notes

- Fluid and sugar intake is crucial for these distance. Read chapter seven for information on fluid intake and chapter nineteen for information on sugar replacement.
- Use tactics at these distances. For some reason runners cease to use tactics during these long runs. They are like little ducks, waiting for you to shoot 'em down with your tactic gun.
- Utilize all tools possible to keep cool. Run the tangents.

Marathoning

"You can see very tangible results from the effort you put into a marathon. There is nothing wishy-washy about the marathon. There is nothing abstract about it...You get your time, you get your results...It's a clear cut, pure sort of thing." -Bill Rodgers

The modern marathon commemorates the running feats of the ancient Greek herald Pheidippides. In 490 B.C., the Athenian Army defeated the Persians at a Greek town called Marathon. Legend has it that Pheidippides ran the 22 miles from the Plain of Marathon to Athens, gasped the words "rejoice, we conquer," then died on the spot. (Osler, 1978, 38). The first modern Olympic Games in 1896 held the distance at around 24 miles, and finally in 1908 the standard of 26.2 miles was set as that was the distance from the lawn at Windsor Castle to the Royal Box inside the London Stadium. The queen wanted her grandchildren to see the start.

Today the marathon serves as a standard by which we judge ourselves. To complete a marathon is similar in accomplishment to having acquired a college degree or batting 300. It is something that holds others in awe. There is good reason for this. The marathon is one of the most formidable mental and physical challenges the laymen can take on. Fortunately it is also accessible for everyone to attempt. It's more accessible than conquering Mt. Everest and is more challenging than sky diving. (You know - the vertical downhill mile!)

The lyrics of singer Sinead O'Connor's "Nothing compares 2 U" accurately describes our relationship with the marathon. For the marathon marks the height of difficulty. The next lower standard racing distance of twenty miles pails in comparison to the 26.2 mile trek. On the other hand, anything farther is simply out of reach for most, and necessitates walking as an integral part of these races. Yes for the runner, the marathon represents the ultimate challenge. You verses yourself. You verses 26.2 miles.

Most all runners agree that the marathon is really two races, the first half being twenty miles, and the second half being the last 10K. Physiologically there is good reason for this, our bodies run out of stored sugar supplies around this mark (known as the wall), we begin to burn fat, and fatigue can hit suddenly and hit hard. Extreme hunger pains, physical exhaustion, mental anguish, and muscular tenseness accompany the runner over the last 6.2 miles. Successfully beating these hurdles, will result in one of the most satisfying experiences possible. To prove that you are in control of your body, that your mind is stronger than your body.

Hitting the wall need not always be a physical problem. Psychologist Jerry Lynch writes in the October 1990 issue of Runner's World: "Let me help you recall a common

experience. You pass mile 21 and noticeably begin to slow down. No matter how hard you try, your legs become heavier, your turnover is sluggish, and you want the race to be over...Please don't let it happen you think...The fear results from the mind's images of impending doom. Whether or not you really are doomed does not matter because the mind does not distinguish between real or imagined possibilities; the image born out of fear brings debilitating physical responses. Blood flows shift away from your extremities, muscles go into spasm. At the first sign of increased fatigue your worst fears are confirmed, you've hit the wall."

Of course not all runners hit the wall. Obviously the elite runners suffer nowhere near the pains as do the middle and back of the pack runners. Their high level of training and natural abilities helps them endure these final miles. For the average Joe, without the 100 mile training weeks, the last 6.2 miles are what makes the marathon, the marathon. To be successful, or even to finish, the marathon requires preparation and pacing. The principle of P.R.S. (pacing, relaxation, second half) applies to the marathon. However, in the marathon the second half refers to the 20 mile mark.

"Some people say that the marathon does not begin until twenty miles...The real truth is that the first few miles are the most important...People who make mistakes in the early miles by going out too fast or not taking in enough water are the ones who aren't going to win the race, or, perhaps, even finish it." - Bill Rodgers

Pacing

When designing a pacing strategy, the only real strategy for this distance, you need to consider several factors. Most of the crucial factors to be considered are listed below. Use these factors to design a pacing schedule.

- Is it your first marathon? If so the slower the pace the better. If you could complete a twenty miler in a workout without walking then you should try to run the marathon at the same pace, and go the extra 6.2. If not you should perhaps walk for one minute every ten.
- Are you going to race it or run it? If you are going to race it you will need to have plenty of experience at racing the half marathon through twenty miles. Knowing your sense of pace is crucial.
- Where did you hit the wall in your last marathon? Evaluate your splits, decide where you can slow down, to ensure running faster at the end.

- Where (if any) do the hills lie? You need to be plenty fresh to take them on. If they are early in the race you should run them as easy as possible, they could reek serious havoc on your last 6 miles if you run them hard. For more read about the L.A. Marathon under “Starting Slow and Increasing the Pace” earlier in this chapter.
- What will the weather likely be like? Where will the winds howl? How about the heat? What side of the street is the shade on?
- How fast will the race go out? Where should you position yourself at the start.
- What racing strategies worked best for your half marathon or farther races. Keeping a steady pace? Going out hard? Or picking up the pace as you go? Most find that the first few miles of the marathon should be the slowest.
- There is an old adage that for every second per mile you run faster during the first half you will run two seconds slower during the second half. For the marathon this most likely is increased. Seconds too fast per mile at the beginning of the race may result in minutes slower during the last few miles.

Taking these factors into consideration you should develop a race plan. Or you may choose to use one of the basic plans listed below, or perhaps modify it. There are positives and negatives to all of these strategies.

Building Up Time

This strategy calls for an expected slowing at the end of the race, and trying to build up time for it by going out a little faster over the first 1-8 miles. You may choose to run each mile 5,10,15,20,25, or even 30 seconds faster than your goal average pace over the distance. Most of us feel supercharged when the gun goes off. We are in top physical shape, and anxious to put ourselves to the test. We tend to fly the first few miles effortlessly. This strategy allows for this. It puts few restrictions on us. Of course, like all strategies, this one is a gamble. The possible rewards are great: as you may hold the pace for much or all of the race and run faster than you ever dreamed. The possible losses are greater too, as it is likely that you will seriously hit the wall.

A Steady Pace

This is by far the safest, and the most recommended strategy. It requires you to set one pace and to hold it throughout the race. The actual pace may vary as you transgress the hills; the effort, however, would remain the same. Ideally each mile will get just a little harder, and you will have to really push the last few. If you are going to utilize this

strategy you will most likely need to pull on the reins the first mile, to prevent from being carried away. You will most likely have to run what feels like an extremely slow pace. You must be content to let others go past you. This will ensure that you do not run this first mile too fast. If you violate your game plan and accidentally run a little faster, do not panic, chalk it up to adrenaline, and then set the appropriate pace.

Running Positive Splits

Running positive splits in the marathon suggests that you run up to two minutes faster in the first half than the second. You decide where to pick up these minutes, early, middle, or late in the first half. It is strongly recommended that your first half be two minutes faster or less than the second half. If you run more than two minutes faster the first half, chances are you will pay during the second half, and your time too will suffer.

Running Free

You may find that the best way to approach the marathon is to take the distractions of time and pace away. Simply run as you feel. Should you feel like running faster do so. This strategy will certainly take the stress away that is associated with pacing. You may decide to avoid even wearing a watch. As you pass the mile marks and see or hear your total time, avoid calculating it in your head as to what pace you are running. Of course some of the calculations may be too easy to avoid. The concept, however, is to alleviate yourself of the stress of the splits, so just don't dwell on them.

Running Negative Splits

For many it may be advisable to run negative splits. That is to say that the second half is faster than the first. To do so requires extreme patience. This strategy allows you to easily break the race up in your head. You may choose to run the first 6 miles as a warm up, slowly increasing the pace over the first half, and then pick up the pace. Utilizing the P.R.S. (Pace, Relax, Second Half) technique has proved to work well for many.

Coming From Behind

This strategy works more for those trying to beat a particular competitor or place in the overall race. The advantages of this strategy are that it allows the racer to disregard pace, and simply remain behind the leader(s) for the first half of the race to the 20 mile mark. This strategy requires one of the two beliefs: 1) either you have strong belief in your abilities to poor it on the last few miles; or 2) you believe that due to environmental or other factors the leaders will go out too fast. Putting your marbles into this basket has proved successful for many elite racers. American Steve Spence shocked the world by

placing third in the 1991 Track and Field World Championships in Tokyo using this strategy. Spence (believed highly unlikely to be a contender) paced himself a minute back for the first half of the race. With belief in his coaches strategy and his 10K speed, he began to slowly catch, with 3 kilometers remaining he was in 8th, and he surprised all when he entered the stadium in third. He was the first American to medal in a World Championship marathon - ever!

Going out too fast: What to do and how to prevent it

It is so easy to get swept up into too fast a start that you must plan a particular strategy to prevent it. First off knowing pace will help. If you plan on running a 2:37 marathon you should be able to run 6:00 miles on the nose without the aid of a watch. Unfortunately, the beginning of the marathon plays with your sense of pace, and even the most experienced misjudge their pace. I confess to having gone out in 5:08 when I had planned on going 6:00 once. Upon realizing this error I forced myself to slow "way" down, yeah way down, I passed the second mile in 5:41. "That's not so bad I thought", I then reopened the throttle quite unknowingly to pass through the next mile in 5:29. The point I am trying to illustrate is that it can be nearly impossible to stop a speeding bullet. Like a train, without putting on the brakes you will just keep on rolling.

To prevent from going out too fast you may employ one or a combination of the several following strategies. The first thing you should do is check your level of arousal at the starting line. Chances are that it is high. Especially if you are standing at the start of something like the N.Y.C., Boston, Chicago, or L.A. Marathon. If you are pumped, you need to deflate, to let out the anxiety. You can perform standing relaxation, or visualize yourself in a green meadow. You can listen to a personal Walkman set to a soft station.

To further prevent from going out too fast, I recommend that you measure off prior to the race day the first quarter, half, and three quarters of a mile mark. Figure out what you should pass these in. This way you will only go out fast for a quarter mile before recognizing it as opposed to a mile. I also recommend, depending on the race, picking a friend who will help you set the appropriate pace for the first mile. He'll be more level headed.

OK, so all of these measures have failed, you still went out too fast, what now? Remain relaxed! Stay calm. Panicking will only serve to create tenseness that will hinder your total performance. If you went out the first mile 5-15 seconds too fast, consider it free time, and go on with your pace. If your time is 20-30 seconds too fast, you will need to drastically slow your pace for about a hundred meters; then resume your race pace. Should you come through the mile mark in anything faster than thirty seconds stop and walk for twenty meters or so. Then begin running again at your desired race pace. By

stopping, you will be allowed to start again. You are given the opportunity to set the pace correctly. It often takes such serious measures to break your excess speed. Without these measures chances are you will go on to run too fast for several miles, before it catches up to you. Ultimately, you will pay in excess during the last miles for going out too fast the first few.

Racing for Time? Choose Your Course Wisely

The marathon is such a long distance race that course variables play a large role in determining your total finish time. Many runners, coaches, and officials question whether there should even be such a thing as a World Record for the marathon. The courses are simply to diverse. Who is to say which is worse the hills of New York, or the heat of L.A.? The major variables include: Heat, humidity, hills, wind, and start time. The affects of each of these has already been discussed in chapter seven with the exception of starting time, and time of year.

The earlier in the morning the start the cooler it is. However, the draw backs are that are circadian rhythms may not be used to running this early in the morning. Should you choose an early starting time, you are best to switch your workout schedule to match that of the starting time for two weeks prior to the race. Races held later might be warmer. Perhaps the ideal time of the day to race the marathon would actually be the late afternoon. E.C. Fredrick Ph.D., says in a 1987 Runner's World article that studies of record performances reveal that the optimal hours for racing are in the late afternoon or evening. He theorizes that a 5'9" 145 pound male 3:30 marathoner can save 2.5% off of his finish time by running a marathon with a 4:00 P.M. start or later.

The time of year is obviously important, running in extreme heat will obviously affect your performance. However, there is another factor to consider. Ideally you should choose a race that not only allows for optimal whether conditions, but one that meets nicely with your training schedule. We tend to train at different intensities throughout the year. Our schedules, the weather, and our training pyramid all determine what months we will be able to train more and what months we will train less.

