

EXERCISES FOR RUNNERS



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EXERCISES FOR RUNNERS

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FOREWORD

This book is for runners who think they hate extra exercise or think they don't need it.

An article in *Runner's World* ("The Runner's Final Stretch," Jan. 73) tells of such a runner. He says at the start, "I hate to exercise. Running isn't exercise for me. It is smooth movement. The word 'exercise' conjures up images of what running isn't. Funny, phony, jerky little dances inflicted as punishment by army drill sergeants and done in desperation by overweight housewives. I don't do these exercises. Haven't since I did my last army pushup..."

He couldn't see the point in it. The exercises seemed irrelevant, and running seemed to be enough. Seemed to be until a mysterious series of injuries hit him and a doctor traced them to a severe lack of flexibility in the legs.

This is common. The same doctor says he can spot a runner from across the room by the tightness of his calves and hamstrings. Running does this to people. At one and the same time, it's both too much and not enough for the legs. It's an overspecialized action: straight-ahead, every-step-the-same movement which overbuilds the hardest-working muscles and lets others coast. The overall effect is inflexibility and muscle imbalance.

The result: when legs in this condition take on unaccustomed stress—a quick shift from distance to speed training, a change of shoes, a pick-up football or basketball game, a hard race—the injury risk is high.

Dr. George Sheehan writes of this in his *Encyclopedia of Athletic Medicine*. He quotes sports physiotherapist Joseph Zohar: "To help prevent injuries and strains, muscles must be strengthened and stretched to levels above the normal requirements of the sport. It is abnormal pulls and abnormal strains and stresses that produce injuries."

"Levels above the normal requirements of the sport" obviously can't be reached within the sport. So runners have to go outside of it for supplemental strength and flexibility work. Weight training and yoga-like stretching appear to be the most practical supplements, and emphasis here is on these two.

Injury-prevention is the most important function of these exercises. They are designed for runners, to neutralize and correct the unbalanced and inflexible situation running produces. Admittedly, this is a negative emphasis.

But strengthening and stretching have positive effects, too, in the form of improved performances. Simply staying healthy can improve them, of course. But there are other bonuses. Sprinters and hurdlers in particular gain explosive power from well-planned weight training, and distance runners may also profit from this in smaller degrees. Power translates to speed. Added flexibility can mean smoother movement, economy of action and inches added to the normal stride length. These, too, become speed.

Chapter I

TESTING



Bil Canfield

RUNNING'S BAD RESULTS

BY GEORGE SHEEHAN, M.D.

When an athlete goes into training, three things can happen to his muscles. Two of them are bad: shortening of the strengthened muscles with loss of flexibility; weakness of the opposing, relatively unused muscles.

"The irony is that the athlete is less fit in regard to flexibility standards than the typical man in the street," writes *Fitness for Living* editor Robert Bahr. "That's because strengthening and endurance exercises act to shorten muscles and reduce flexibility." It is Bahr's belief also that most muscle tears, pulls and strains occur because of this lack of flexibility.

The best answer to this lack of flexibility is yoga. For one thing, in yoga the stretching is gentle, smooth, non-painful and achieved over a period of time. "Stretching by bobbing or bouncing," writes physiologist Dr. Herbert de Vries, "invokes the stretch reflex which actually opposes the desired stretching."

Yoga or not, the stretching athlete is only halfway home. He has to start strengthening exercises of the weakened antagonist muscles. This will prevent the imbalance in muscle strength that many observers feel is the other major cause of pulls, tears and strains.

"A number of studies have shown," says physiotherapist Joseph Zohar, "that when one muscle group is excessively stronger than the opposing muscle group, the odds of injury in the weaker muscle are greatly increased." The evidence is that an excessively high ratio of strength between the quadriceps (the front thigh muscles) and the hamstrings (the rear thigh muscles) increases the chance of a hamstring pull.

The principle is easy, the application difficult. Each sport strengthens and therefore shortens a different set of muscles. The flexibility problems of a sprinter, for instance, differ from those of the distance runner, as do his muscle imbalances. The distance runner has stronger, shorter hamstrings and therefore tends to pull his weaker quadriceps. The sprinter who uses his quads to explode out of the blocks has weaker hamstrings, and the back of his thigh is where he grabs when he gets that tearing sensation midway in the 100-yard dash.

The main interest of the people in sports medicine is not to predict these events (which some researchers have done by testing athletes) but to prevent them. This biomechanical approach to muscle balance provides just such a program. It is part yoga, part muscle balancing. Zohar calls it preventive conditioning. What it means is that no weakness, no tightness, no muscle imbalance will go uncorrected.

When an athlete trains that way, when he applies engineering and architectural principles to his body, he doesn't have to worry about the two bad things that usually happen. And he may even get some unexpected dividends.

"The balanced conditioning of individual muscle groups," states Zohar, "not only protects the body against injury but also improves its performance to unprecedented levels."

But before you can start stretching and strengthening, you need to find out where you are tight or out of balance, what you can do to correct the irregularities and what bonus or side-effects you can expect.

SEE WHERE YOU STAND

Can you touch your toes?

Put this book aside, stand up, knees straight, feet together, and bend forward slowly and carefully. Reach down with your fingertips until the tightening muscles in the backs of your legs.

If you're a runner, have been for some time and have not been doing flexibility work for that time, you're probably right now hung up somewhere along the shinbone between the knee and the ankle. Don't feel bad. You aren't alone. Running does this to people, and the simple toe- or floor-touch is the most telling evidence that they haven't taken corrective measures against tightening.

Most runners are overly tight in the legs. Dr. Steven Subotnick, a podiatrist with a large athlete clientele, says the trait is almost universal in his runner-patients. He says nine in 10 of them can't pass minimum tests of flexibility. Dr. Subotnick thinks this is one of the main reasons the runners come to see him in such numbers.

"The runner must be aware," Subotnick says, "of the fact that strengthening and endurance exercises reduce their flexibility. Long and middle distance running results in overdeveloping of the muscles at the back of the lower leg and thigh, in particular the gastrocnemius and soleus in the lower leg, and the hamstring in the thigh."

The doctor says the need for exercises to counteract this tightening "cannot be overstressed." Running muscles are chronically pounded and tensed. They must be fully stretched and relaxed, too, and this doesn't happen while running.

Robert Bahr of *Fitness for Living* magazine writes, "When muscles are forced to contract regularly, the facial sheath that covers the muscles and the sarcolemma of the muscle fiber tend to shorten... When there is no effort to maintain flexibility, tendons and ligaments also shorten with the passing of time. Occasionally, calcium deposits may build up in the joints, further restricting movement."

Chronically tense, chronically short muscles don't work as they should. They come to restrict the running motion, and predispose the runner to injury.

Dr. Hans Kraus, a pioneer in fitness testing, says that "a muscle must relax. Relaxing is part of its function. If a muscle fails to relax, it stays tight. It loses its stretch, its suppleness, its give. Over a period of time, it becomes permanently shortened. When this happens, a muscle loses most of its ability to relax."

At that point, an individual—regardless of the specific conditioning he thinks he has—is "unfit" by Dr. Kraus' standards. An athlete who can run a mile under five minutes or a marathon under three hours may not even be able to bend over and touch his toes. That is the cost of overspecialized development. The bill is too often paid in pain.

Robert Bahr points out, "The irony is that, all other things being equal, (this type of athlete) actually becomes less fit in regard to flexibility than the typical man in the street."

Dr. Kraus adds, "We would feel that these individuals, even though they are extremely 'fit' for their particular endeavors, are not desirably fit from the overall health point of view—and (are) more exposed to muscle strains than their more flexible counterparts."

The same is true when certain running muscles grow powerful with use, while opposing ones required for a healthy balance are allowed to go flabby from neglect. We'll get into particular leg muscle problems in Chapter Three. But here let's talk about the stomach—more precisely, the abdominal muscles. These are a little-recognized source of trouble.

Put the book aside again. Lie down and do a sit-up. Can you do an honest one without straining? Many runners can't according to Dr. George Sheehan, because their abdominals are weak in comparison to the back muscles. When this happens, the spine can be tugged out of alignment, leading to one of the most persistent and dreaded of runner complaints: sciatica. Sharp pains originate in the small of the back and shoot down the legs. This ailment nearly crippled Steve Prefontaine during 1973.

The floor-touch and the sit-up are two of the six Kraus-Weber tests. Drs. Hans Kraus and Sonja Weber devised the tests to measure strength and flexibility. (See the accompanying diagrams and descriptions.)

Kraus says the simple exercises "are designed to test the key muscle groups in your body, no matter what your age, height or weight. These tests are self-correlating. They do not judge you by some outside, arbitrary standard. They do not ask you to be as strong as a coal miner or as lithe as an acrobat. Instead, these tests simply reveal whether or not you have sufficient muscular strength to move your own body weight and the muscular flexibility to match your own size."

If passing these six is a minimum standard for everyday fitness, a runner should have to race through them with ease. Can you? Try all six, exactly as outlined.

"If you passed all six," Kraus says, "you have sufficient strength and flexibility for your weight and height. But if you failed even one of the six you are underexercised or overtensed, and you need help. In fact, if you had difficulty passing any one of the six tests you should consider yourself below par. This may seem severe or unfair. But you would not be considered healthy if you had perfect vision and hearing, a good pulse rate, but an abnormal red-cell blood count."

Runners apparently are most likely to fail floor-touching and sit-ups. The general public shows the same weaknesses. Kraus notes, "The floor-touch test is failed by a high percentage of patients, and more frequently by men than by women...The weakness of the abdominal muscles is most frequently found in women, especially after pregnancy."

All but the severest cases of weakness and inflexibility are completely reversible through corrective exercises. According to Dr. Kraus, "Your muscles can be trained, if you take the trouble to train them properly. They can become strong and relaxed through purposeful exercise, or they can become shortened and tense from lack of exercise and overirritation.

"Like mischievous children, muscles are more inclined to stick to bad habits than persist in good ones. How they behave is up to you. Overtensing

and shortening of your muscles are very bad habits, and once acquired they may be hard to break.”

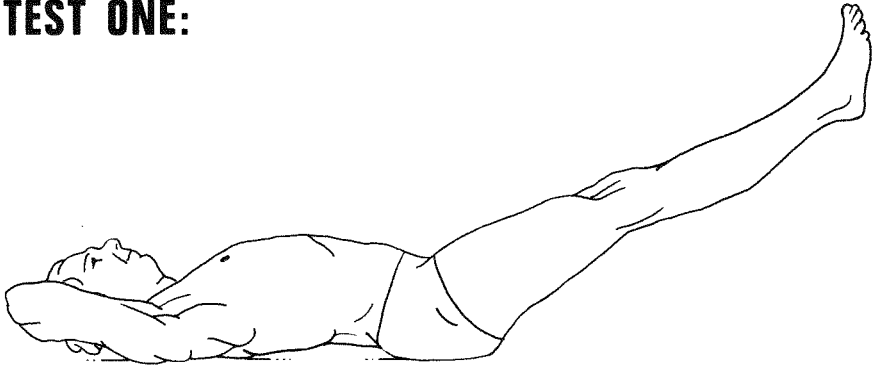
Breaking old and wrong habits requires doing the right kinds of exercises and doing them regularly. It isn't as simple as doing floor-touches and sit-ups. For one thing, they can be dangerous when done improperly. (They put strain on the lower back in violent, repeated movement. For another, they aren't enough.) Reconditioning requires a well-rounded set of special exercises.

We've been quoting from Dr. Kraus' book, *The Cause, Prevention and Treatment of Backache, Stress and Tension* (Simon and Schuster, 1965). Despite its unwieldy title, it has good advice for runners. It tells how to devise personal programs, based on individual needs.

Kraus says, “The majority of people do not know what their needs are, yet they buy exercise books and go at the exercises with a vengeance. In doing this, they often injure themselves... I would no more think of telling everyone to do the same set of exercises than your family doctor would tell all his patients—no matter whether they had a broken leg, sinus trouble, or heart disease—to take the same medicine.”

With a Kraus-Weber screening, runners can find where or if they need treatment. This is sound preventive medicine.

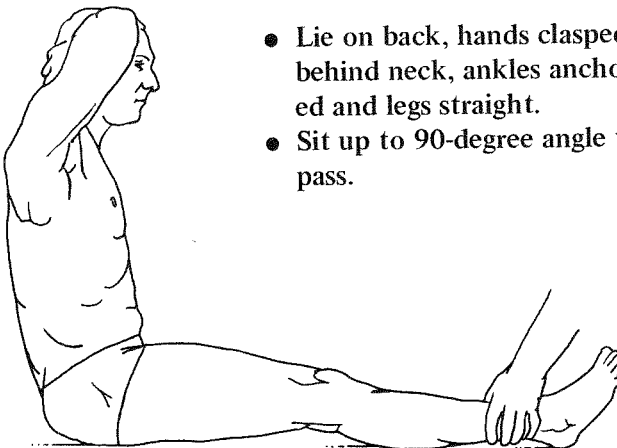
TEST ONE:



HIP-FLEXOR STRENGTH

- Lie on back, hands clasped behind neck, legs straight and together.
- Raise straight legs until heels are 10 inches off floor.
- Hold 10 seconds to pass.

TEST TWO:



- Lie on back, hands clasped behind neck, ankles anchored and legs straight.
- Sit up to 90-degree angle to pass.

HIP-FLEXORS, ABDOMINALS

TEST THREE:

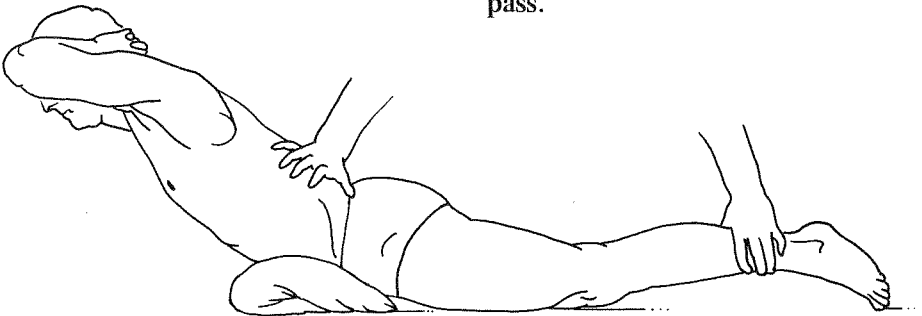
- Lie on back, hands clasped behind neck, ankles anchored, knees at about a 90-degree angle.
- Sit up straight to pass.



ABDOMINAL STRENGTH

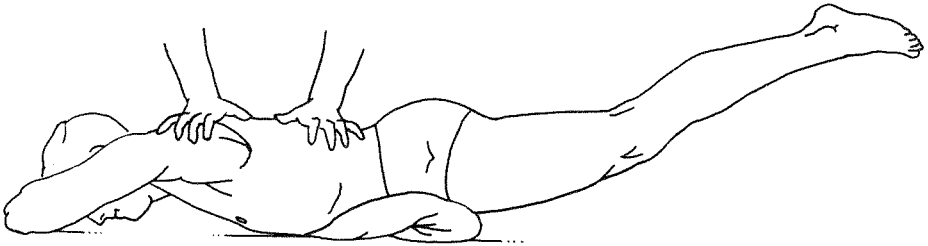
TEST FOUR:

- Lie on stomach, hands clasped behind neck, pillow under abdomen, ankles and small of back anchored.
- Lift trunk.
- Hold 10 seconds to pass.



UPPER-BACK STRENGTH

TEST FIVE:

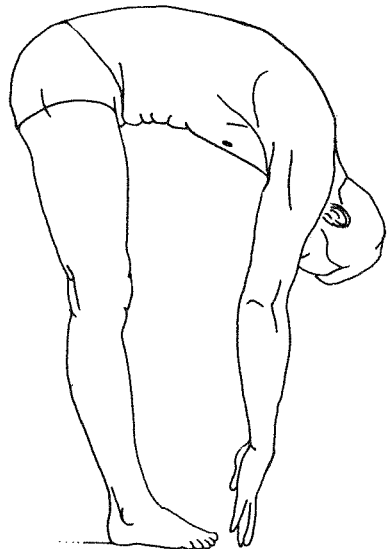


LOWER-BACK STRENGTH

- Lie on stomach, arms folded under head, pillow under abdomen, back anchored.
- Lift legs (together).
- Hold 10 seconds to pass.

TEST SIX:

- Stand up straight, feet together.
- Bend slowly from waist, knees straight.
- Touch floor with fingertips to pass.



LEG, BACK FLEXIBILITY

Chapter II

STRETCH



Bil Canfield

TWO-WAY STRETCHING

If you think we're about to go into the dreary "hup-two-three-four" routine of high school gym class and army basic training calisthenics, relax. There will be none of that here, for a couple of good reasons.

First, runners instinctively recoil when they hear anyone "hup-two-three-fouring" them. They get enough of this cadence-calling when they're on the streets, running, without carrying it over into supplemental stretching exercises. At best, the calisthenics which call for a cadence are mechanical, regimented, repetitious movements which are for a cadence done more from a feeling of duty than with any real interest or enjoyment.

But more importantly, authorities now are questioning the value of these conventional exercises as a path to flexibility. Robert Bahr, editor of *Fitness for Living*, writes, "The need for flexibility has long been recognized by fitness experts. In both our high schools and the armed services, token recognition of the need for flexibility is given in terms of the calisthenics program. But recent evidence indicates that calisthenics are not advisable for this purpose."

Bahr relies heavily on the evidence of Herbert de Vries, a physiologist at the University of Southern California and author of *Physiology of Exercise for Physical Education and Athletics* (William C. Brown Company Publishers, Dubuque, Iowa, 1966).

Dr. de Vries separates stretching exercises into two categories: "ballistic" and "static." Ballistic exercises are the standard vigorous calisthenics. They feature quick, repeated movements. Static exercises involve slow and rhythmic stretching, stopping and holding a position at the point of first discomfort.

In his Southern California laboratory, de Vries has tried to determine which of the stretching methods is superior. Earlier tests told him "that both slow and fast stretching are effective, and that there is no significant difference between them." He confirmed this in tests of his own, using equivalent ballistic and static exercises.

"It was found," he explains in his book, "that both methods result in significant gains in static flexibility (in seven 30-minute training periods)... There was no significant difference between methods."

When done properly, the effects of the two appear to be equal. Yet de Vries strongly recommends static stretching. His case is based on "three distinct advantages":

- There is less danger of going beyond the safe limits of stretching since the exerciser moves into position slowly and stops before hurting himself. With ballistic exercises, he may realize too late that he has bounced past his limit.
- Energy costs are lower with static stretching, so the exercises don't tire athletes for other activities.
- Ballistic exercises may cause muscle soreness. Static stretching tends to relieve such soreness.

In short, de Vries prefers static exercises because the effort and the

risk are lower. The runner's natural reaction to tiring extra exercise is to avoid it, thereby getting no stretching at all. The natural reaction when doing bouncing-type calisthenics is to bounce too vigorously, thereby defeating the purpose of the exercise.

De Vries says that when a muscle is jerked into extension, it responds by jerking back and shortening itself again. It is this jerking back and forth is too violent the result is soreness.

According to de Vries, "Activities most likely to result in soreness are: (1) vigorous muscle contractions with a muscle in a shortened condition... (2) muscle contractions that involve jerky movements... (3) muscle contractions that involve repetitions of the same movement over a long period of time... (4) bouncing-type stretching movements."

He seems to have defined running and the standard calisthenics runners use, calisthenics which may be contributing to inflexibility and soreness rather than counteracting them as intended.

The authors of *Foundations of Conditioning* (Academic Press, New York and London, 1970) agree with Dr. de Vries. They offer evidence that violent stretching before athletic events "is a predisposing cause of subsequent muscle injury."

They continue, "Empirical observations of athletes tend to indicate that uncontrolled stretching of a ballistic nature may indeed increase the incidence of pulled or torn muscle tissue rather than decrease their incidence, which is one of the original intents of the use of flexibility exercises in warm-up prior to performance."

When Herbert de Vries was working out his static stretching plan, he took an important clue from swimmers, who are particularly prone to calf cramping.

"Competitive swimmers and swimming coaches know," de Vries says, "that swimmer's cramp (gastrocnemius) is promptly relieved by gently forcing the cramped muscle into the longest possible state and holding it there for a moment.

"It was hypothesized that the simple stretching technique that relieves a swimmer's cramp in the calf muscle should also be effective in providing prevention and relief for any muscle that can be put on stretch."

The hope in stretching is to prevent soreness through adequate flexibility. But any runner knows that some carry-over pain is inevitable in his sport. Methods that can keep pain moderate and flush it out quickly are good enough. And Dr. de Vries has such a method.

He tells athletes to determine which muscle or muscles are involved, find the muscular attachments of the involved muscle or muscles and then "devise a simple position in which the attachments are held as far apart as possible with the least possible effort... Hold this position for two two-minute periods, with a one-minute rest period intervening. If the pain is severe, this should be repeated two or three times daily. This procedure has been effective even in chronic muscular problems."

De Vries says, "Many yoga exercises have been found useful since they use the same principles." The truth is more likely the reverse. His exercises are effective because they are based in hatha yoga, which is as old as history itself.

NO STRAIN, NO PAIN

The roots of sound stretching techniques go back some 4000 years. Yoga originated in India at least that long ago, and it has come to be an entire life philosophy for those who take it seriously.

Our concern here is only with the physical side of it—the “hatha yoga” practice. The spiritual meditative side is ignored, though this kind of separation is foreign to the yoga way of thinking. The word yoga in sanskrit means “unity,” and when mind and body are split much is lost.

May the yogis forgive us for borrowing so shamelessly to suit our own needs. No doubt we’ve lost sight of the true aim of yoga, which is self-control and self-understanding far beyond anything running can give. Perhaps because Western man is more physical and segmented in his outlook than the Indian, the exercise part of yoga always has received more attention in North America and Europe than have the contemplative features.

Old-line yogis might freeze in their lotus postures if they read how their ancient art has been cheapened on early-morning television shows for overweight housewives and in mass-circulation magazines for over-tensed businessmen (to say nothing of booklets for over-run runners).

Apparently, though, even this fraction of yoga has much to offer. And it has the versatility to offer its values to people who wouldn’t any more meditate than bathe in the Ganges. Hatha Yoga has an appeal lacking in other, newer forms of bending and stretching. Hence, the growing popularity.

Richard Hittleman hosts a TV exercise series called “Yoga for Health.” His following is so wide that he has had to write five yoga books to satisfy the demand. Hittleman has been a leading translator of yoga principles into the Western way of thinking and exercising. He hasn’t compromised the basic integrity of the system. He merely emphasizes what Americans want to hear and do.

Hittleman writes, “Stretching is the key to relieving tension and releasing energy.” The yoga *asanas* (postures), in their infinite variety, all concentrate on gently stretching away the forces that make people look and feel uptight.

Yoga isn’t like the exercise Westerners have grown up with in school sports. There is none of the strain and pain, sudden movement, exertion or repetition of calisthenics.

“Inherent in most systems of calisthenics,” Hittleman says, “is the need to execute many quick repetitions of exercises, huff, puff, perspire and experience general discomfort and fatigue...But meaningful exercise, which I define in terms of *methodical body manipulation*, need contain none of the above.

“Indeed, a yoga session is designed to be a highly pleasurable experience in which the exact opposites are true. That is, the movements are performed in relaxing slow motion with very few repetitions. No strain should ever be felt, and the practice sessions leave you feeling elevated and revitalized, not drained.”

There is no place for hurry or for competitive urges in yoga. Save those for the track and road. Yoga above all requires great patience, concentration and control.

Hittleman says, "Remember that you must never strain, jerk or fight to achieve a more extreme position. Just go as far as you can, regardless of where it may be, and have the patience to hold (the posture) as indicated. The 'hold' will gradually impart the elasticity that is needed to accomplish the most extreme positions."

He claims that as long as the demands on the body are moderate but regular, the flexibility to accomplish the extreme positions comes with time. It may be a long time coming, he says, but don't rush. People who hurry in yoga only get hurt. One has to work within his own limitations and progress at his own rate.

Hittleman's advice here is particularly relevant to tight runners: "It is well to remember that most physical problems have developed over a period of time—months or years. And when attempting to deal with them through natural means, such as yoga, it is unrealistic to expect an immediate solution. If the laws of nature have been abused for prolonged periods, no sudden reversal of the resultant condition can be expected."

Yoga requires no apparatus, no pain, only a little sweat. All it really takes is time, which as it turns out is the hardest thing for a Westerner to give. Yogis, with 40 centuries of tradition backing them, talk as if they have all the time in the world. A busy, impatient runner who's already spending an hour or so a day in sport needs convincing that the extra minutes of yoga are necessary.

LEARNING THE HARD WAY

Perfect health may seem to be the ideal state of man, and uninterrupted pleasure may be his dream. But pain has positive values, too.

Garrett Tomczak, a runner-writer with philosophical leanings, writes, "If an individual is rational and intelligent, he will soon recognize and understand his pains—you know which ones are warning lights and which are challenges."

He notes that "pain is the transition between different and ever higher levels of consciousness. It can open up profound depths whose existence is not even suspected by the man who goes gaily on his way, untried by pain."

True enough. But perhaps this is a bit too lofty a concept to recognize immediately as being pertinent to running medicine. Dr. George Sheehan, the runners' advisor, is more to the point. He says, "If it weren't for my injuries, I don't know what I'd have to write about in *Runner's World*. I've learned more from my own aches and pains than from my formal medical practice."

"Physician, heal thyself," Nietzsche said a long time ago. And never is a cure so urgent as when the doctor is a runner and he himself is suffering. Dr. Sheehan gets a lot of mileage from his self-treatment. He's forced to find a solution to his own problem. When he finds it, he steps to that higher level of consciousness that Garrett Tomczak describes. Then the doctor gets to tell other runners about his discovery.

This is the advantage of having access to the running press. When most runners are injured, they must suffer in silence. When they discover a personal miracle cure, it generally stays personal. A writer like Dr. Sheehan—or Robert Bahr of *Fitness for Living* or Joe Henderson of *RW*—gets to share his suffering with a mass audience, whether that audience wants to hear it or not.

Those who write about running are just like anyone else who runs. They don't worry much about what they don't have wrong with them. They don't often practice preventive medicine, but only go looking for solutions to problems as pain makes itself felt. Pain demands relief, and in that way is an effective teacher.

The writers, like anyone else, stumble from cure to cure until they find one that works. Then they rush to their typewriters to pound out the success story. The motives are honorable, not self-serving. They want to pass along the lesson so other runners won't have to suffer so much and stumble along so desperately looking for relief.

But not much of the experience seems to sink into a reader until he himself is faced with a similar situation and pain demands that he reread that old article.

Joe Henderson here at *RW* hadn't bothered to read the article by Robert Bahr when it first came out in *Fitness for Living* months earlier. It was about exercises, and Henderson was one of those running purists who thought he needed nothing but running. Now Henderson was hurting.

He wrote of an exchange with a doctor. When the doctor bent back the toes on the offending foot, Joe yelped.

"Where does it hurt?" the doctor asked.

"Up here," Henderson said, pointing to his calf.

"Ah ha! Stand up and bend over. See if you can touch your toes."

When Henderson tried, his fingertips stopped high on his shins.

"I think I see what might be wrong with you," the doctor said. "Your calves are unusually strong and tight, even for a runner. You're overdeveloped there from your years of running. Your achilles tendon is like a rubber band that is always stretching to the point of breaking. When you put the slightest extra pull on it, something gives. Sometimes it's the achilles itself, sometimes the calf muscle. In this case, it's the area where the tendon attaches to the heel. Unless you do something about those tight calves, you'll keep having trouble."

The doctor didn't say what exactly to do, except to mention "exercises." That's when Henderson went back and reread Bahr. The magazine editor said in effect that his work gave him a headache and his play made him uptight. Henderson, a magazine editor himself, felt the same way. His writing sent him home with a tension headache two or three nights a week. The doctor told him what running had done to his legs.

Bahr's article said, "When there is no effort to maintain flexibility, tendons and ligaments (as well as muscles) shorten with the passing of time. Occasionally, calcium deposits may build up." Henderson had calcium deposits forming at the points on both feet where the achilles tendons insert into the heel bone, and one of the lumps was inflamed. Bahr had his interest.

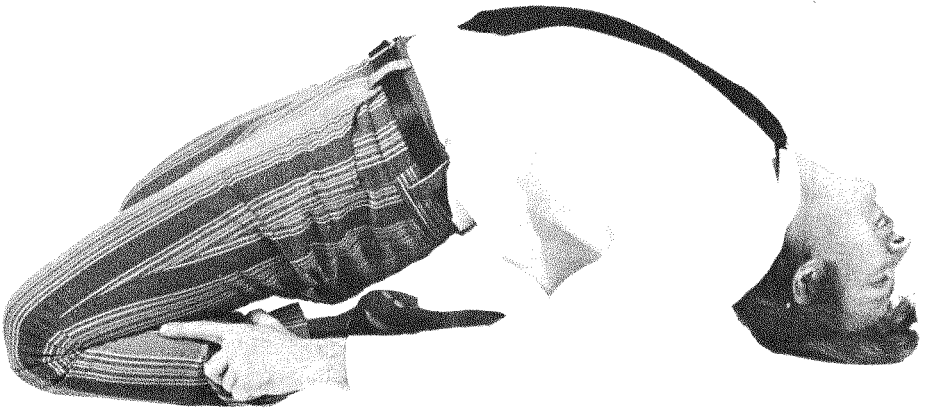
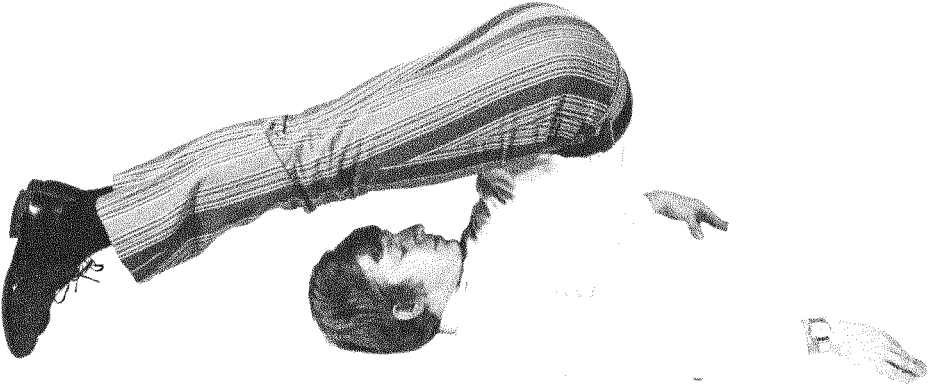
One night Bahr had been particularly achy. He couldn't sleep, so he got up to do some relaxing exercises. "I climbed out of bed, sat on the floor and tried to touch my toes," he said. "Even I was astonished. I could not even reach my ankles. Right there and then I devised three stretch exercises for taking the tension out of my body." (See the accompanying pictures of Bahr, after he'd advanced considerably with the three positions.)

He mentioned yoga. Henderson had never thought of yoga in connection with running, but now he was in the "I'll-try-anything" stage.

"If yoga exercises do anything," Bahr wrote, "they force you to loosen up again. Every position requires you to stretch and loosen a ligament, tendon or muscle you've spent a lifetime tightening." He warned that the exercises must be done "without significant strain, jerking movements or force."

After a couple of months on Bahr's basic three positions, Henderson rushed to his typewriter to pound out a story for *RW*. He told what a rude shock the beginning had been. Bahr had said, "It works so well it truly amazes me." But Henderson's initial burst of enthusiasm was replaced quickly by frustration with his extreme limitations. He felt much as a beginning distance runner must feel in his first few weeks: eager, then discouraged, then finally determined to push forward at his own rate.

He wrote, "When you're a total novice like I am, victories have to be small ones. After three weeks of everyday stretching, my toes barely scraped the carpet on the floor on the plough. I grazed my knees with my forehead on the sitting toe-touch (we'll forget for now that there was six inches of daylight under the knees). I felt happy as a jogger must when he gets through his first mile."



The damage to Joe's feet had gone too far, though, for exercises to correct. He needed surgery on one heel to take out a calcium deposit which was irritating an achilles tendon. The doctor said, "It may be as much as a year before you're back to normal."

Even while the cast was on, Henderson kept up his stretching. By this time, he'd added new positions for a total of about 10 a day. (Bahr's plus others covered later in this chapter). The session took 15-20 minutes each evening, or as he put it, "one side of a record album."

As soon as the cast came off, he was running again. Seven months later, he ran a marathon almost as fast as any he'd done before the operation. Both he and the doctor attribute the quicker-than-normal recovery to the stretching.

"I'm sure this is true," Henderson says, "because if I skip even one night of stretching the repaired heel, I'm very stiff there the next morning when I run."

Any other obvious benefits? "I *feel* I'm recovering from the muscle soreness of long races in half the time now. I *feel* that I got over a minor calf muscle problem (caused by running in badly overrun shoes) much quicker than usual. I *feel* my running action is smoother, more fluid than ever before. But I can't really prove any of these things."

One thing he can prove is that he's having fewer headaches after days of writing. This has been an unexpected bonus from the stretching. "The exercises drain away tension," Henderson says. "I don't have one headache a month now."

He admits, though, that progress hasn't been startling, and that even after a year of this he still could barely meet Hans Kraus' minimum fitness standard of a simple floor touch.

"It was almost 11 months from the time I started stretching until I first scraped the floor with my fingernails," Joe says. "When I did it, I felt almost as happy as when I first broke three hours in the marathon."

"I know this isn't much of a feat, any more than breaking three hours is that impressive. But I was elated just to have come this far, no matter how long it took. If it hadn't been a pleasant kind of exercise in itself, I probably wouldn't have bothered to come."

The pleasant trip began with pain.

LEFT: Robert Bahr demonstrates his three introductory stretching exercises. (Photos courtesy of "Fitness for Living" magazine)

YOGA FOR THE RUNNER

BY IAN JACKSON

I used to believe that distance runners were biologically unique, gifted with inborn endurance capacities that an average individual (like myself) could never dream of matching. I used to believe the same things about yoga adepts too—that their incredible flexibility was an inborn trait, something that set them apart from the average.

Now I realize that we all have great endurance capacities lying dormant within the very structure of our tissues, waiting to be tapped. I realize the same thing about flexibility. It is potential in all of us, and it's waiting to be released. This story tells how the excitement of releasing endurance pushed me to run myself right out of running, and how the excitement of releasing flexibility pushed me, gently, right back in.

I first tried endurance training several years after my mediocre career in college cross-country and track. I didn't think of it as training at the time—it was just aerobic health running, inspired by Dr. Kenneth Cooper's revolutionary book *Aerobics*. But once I had made reasonable progress, I began getting encouragement from competitive runners, and further inspiration from books they recommended to me—books like Joe Henderson's *LSD The Humane Way to Train*, and Tom Osler's *The Conditioning of Distance Runners*.

These influences gradually revised my belief that I was biologically disqualified from distance running. Eventually they led me to the starting line of my first marathon. And to my very pleasant surprise, they led me all the way to the finish line. Although my time was not good, I was elated simply to have finished. The race was so thoroughly enjoyable I decided right there and then that there would be plenty more "next times." Over the next year or so, there were indeed plenty more—with distances ranging from 10 to 50 kilometers. There was also a steady improvement in times and placings, an improvement which kept me constantly surprised and disbelieving. ("The watches must be off." "The course must be short." "Anyone I beat must have had a bad day.")

Finally, however, the disbelief abated. I began to see myself in the role of a competitor more than a health runner—a contender for high places in local races. A few experiences out in front were sufficient. Once I had tasted the blend of fierce, competitive intensity and precise control of power, I was hooked. I wanted more than anything to multiply, to refine, and to expand those peak experiences through ever greater racing achievements.

This new attitude was the beginning of the end for my running. Over the next few months my workouts grew steadily longer and faster. At first I went through a tremendous surge in strength and endurance. At first my dreams of top-class racing seemed to be coming true. But then things started to go wrong. My legs seemed always to be sore and stiff. I went through uncharacteristic mood changes; I felt generally clumsy and uncoordinated. I was often tired from one workout to the next.

I was overtraining, overstressing myself, forcing a slow and inexorable breakdown by pushing myself too hard. As I explained in a *Runner's World* article ("The Root of All Training," May 73), I came to realize what I was

doing through Hans Selye's brilliant and widely acclaimed book, *The Stress of Life*. Besides helping me understand the problem of excess stress, Selye's book also gave me some excellent advice on what to do about it.

The most important (and least expected) advice dealt with two philosophical issues: (1) the problems of interpersonal relationships and (2) the need for an ultimate goal in life. In the first place, the needless stressors of "fights, frustrations, and insecurities" could be eliminated by living so as to earn the gratitude, rather than the revenge of others. In the second place, the stress of aimlessly drifting through life could be eliminated by adopting the philosophy of "expressing (oneself) fully, according to (one's) own lights."

As Selye points out in his inspiring discussion, adapting wisely to stress "is not easy...It takes much practice and almost constant self-analysis." This kind of effort was the last thing I expected to take on when I first started my running for fitness, but I see it now as a logical development. After all, a superior heart-lung system is wasted in a person crippled by frustrations, hostilities and anxieties. I agree with Selye: this effort is not easy, but the rewards are abundant. As I practiced his philosophy, I found my life becoming brighter, simpler, more fulfilling and more meaningful.

As for my running, I simply cut down on the speed and distance, dropped my competitive obsessions, and started enjoying myself again. Almost all the symptoms of overstress dropped away and I felt myself entering into a new mode of balanced, harmonious living.

UNDOING THE DAMAGE

There was only one remaining problem: my legs seemed to be disintegrating. In several hard races, I had become so completely absorbed in the struggle that the pains in my legs could not penetrate into my awareness until I crossed the finish line and slowed down. The same pattern was repeated on a larger scale now: all the pains that my racing obsession had masked suddenly came to life and clamored for attention.

I had been aware of low-level soreness and tightness for some time, but I was totally unprepared for the interlaced agony that now seized me. Hips, thighs, knees, shins, ankles, feet and especially hamstrings, as if overjoyed to have an opportunity, now began screaming accusations of abuse at me.

I was appalled at this evidence of severe overwork, and amazed that I had been able to suppress the pain for so long. No matter how much I cut down on pace and distance, the pains got worse. My right hamstring was so bad that I thought it must be severely torn or traumatized. Running friends suggested that I might have sciatica.

At this critical period of confusion, I came across the article on stretching and muscular imbalance ("The Runner's Final Stretch," Jan. 73 *RW*) which is described earlier in this section. I was relieved to find such a simple explanation for my problems. All I had to do now was to add a little stretching to my daily routine—or so I thought, until I actually tried the positions shown in the photos on page 20. I failed miserably on all of them. In a half-hour of red-faced, futile struggling I could not even come close to achieving them.

After this humiliation, I wanted nothing more to do with them. The

idea of facing that frustrating failure in a daily stretching session didn't appeal to me at all. Rather, I created an ingenious fantasy to soften the sting of defeat. I could easily attain those positions, I told myself, if only I did a few warm-up stretches first. After all, my stiffness was only superficial, like a dried crust of mud on a running shoe. A few good twists and flexes would break up the crust of muscle stiffness as easily as a crust of dried mud.

Yoga was mentioned in the *RW* article, so I decided to consult some yoga books, feeling confident that they would show me the secret. I toured a few used book stores (like many runners, I am a pauper), and returned home with a handful of hatha yoga texts. All I needed now was to find a progressive sequence of stretches to lead quickly and efficiently to the kind of flexibility demonstrated in the photos.

But what a surprise I got when I looked closely into the books I had bought. Although Robert Bahr's positions had looked easy, they had been impossible. The positions in the books did not even look easy. The photos showed dark, intense-looking Indians, "sitting," "standing," or "lying" in extreme pretzel-twisted positions that made Bahr's look like child's play. They were downright discouraging.

Luckily, some of the books in my selection seemed to understand my problem. I found one particularly helpful: Richard Hittleman's *Be Young With Yoga*, a step-by-step, seven-week program in the course of which 20 yoga practices are learned. Another helpful book was Eugene Rawls' *A Handbook of Yoga for Modern Living*.

Although I'd found an ideal introductory program, my problems were far from over. I still entertained delusions about my stiffness. I still thought it was a superficial crust, as easy to break as the dried mud on a shoe. I thought I could look forward to complete flexibility by the end of the seven-week program.

Hittleman made it clear that it was foolish to expect such rapid improvement, and I should have realized that a seven-week plan for flexibility was as absurd as a seven-week plan for marathon fitness. However, I convinced myself that I was an exception to the rule, and I started the first week of the program with a determined frontal assault.

The first position was the one that Bahr demonstrates on page 20. Hittleman calls it the "preliminary leg pull." When I tried it the first day, I could barely secure a grip on my shins just below the knee. In this position, my hamstrings and my backbone were stretched about as tightly as possible. But (trying to break through the "crust") I forced my elbows out as far as possible, straining to bring my head down towards my knees. My legs and arms were trembling violently, and the pain was intense. After 10 endless seconds, I released the tension and went on to the other positions, attacking them with the same senseless force.

Hittleman believes that, once you've learned and practiced hatha yoga, "you will find that you will never want to discontinue the exercises." By the end of that first week, however, my legs were more painful than ever, and my whole body ached. Not only did I *want* to discontinue the exercises, I *had* to.

Of course, I was in the wrong, not Hittleman. The frontal, crust-breaking assault that I had been trying was not yoga at all, but a form of self-tor-

ture. I reluctantly admitted to myself that my stiffness was far from superficial. It was solidly, deeply rooted. I took a week's layoff to recover. When I started practice again, I read Hittleman's directions with a new respect.

He says you should always stop when "you reach the point beyond which you can no longer stretch comfortably...for there is never to be any strain in the practice of yoga." This reminded me of Arthur Lydiard's famous principle, "Train, don't strain." Having learned the lesson in running, I should have been more cautious in my approach to yoga. Perhaps all these lessons have to be learned the hard way. Even if I had started stretching gently, sooner or later I would have had to explore straining, if only to discover the difference between practicing too gently and too forcefully.

Learning the distinction between the two is not easy. Even after months of practice I still occasionally suffered soreness after pushing a good stretch into a damaging strain. I can suggest a method that I have found helpful, one that makes you sensitive to muscle tensions. I found it in Eva Ruchpaul's book, *Hatha Yoga*. She recommends what I would call a dynamic stretch, as opposed to Hittleman's static stretch. Instead of holding the yoga pose motionless at the borderline of comfort, Ruchpaul recommends holding it there attentively, waiting for the muscles to relax, and then gently, precisely, taking up the slack.

In the forward bending pose, for instance, you should start by reaching and holding as far down the shins with the hands and as close to the knees with the head as is comfortably possible. Then you should wait, with all your attention concentrated on the stretching muscles, until you sense an easing of the tension. At this point you should widen your elbows and pull down your head so that the slack is taken up. Throughout the duration of the pose, you should keep yourself as focussed as possible in your muscle sensations, always balancing the tension right on the edge of comfort.

This method has the advantage of the absorbing fascination of self-exploration. Hittleman's method has the advantage of safety. I use the first when all is going well, and Hittleman's when I am recovering from soreness.

Once I had given up my "crust-breaking" method, and learned correct practice, I began to appreciate just how effective yoga can be. Each session calmed and relaxed me. Some of them, the most perfectly executed of them, were so enjoyable that I would start from the beginning and work my way through all the positions again. Occasionally, I now find myself setting aside a couple of hours on a quieter evening for a session of very slow, very smooth stretches, in which I strive for the utmost in concentration and precision. Can you imagine getting that kind of satisfaction from calisthenics? I can't.

THE MAJOR BENEFIT

What happened as my practice progressed? There were many benefits that I know I would not have experienced with traditional exercises. The most obvious result was that I began to experience the kind of ease in ordinary, everyday activity that I thought was the privilege only of childhood. The changes were gradual and subtle, but their cumulative effect made a great deal of difference.

As I progressed, I realized how profoundly our thoughts and feelings are influenced by simple little consequences of reduced flexibility. For instance, when we can no longer twist our necks and spines, we tend to move our whole bodies in order to look behind or to the side. Then we tend to resign ourselves with the part of the world that lies straight ahead. The consequences of self-limitations like this are of major importance in the process of physical and psychological aging.

Have you ever watched young children playing on rough ground, running and jumping, with no care whatsoever for the dangers of twists and sprains of the knees and ankles? Better yet, can you conjure up a vivid recollection of yourself when you moved with that same freedom?

I ask these questions because of a remarkable experience I had recently, an experience which dramatically and unexpectedly showed me some of the changes that my yoga practice had brought about. I was hiking in the hills, cautiously making my way down a steep slope, when I stumbled, lost control, and started slipping, sliding and then running headlong towards the bottom. I thought I was in imminent danger of a sprained ankle or knee, but after just a few steps I realized that there was something radically different in the way I was moving.

As my feet hit the bumps, plunged into the ruts and rolled on the loose stones, they seemed to be flexing and adjusting in a marvellously fluid manner. By the time I reached the bottom of the slope, I realized that I was in no more danger of a sprain than a rubber-limbed child would be. The practice of the lotus pose had made my joints as flexible as they were over 20 years ago. I am probably more flexible right now than I have ever been.

I could mention other minor details, such as being able to sit comfortably erect for hours of reading or writing, and being able to tie my shoe laces without bending my knees and without any tightness in my hamstrings. But rather than giving a catalogue of benefits, I'd like to give the overall impression—the total result of all these little changes in combination. It is best described as a feeling of “weightlessness,” a loose, exhilarating, floating feeling of weightlessness.

When I had progressed in hatha yoga for a few weeks, I dropped my running entirely. Frankly, I was tired of running, and I found Yoga just as satisfying, if not more so. I vaguely intended to start running again, but I made no definite plans about it. I might easily have become one of those drop-outs who never runs another step.

Yoga wouldn't let me stop, though. As I got loose and comfortable, as the “weightless” sensation became more constant, I was pushed right back into running. I couldn't help myself. I would be walking to the store, feeling so light and at ease that I would spontaneously break into a run. I just felt an inner, irresistible urge to run, to move rhythmically and smoothly again.

There's something different in the running feeling now, though. It's a subtle difference, but a very pleasant one. Rather than super-efficiency in a stereotyped pattern, outside of which I'm limited by stiffness, I feel competence and ease in a wide range of movements. It's that “weightlessness” again, a natural, loose-swinging freedom. It feels as if running takes far less energy than it used to, and perhaps it actually does. Surely it must take less effort to move limbs well within their range of movement than in a narrow rut

which almost defines their range of movement. Of course, I don't know if the change is merely my imagination. We need more widespread experimentation before we can be sure of the effects of flexibility.

ADVANCED POSTURES

I stayed on Hittleman's "seven-week" course for five months, until I felt so comfortable with the 20 basic practices that I wanted to learn more. Looking around for a good guide, I found books offering six-, 12-, and 21-week courses, but none of them was exactly what I had in mind.

Finally, I found just the book I was looking for, B. K. S. Iyengar's *Light on Yoga*. Ironically, it was even more imposing than the books I had found so discouraging at the beginning. Now, however, I knew enough about hatha yoga to realize that it would assure me the most rapid progress.

It had a feature similar to Cooper's "point system" in *Aerobics*. All the asanas were given ratings from one to 60, according to the degree of difficulty. When I checked the asanas that I had mastered, expecting to find them in the 20-30 range (after all, I had at first thought them impossible), I was flabbergasted to find that they were rated only 1, 2, 3, or 4 at the most.

Light on Yoga had certainly enlightened me. I now realized that Hittleman's course, although an excellent introduction, was absolutely basic, like a YMCA beginning running program. Iyengar's book was of another order entirely, like having Bill Bowerman or Arthur Lydiard as a next-door neighbor and coach.

Light on Yoga must be the most complete guide to hatha yoga available. It has 602 photos illustrating 200 asanas and 15 pranayama (breath-control) techniques. Each asana is explained in great detail, with very precise instructions about the muscular stretches that should be experienced with correct practice.

Iyengar points out in his introduction that there are eight stages in yoga:

1. *Yama* (universal moral commandments);
2. *Niyama* (self-purification by discipline);
3. *Asana* (positions);
4. *Pranayama* (rhythmic control of the breath);
5. *Pratyahara* (withdrawal and emancipation of the mind from the domination of the senses and exterior objects);
6. *Dharana* (concentration);
7. *Dhyana* (meditation);
8. *Samadhi* (a state of super-consciousness brought about by profound meditation).

"Practice of asanas without the backing of yama and niyama is mere acrobatics," he states, "without the practice of the principles of yama and niyama, which lay down the foundation for building character, there cannot be an integrated personality."

I know most runners will be primarily interested in the physical benefits of the asanas, and will not be disturbed at lifting them out of context. It won't bother them to practice "mere acrobatics" as long as the practice

helps their running. However, since I've already referred to Hans Selye's work, which points out that needless stress can be eliminated by following his "philosophy of gratitude," I think I should bring this forward here.

Selye writes, "In an age so largely governed by intellect as ours, it is gratifying to learn that what religions and philosophies have taught as doctrines to guide our conduct is based on scientifically understandable biologic truths."

The biologic truths Selye here refers to are the activities of our glandular and nervous systems in response to stress. Yama and niyama are "doctrines to guide our conduct" which assure the optimum functioning of these stress-adaptive systems. Combined with asanas and the other stages of Yoga practice they produce a state of super-consciousness which radically transforms the individual into transcendent wholeness. This state is as available to persistent, disciplined practice as is superior cardiovascular power. Runners who have experienced extraordinary states of consciousness when in really top condition have felt a hint of what this transcendent wholeness is like.

The average modern man is far below his human potential. His very life-style dooms major areas of his body and mind to disuse and decay. A runner is far above the average: he reaches into the very cellular level of his tissues; his daily runs open vast networks of blood vessels to bring more blood, oxygen, and life to every cell. But unless he balances his life, he too dooms major areas of tissue to disuse and decay. A yoga runner learns to give life to his whole body. Daily, patiently, with persistence and determination, he returns to the effort of awakening *all* the tissues of his life—not just heart and lungs, but muscles, tendons, joints, glands, brain and nerves.

Yehudi Menuhin, the internationally famous violinist, is one of Iyengar's pupils. His life and his art were so profoundly transformed by Yoga that he gave Iyengar a ring, inscribed "To my greatest violin teacher." Now, the discipline of a top runner is nothing like the discipline of a violinist, but Yoga is reputed to release inherent potential so effectively that it produces excellence in any endeavor.

As far as we know, few runners, if any, practice yoga. It's interesting to speculate what would have happened if a great running talent had come under Iyengar's tutelage. Perhaps he'd have a ring inscribed "To my greatest coach."

In his foreword to *Light on Yoga*, Menuhin offers an image of yoga that should appeal to runners, devoted as they are to a spartan, simple, individual quest for excellence: "Yoga, as practiced by Mr. Iyengar, is the dedicated votive offering of a man who brings himself to the altar, alone and clean in body and mind, focussed in attention and will, offering in simplicity and innocence not a burnt sacrifice, but simply himself raised to his own highest potential."

RUNNING APPLICATION

Of course, yoga will be for you exactly what you make it. If this holistic view of its meaning does not appeal to you, you can still benefit greatly from the "mere acrobatics" of the asanas. These positions, developed and tested over several thousand years, constitute the most sophisticated and comprehensive system of body culture ever known.

The asanas I demonstrate here are straight from *Light on Yoga*. If you're familiar with the basic asanas described in the popular books, you'll notice that several of them are missing. That's because Iyengar's course (which covers 300 weeks—almost six years!) is designed for people who are seriously interested in the science. The asanas are given in an order corresponding to the optimum sequence of development of the body. They are far more strenuous than the popular asanas, and the advanced poses demand and develop exceptional strength. I mention this to dispel the widespread notion that yoga is a discipline for flexibility alone.

Coincidentally, the asanas ideal as starters for runners—the standing asanas—are emphasized at the beginning of the course. As Iyengar points out, “mastery of the standing poses prepares the pupil for the advanced poses in forward bending, which can then be acquired with ease.” The advanced poses in forward bending involve intense hamstring stretches, so these preparatory poses are excellent ways of countering hamstring tightness.

You might think that the advanced poses will be of no value to you, but I think this is a mistaken view. When we're at the very beginning of the trail to fitness, we might find alternate walking and slow running valuable, but once we're in shape, they are a waste of time. The same principle holds good in the practice of yoga.

As Iyengar says, “All these intricate and difficult postures bring results quicker than the simpler ones. When the body becomes more pliable, the simple poses will have little or no effect. The wise will therefore discard them and practice the intricate poses just as the scholar will not repeat the alphabet daily.”

The asanas which follow are only the alphabet, and yet you'll probably find them far from easy. Don't be discouraged. No matter how stiff you find yourself to be in the beginning, flexibility will reward regular practice in yoga as surely as endurance rewards regular running. If you practice in the morning, the asanas will be harder because your body will be stiff from the night's sleep. If you practice in the evening, they are easiest, but you might find it more difficult to summon the necessary will and concentration. If it's more convenient for you, the practice can be broken into two or three periods per day.

Experiment with the asanas before and after running, and you'll have an unforgettable demonstration of just how stiff a run can leave you. You'll also be able to work out a convenient sequence to stretch your hamstrings at the end of each run. At the moment, the only asana I do after running is a forward bending one, in which I bend over slowly, letting my arms hang down, and then wait for the weight of my trunk to stretch out my hamstrings until I can comfortably rest my palms flat on the ground beside my feet. This usually takes from two to three minutes so I don't start until my breathing is slow. I put in this brief pause because I think (I don't know for a fact) that this prolonged inversion of the trunk should wait for the return of normal circulation.

I wish I could give more specific advice on the application of yoga to running. Our research has shown that there has been very little work, formal or informal, in this area. This booklet is only a starting point for further exploration. We would appreciate any comments you have.

18-WEEK YOGA PLAN

I have selected the asanas that seem to me to be excellent for runners. Since I am a beginner, my range of choice is severely limited. There are several advanced poses that Iyengar specifically recommends for runners. Of one of these, *hanumanasana*, he writes, "This pose helps to cure sciatica and other defects of the legs... and if practiced regularly is recommended for runners. It relaxes and strengthens the abductor muscles of the thighs." The only problem is, the pose has a difficulty rating of 36, so I cannot demonstrate it for you. It's the kind of thing we can keep in mind for later, when these basic positions have long ago been discarded for more intense stretches.

The sequence suggested here should be patiently observed. The time to be spent on each section is a *minimum*. If you want to, you can spend months rather than weeks. You don't have to achieve the final positions of one section before going on to the next, but you should not move on until you feel reasonably comfortable and competent.

You'll notice the sanskrit names of the poses. I do this as a reminder that hatha yoga is radically different from the forms of exercise that we are familiar with. I find that repeating the sanskrit name of the pose before doing it helps to get me in the right frame of mind. My pronunciation is probably all wrong, and I often have to refer back to the book to check myself, but (for me at least) this little ritual is a transition to concentrated attention.

You'll probably find yourself very stiff and sore in the beginning. I think it takes a few painful experiences to learn a healthy respect for these powerful stretches, so you should look upon your early problems as a helpful part of your progress. Don't hesitate to take a few days off whenever you overdo things. It might even be a good idea at first to take a day off each week. I find that an occasional day of doing only the easiest poses seems to bring faster progress.

You'll find the "alphabet" on the following pages. Why not start right now? Stay on each section for at least three weeks. You should never feel you are taking on more than you can handle. If you practice regularly and patiently, you'll amaze yourself. In a few months time, you'll find it hard to believe that these asanas once seemed difficult.

Section I—asanas 1 through 7

Section II—asanas 1 through 9

Section III— asanas 1 through 12

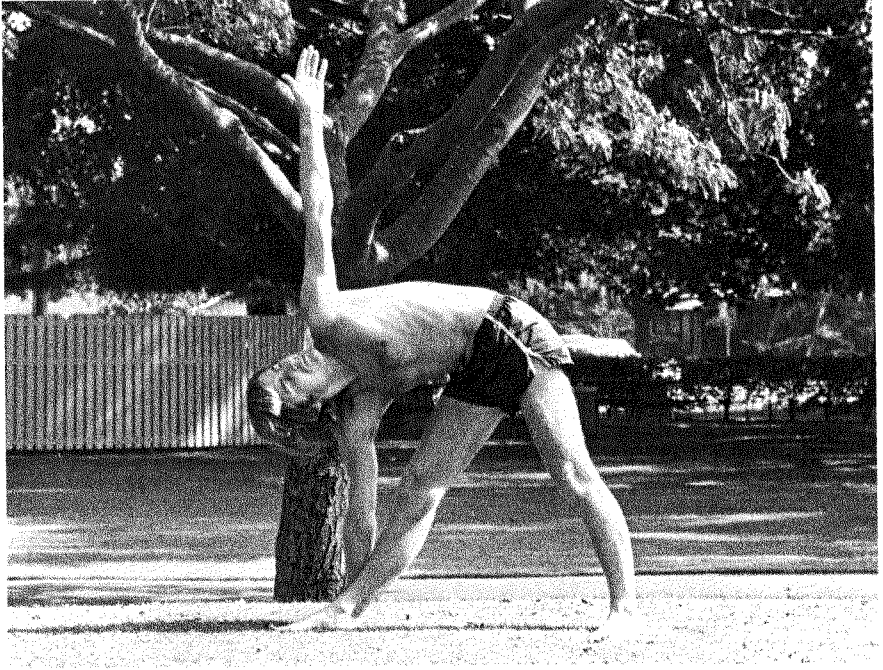
Section IV—asanas 1 through 14

Section V—asanas 1 through 15

Section VI—asanas 1 through 16

1. TRIANGLE POSE

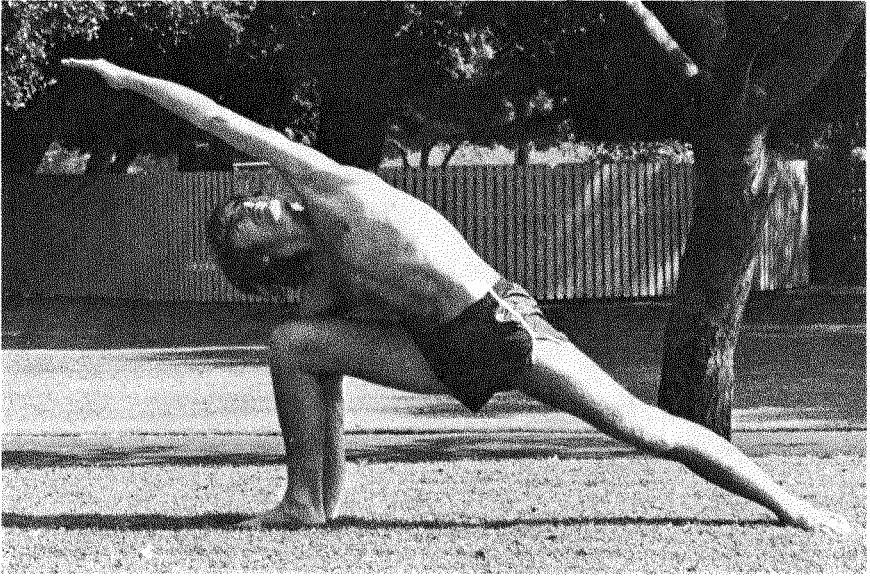
Photos by George Beinhorn



UTTHITA TRIKONASANA — Difficulty level-3.

- Legs 3-3½ feet apart. Arms straight out from shoulders, palms down. Turn right foot 90 degrees to right, left foot slightly to right.
- Exhale. Bend to right. Place right palm flat on floor next to right ankle. Stretch left arm up in line with right. Turn head as far as possible and gaze at outstretched left thumb. Keep both knees locked by pulling up knee caps.
- Hold position 30-60 seconds, breathing deeply and evenly.
- Lift hand from floor, inhaling on return to starting position. Repeat.

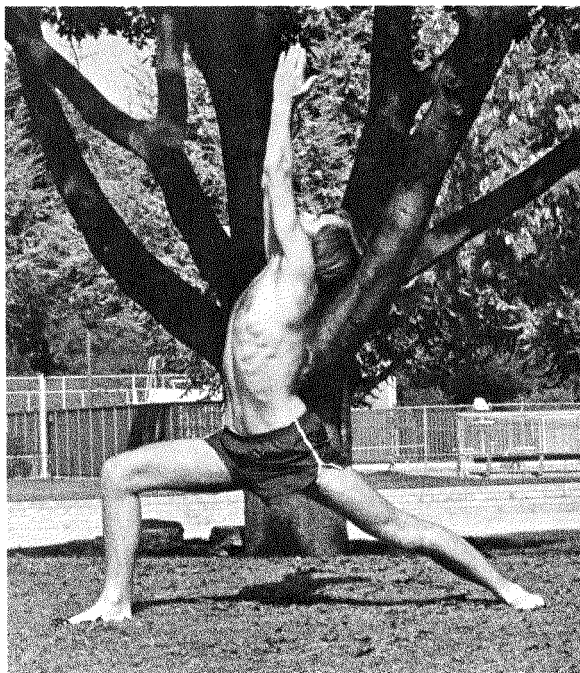
2. SIDE STRETCH



UTTHITA PARSHVAKONASANA – Difficulty level-4.

- Legs 4-4½ feet apart. Arms extended straight out from shoulders, palms down. Turn right foot 90 degrees to right, left foot slightly to right. Bend right leg to form right angle, thigh parallel to floor.
- Exhale. Place right palm on floor alongside right foot. Arm-pit covers and touches outer side of knee. Stretch and straighten left arm out over left ear. Keep eyes on left elbow. Move left arm to right. Stretch so that you feel the skin being pulled tight.
- Hold position 30-60 seconds, breathing deeply and evenly.
- Come up from pose with inhalation. Repeat on other side.

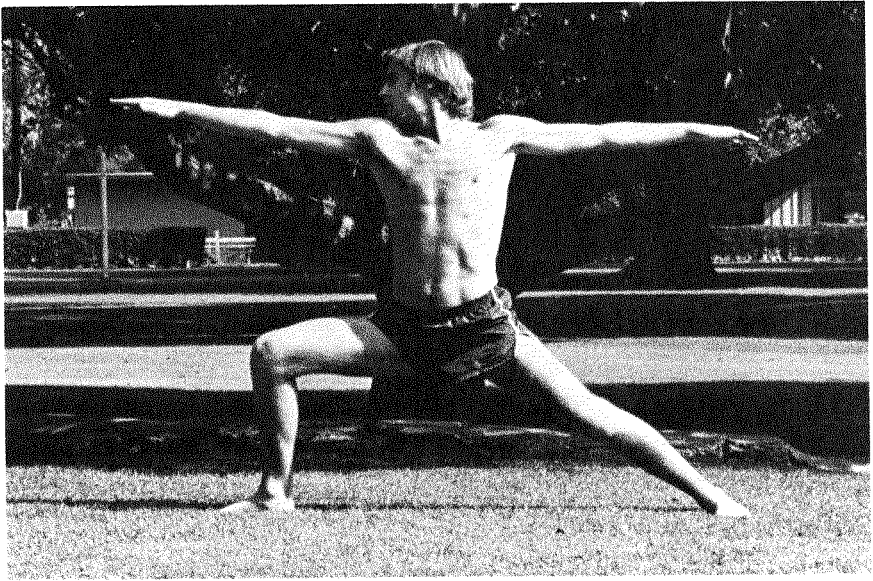
3. FENCER'S POSE I



VIRABHADRASANA I – Difficulty level-3.

- Legs 4-4½ feet apart. Stretch arms above head, join palms. Turn right foot 90 degrees to right, left foot slightly to right. Bend right knee to form right angle. Stretch left leg and tighten knee.
- Exhale. Twist body as far as possible to right, to face in same direction as right foot. Stretch spine and arms. Throw head back. Gaze at palms.
- Hold 20-30 seconds with normal breathing.
- Exhale. Return to starting position. Repeat on other side.

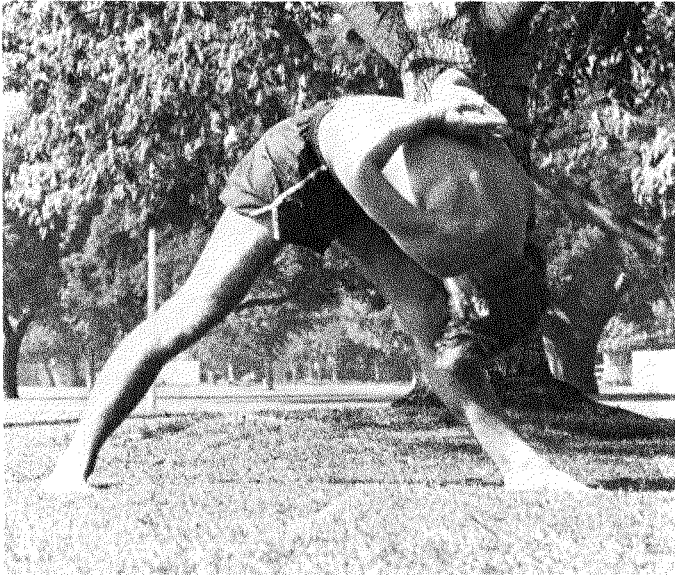
4. FENCER'S POSE II



VIRABHADRASANA II — Difficulty level-1.

- Legs 4-4½ feet apart. Stretch arms straight out. Turn right foot 90 degrees to right, left foot slightly to right. Bend right knee to form right angle. Stretch left leg and tighten knee.
- Exhale. Stretch arms hard as if two people are pulling them in opposite directions. Gaze at right hand.
- Hold 20-30 seconds with normal breathing.
- Exhale. Return to starting position. Repeat on other side.

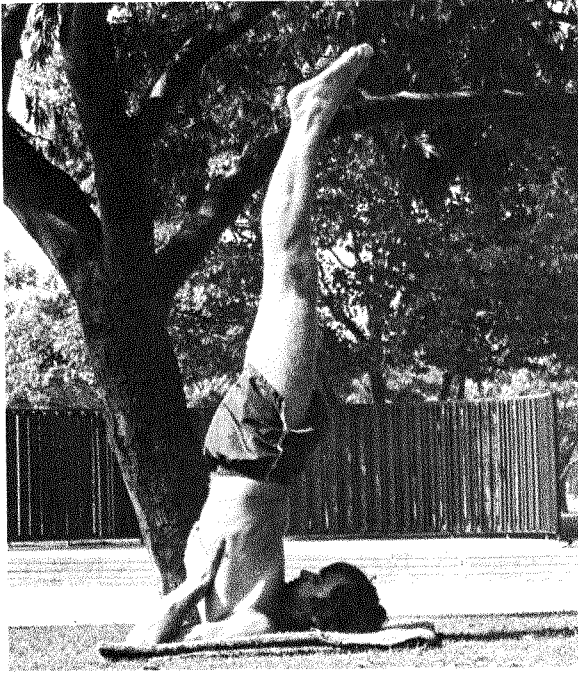
5. INTENSE SIDE STRETCH



PARSHVOTTANASANA — Difficulty level-6.

- Feet 3-3½ feet apart. Palms together behind back. Twist arms, bring fingers up between shoulder blades (or hold one wrist with other hand).
- Inhale. Turn trunk to right. Turn right foot 90 degrees to right and left foot 75-80 degrees to right. Keep both legs straight and tightened at knee. Exhale. Bend trunk forward, try to rest forehead on knee. Keep both knees tight.
- Hold 20-30 seconds with normal breathing.
- Inhale. Straighten. Repeat on other side.

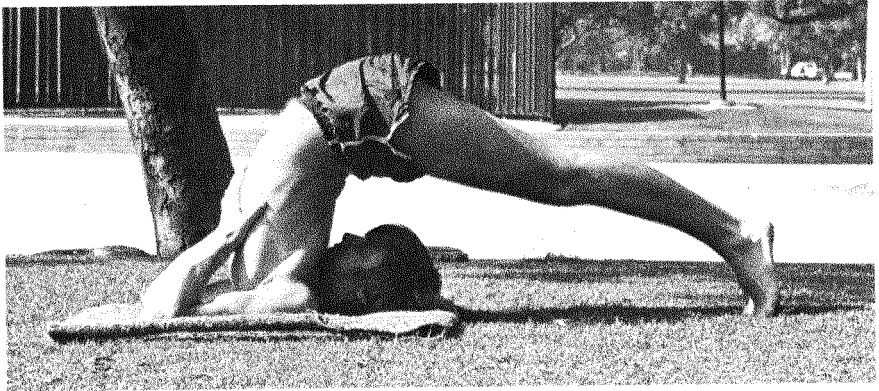
6. SHOULDER STAND



SALAMBA SARVANGASANA — Difficulty level-2.

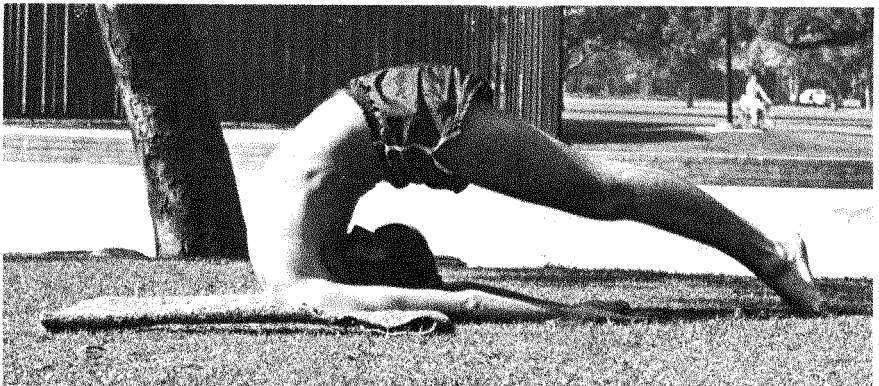
- Lie flat on back (on carpet or mat). Stretch legs, tighten knees. Hands, palms down, by side of legs.
- Exhale. Bend knees, bring thighs up to rest on stomach. Lift hips off floor with exhalation, support them with hands. Exhale. Stretch legs straight up. Move the trunk to the verticle position, and the hands from the hip support to the final position shown.
- Hold position 5 minutes with even breathing.

7. THE PLOUGH

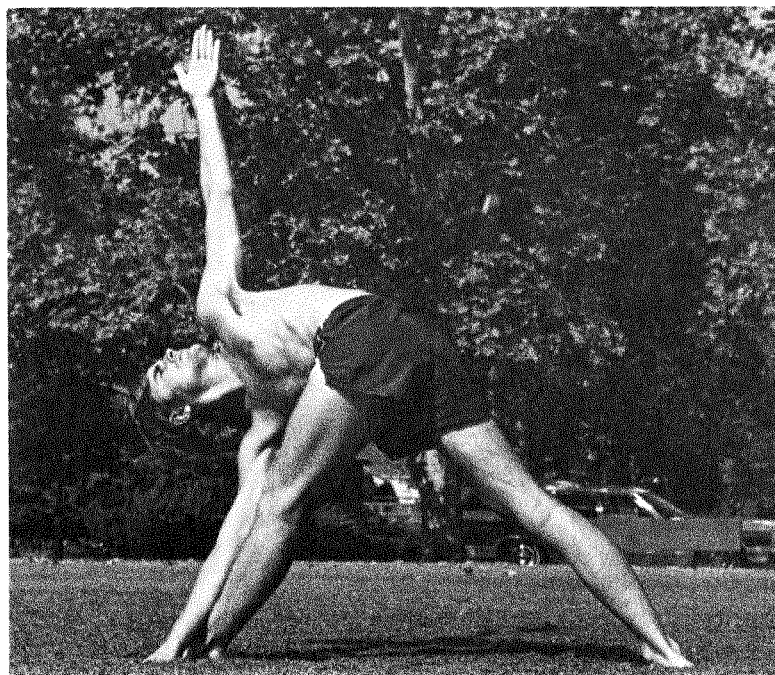


HALASANA — Difficulty level-4.

- Do asana 6 (Shoulder Stand) with firm chinlock against chest. Release chinlock. Lower trunk slightly. Move legs over head, letting feet drop until toes touch floor.
- When toes touch floor, tighten knees and raise trunk to perpendicular position with support of hands (above photo; below—alternate arm position).
- Hold position 1-5 minutes with normal breathing.



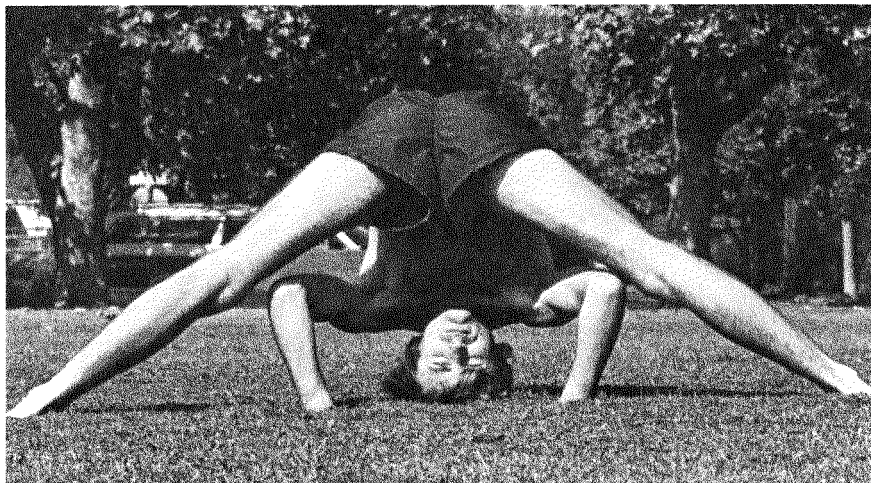
8. TWISTED TRIANGLE



PARIVRITTA TRIKONASANA — Difficulty level-5.

- Legs 3-3½ feet apart. Arms extended straight out from shoulders, palms down. Turn right foot 90 degrees to right, left foot 60 degrees to right.
- Exhale. Rotate body to right. Bring left palm to floor near outer side of right foot. Stretch right arm up and gaze at thumb.
- Hold position 30 seconds with normal breathing.
- Inhale. Lift palm from floor, return to starting position. Rest if necessary. Repeat on other side.

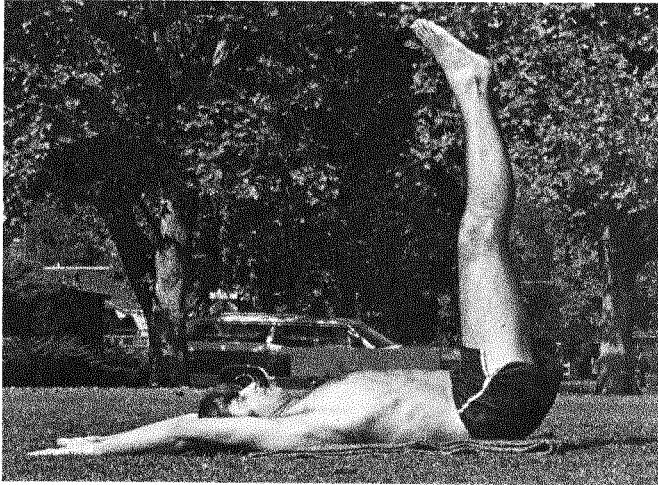
9. HANGING STRETCH



PRASARITA PADOTTANASANA – Difficulty level-4.

- Inhale. Place hands on waist. Legs 4½-5 feet apart. Tighten legs by drawing up kneecaps. Exhale. Place palms on floor between feet and in line with shoulders.
- Inhale. Raise head up, trying to make back concave. Exhale. Bend elbows. Let trunk hang down so that crown of head rests on floor keeping body weight on legs.
- Hold position 30 seconds, breathing deeply and easily.
- Inhale. Raise head, straighten arms, try to make back concave. Inhale. Stand.

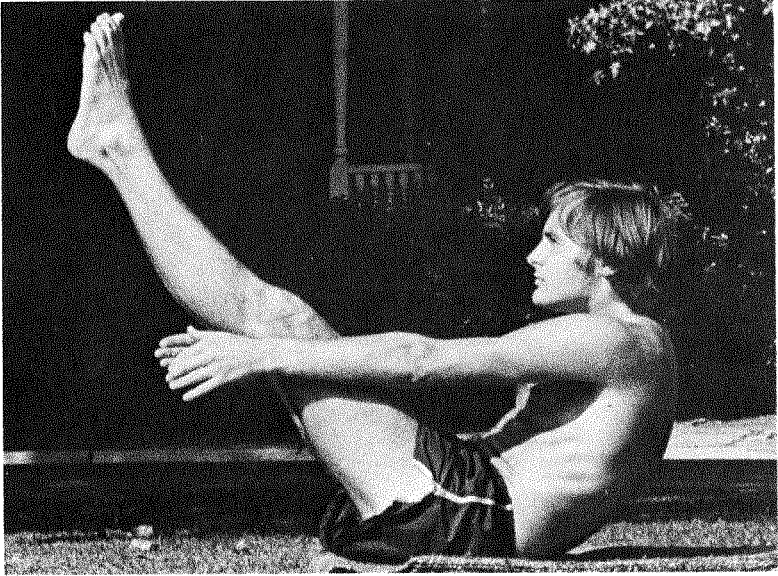
10. LEG LIFT



URDHVA PRASARITA PADASANA – Difficulty level-1.

- Lie flat on back. Legs stretched out and tightened at knees. Arms stretched straight over head.
- Exhale. Raise legs to 30-degree angle. Hold for 15-20 seconds with normal breathing.
- Exhale. Raise legs to 60 degrees. Hold for 15-20 seconds with normal breathing.
- Exhale. Move legs to perpendicular. Hold 30-60 seconds with normal breathing.
- Repeat 3-4 times.

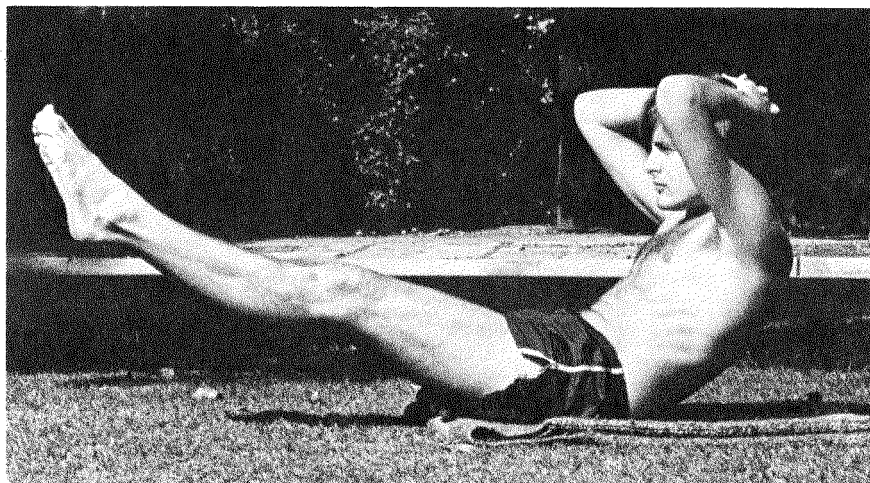
11. THE ROWBOAT



PARIPOORNA NAVASANA — Difficulty level-2.

- Sit on floor. Legs straight, knees tightened. Palms by hips, fingers pointing forward. Back as erect as possible.
- Exhale. Lean trunk slightly back and at same time raise legs from floor, keeping them tight. Balance on buttocks, legs at 60-65-degree angle. Stretch arms out parallel to floor, palms facing each other.
- Hold 30 seconds with normal breathing.
- Exhale. Lower hands, then legs. Relax by lying on back.

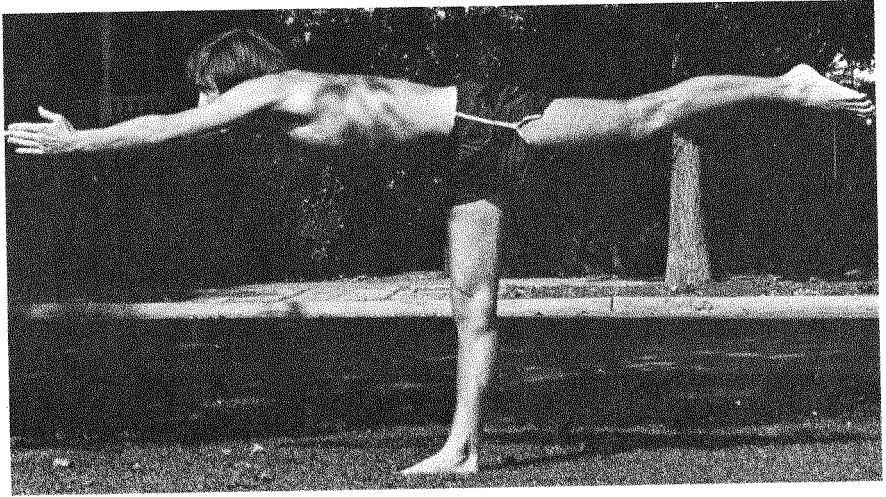
12. THE CANOE



ARDHA NAVASANA — Difficulty level-2.

- Sit on floor. Legs straight, knees tightened. Back as erect as possible. Interlace fingers behind head.
- Exhale. Recline trunk back and raise legs, keeping toes pointed and knees tightened. Keep legs at 30-35-degree angle, toes level with crown of head.
- Hold 20-30 seconds with normal breathing.
- Lower trunk and legs. Relax by lying on back.

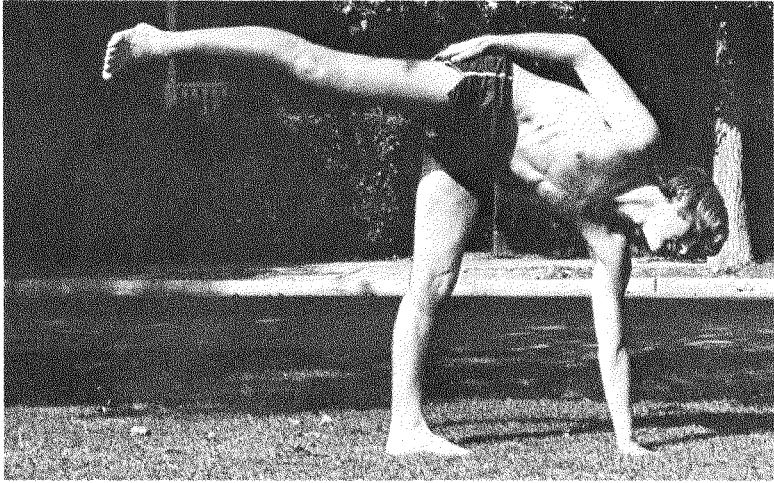
13. STORK STRETCH



VIRABHADRASANA III – Difficulty level-5.

- Legs 4-4½ feet apart. Stretch arms above head, join palms. Turn right foot 90 degrees to right, left foot slightly to right. Bend right knee to form right angle. Stretch left leg and tighten knee.
- Exhale. Bend trunk forward, rest chest on thigh. Keep arms straight and palms together. Rest in position, taking two breaths. Exhale, lifting back leg by swinging body slightly forward. Straighten support leg and tighten knee.
- Hold 20-30 seconds with deep, even breathing.
- Repeat on other side.

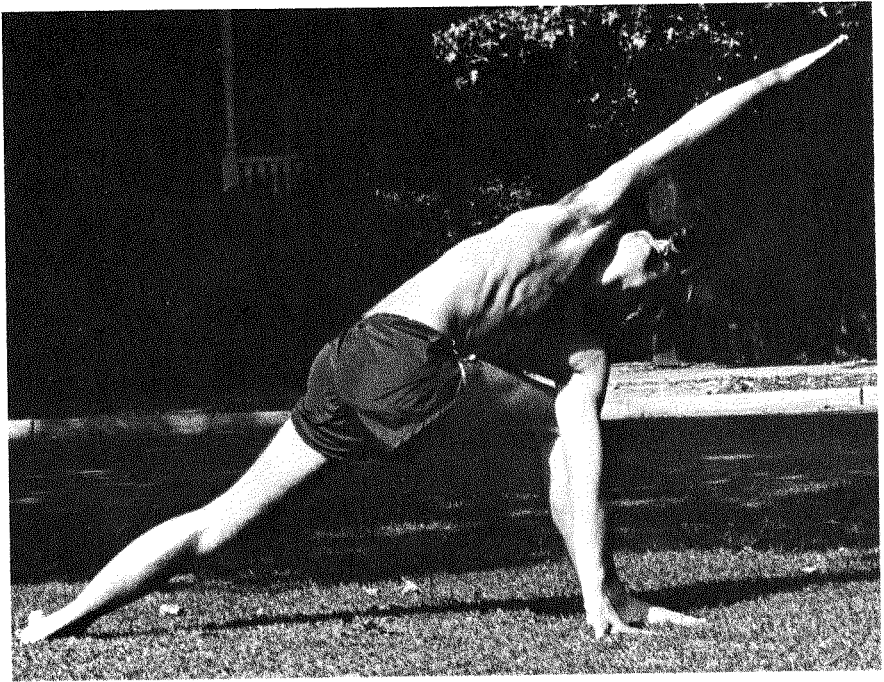
14. HALF-MOON POSE



ARDHA CHANDRASANA — Difficulty level-5.

- Legs 3-3½ feet apart. Arms extended straight out from shoulders, palms down. Turn right foot 90 degrees to right, left foot slightly to right.
- Exhale. Place right palm about a foot from right foot by bending knee and bringing left foot closer to right. Wait in position, taking two breaths. Exhale. Raise left leg from floor, keeping toes pointed and lifting left leg as high as possible. Place left palm over left hip and stretch up. Bear weight of body on right foot and hip, using right hand only as support to aid balance.
- Hold 20-30 seconds, breathing deeply and easily.
- Slide left leg to floor. Stand. Repeat on other side.

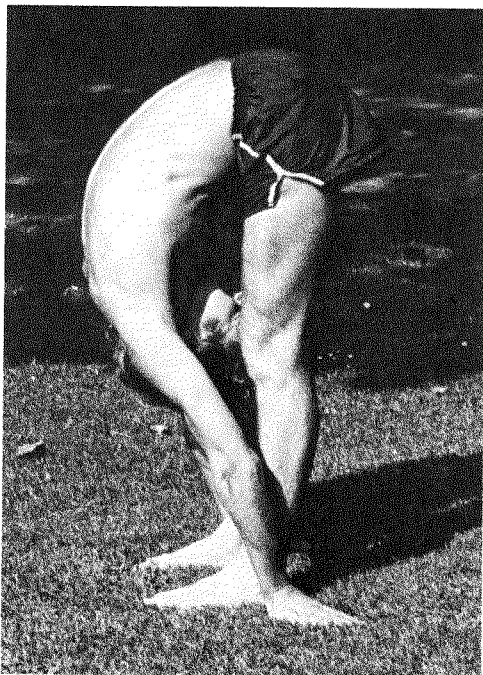
15. TWISTED SIDE STRETCH



PARIVRITTA PARSHVAKONASANA — Difficulty level-8.

- Legs 4-4½ feet apart. Arms extended straight out from shoulders, palm down. Turn right foot 90 degrees to right, left foot 60 degrees to right. Bend right leg to form right angle, thigh parallel to floor.
- Exhale. Bring left arm over knee. Rest left armpit on outer side of knee. Place palm on floor by outer side of foot. Give spine a good twist to right. Bring right arm over right ear. Gaze at outstretched arm. Keep left knee tight throughout.
- Hold position 30-60 seconds, breathing deeply and evenly.
- Repeat on other side.

16. HAMSTRING STRETCH



PADANGUSHTHASANA — Difficulty level-3.

- Legs one foot apart. Exhale. Bend forward. Grasp big toes between thumbs and first two fingers. Keep head up and make back as concave as possible.
- Stretch down from hips, trying not to bend upper back or stretch shoulders. Take two breaths. Exhale. Bring head between knees by tightening knees and pulling toes without lifting them from floor. (The position shown is an advanced variation.)
- Hold position 20 seconds with normal breathing.
- Inhale. Relax grip on toes. Stand.

Chapter III

STRENGTH



Bil Canfield

EXTREMES OF FITNESS

BY CHARLES PALMER

Chuck Palmer, the chief writer-photographer for this chapter, has been to the apparent extremes of athletics—from competitive weight lifting to competitive running. After giving up serious lifting in disgust over drug-taking practices in the sport, he turned to running and found the weights had an important function there, too.

I don't recall just what inspired me to send away for a set of barbells when I was 14. But I know it wasn't the sight of some over-upholstered body-builder on the back of a comic book, daring me to be a man. Maybe it was the recollection of the rather lean weight-lifter on a TV newsreel years earlier, hoisting an enormous weight overhead in two quick, casual motions, only to momentarily lose control of the weight and step out from under it with equally casual aplomb, the weight crashing to the platform, the lifter dancing back, unhurt, undaunted.

After two years of using that first set of weights in my basement, hoping to get strong enough to make the first strain in wrestling, I went to a gym instructor to get a specific wrestling program. He told me I'd have a better chance to excel in Olympic lifting than wrestling because of my heavy bone structure and the good strength in my legs and back. ("Olympic" lifting refers to a *style* of lifting, not to the competition every four years that is most people's only glimpse at this sport.) I believed him.

The recollection of the flashy performer on the newsreel from my childhood became more vivid as I plunged into the "iron game." After a couple of years of specializing on this most unsung sport, I reached a point where I could clean (shoulder) and nearly jerk (put overhead to arms' length) 290 pounds. This was still more than 100 pounds below the world record in my weight class (165 pounds), but I was considered promising.

Then I learned that anyone who lifted much better than that was taking "The Pill"—anabolic steroids. This is a drug developed to spur growth in youngsters who are growing too slowly and to aid protein assimilation in older people who have one foot in the grave and the other on a banana peel. When I found that lifters had been using steroids for nearly 10 years (with shot put, discus and hammer men following soon after), I decided to return to training for fitness and feeling good (it *always* felt good to lift weights) instead of becoming a private drug experiment. This I did on a rather irregular basis while teaching a course in basic weight training at the college I was attending.

Partly in search of a different kind of fitness, partly because of lucid articles in *Playboy* and the *New York Times*, I began to run around a nearby golf course. I became an unconscious "fun-runner" before anyone could tell me that my 165 pounds (even if I was still rather muscular) when carried on a 5'7" frame would limit performance over any distance longer than a quarter-mile.

When I ran across *Runner's World*, it was a joy to find kindred souls who actually came out with a magazine about all this—a *monthly* yet! Finding out I had a ponderal index of 12.2 (this is a relationship of height

to weight; most good distance runners are above 13) was somehow less insulting than the necessity to ingest steroids, and within a few months I decided I wanted to follow the original inspiration and run a marathon myself.

And a strange thing happened. After fighting my way up to 50 miles a week, seemingly getting the "injury of the month" almost in sequence with the articles in *RW*, I found that if I combined just a few stretching exercises (chosen to condition the special muscles which were affected by running), I could increase my mileage and not be burdened by that nasty trail of little injuries—aches and pains that served as excuses to avoid training, or, worst, made me doubt the value of running itself.



Bil Canfield

LIFTING THE MYTHOLOGY

When asked to prepare the strength-training section of this book, I was at first flattered and then apprehensive. Hadn't it all been said before, and better? John Jesse's excellent *Strength, Power and Muscular Endurance for Runners and Hurdlers* came to mind, and I ran across a number of other excellent works as I dug into the literature of strength training for athletes.

Then it occurred to me that beyond a description of a few basic exercises, what was needed most was a general "demythologizing" of the many popular notions surrounding weight-lifting. Judging from the reaction I had received in the past when I was exposed as "one of those weight-lifters" and the overabundance of pernicious falsehoods circulating about strength training, it was something that was much more urgently needed than merely another description of exercises. The magnitude of my personal ire about the situation, coupled with my experience as a lifter, qualified me for the task.

First, we should distinguish between body-builders, Olympic- and power-lifters, and weight-trained athletes:

- Body-builders seek to maximize muscular size and definition through training that yields strength only as a by-product.

- Olympic-lifters train to maximize their performance on two lifts: the snatch (one motion from the floor to arms' length overhead) and the clean and jerk (one motion to the shoulders, followed by a jerk to arms' length overhead). A third lift, the press, was dropped after the 1972 Olympics because the style of its performance had grown progressively looser through the years, and it was impossible to judge consistently.

Power-lifters specialize in raw strength in the performance of the deep knee-bend, bench press and dead-lift, and are not overly concerned with style, speed or flexibility.

- Weight-trained athletes use any form of progressive resistance exercise to improve their ability in a particular sport.

With this understanding, let's talk about the myths and misconceptions that have clouded the minds of non-weight-users concerning this activity.

1. *Weight-lifters are ponderous and massive (maybe even fat), or grossly over-muscled.*

This misconception is the most galling of all to address, mainly because it would be so easy to correct if the TV and other media would realize what they have done and then correct this state of affairs.

There are nine classes in Olympic lifting (and as many in power-lifting), ranging from 114 pounds through 198, 242 and unlimited. But even during Olympic coverage, we rarely see any except the last two. Maybe it's because the bar bends more when the heavies lift (only a little more, though; the lighter classes are often within 50 pounds of the 500-plus jerk of the super-heavyweights), or maybe they feel the sight of a 350-pound behemoth is more entertaining than that of a 114-pound flyweight efficiently handling close to three times his weight. Whatever the reason, the media continue to promote the pre-1900 image of the strongman as slob.

The latest Olympic movie, *Visions of Eight*, perpetuates the same stereo-

type, even through the eyes of woman filmmaker Mai Zetterling. Instead of slow side shots that could show a little of the grace and beauty of even the heaviest lifters, we are treated to close crops of contorted, fleshy faces and huge weights dropped in disgust. All this becomes nearly unbearable to anyone familiar with the sport, just as cliché photos of "agonizing" marathoners offend runners who love their sport.

The "gross" display of musculature we witness on Mr. Universe appearing on the Johnny Carson show is more out of context than a misrepresentation. The point here is that such extreme muscularity takes years to attain, couldn't happen by accident and is only seen when such a display is intended (all the muscles flexed simultaneously). In suit and tie, or even in a tee-shirt, most body-builders look substantially more normal.

If any runner still fears such a fate might "accidentally" befall him, I give you this quote from John Jesse:

"Many track athletes have been led to believe that heavy resistance training automatically results in a large growth of muscle size. They fear that large muscles will hamper their speed and endurance development. Inherent body characteristics limit the amount of muscle or body size that can be developed.

"Ability to acquire large muscles is dependent to a great extent on the quantity of food intake, large amounts of sleep and rest, and a specific type of resistance exercise used by body-builders that builds large muscles and total body weight, with a relatively small increase in strength.

"The author (Jesse) has never seen a runner or hurdler, who has worked with weights, develop muscles of great size as long as he participated in the type of endurance training required of him for success in his chosen event."

2. *Weight-training makes you "muscle-bound."* If by muscle-bound we mean inflexible, this is patently false and in most cases is the opposite of the effect we can expect. At the peak of my competitive lifting, I was also the most flexible I've ever been, and was able to touch about 12 inches below my toes when standing on a bench.

Sam Loprinzi, who has lifted weights for more than 45 years and has been named Most Muscular Man and runner-up for Mr. America, can touch his head to the floor while sitting in a full split position. John C. Grimek, who lifted for the US Olympic team in 1936 and won Mr. America and Mr. Universe awards years later, could walk stiff-legged with his elbows touching the floor. At the peak of his career, with legs larger than the size of his contracted waist, Grimek could arch backwards into a handstand from a full split.

These are not rare exceptions but are typical of the total fitness these men strived for through weight training. With the elimination of the press from the Olympic lifts (and resulting elimination of the lower-back problems caused by the extreme backbend the press required), the modern lifter is getting slimmer and more flexible.

Yet a highly-paid *Sports Illustrated* writer recently misinformed his readers that a world record-holding Bulgarian lifter's elasticity is "unusual among lifters." Baloney! Such efforts are *due* to flexibility, and this flexibility is acquired through proper strength training, not despite it.

3. *Weight-training hinders running speed or speed of reflexes.* Both assumptions are false. An extreme example was Paul Anderson, the 375-pound Dixie Derrick who could run 100 yards in the 11's at this weight (some of which definitely was surplus). Numerous lighter lifters show much faster times, and strength training is now an accepted part of the program used by many sprinters to develop explosive starts and sustained drives.

In the area of reflexes, strength is seen to quicken them according to tests performed on different types of athletes by the US Army at the 1956 Olympics. Careful testing of the involved athletes clearly proved that a weight-lifter had by far the fastest reflexes of those competing in any sport, and that most of the weight-lifters were considerably faster than non-lifters. As is the case of flexibility, strength training does no harm to (and probably enhances) reflexes.

4. *Weight-lifting is bad for women.*

This is an easy one. I could cite the long tradition of weight-training among girls competing in the California beauty contest circuit or go into the physiological explanations involving differences of male and female hormones, but I'll simply cite a much more staid, mundane source—*Parade Magazine*. Reporting on experiments conducted by University of California exercise physiologist Jack Wilmore, *Parade* ran a feature article titled "Weight Lifting is for Women, too."

In a test covering 10 weeks, with each girl lifting weights in basic exercises for one hour three times a week, strength gains were reported for all subjects, ranging from 20-50%. The size of waists, hips and buttocks was reduced while bust size increased slightly—all positive results for women in American society. No change was reported in arm size or weight. The application to women runners is obvious. Unlike men, they don't even have to worry about gaining muscular bulk, while they can enjoy similar benefits from increases in strength.

5. *Weight-lifters turn to flab when they quit working out.*

It didn't happen to me. My weight has been stable at 165 pounds over the last eight years. During a layoff, my arms and legs got slightly smaller, my waist would increase by about an inch. This problem seems to be more a function of diet than exercise, and though muscle tissue can atrophy with lack of use and be replaced by fat, it is never a question of muscle turning to fat. Large muscles don't seem to lose very much tone if diet is adjusted to activity.

If I've established my point that strength training is not harmful to runners, I must go on to tell why it is a helpful—maybe even an essential—addition to their training.

To quote from *Sports Illustrated's Book of Track and Field: Running Events*: "We have said repeatedly that the best training for running is *running*. But there comes a time for every runner when an hour or so of weight lifting a week will do him more good and make him a better runner than another hour of running."

Here is the main reason why: *balanced development can't be had by running alone.*

Running does very little to develop the upper body. Upper body power

is obviously needed for the explosive sprint and hurdle events. And it can be very helpful at the end of longer races.

Dave Wottle, not overly muscled by any means at 6'0", 140 pounds, is noted for his fine kick. Kenny Moore's 1973 *Sports Illustrated* article on Wottle makes the connection between his upper body strength and this strong kick: "His arms drop lower, and his surprising strength of torso (he can bench-press 180 pounds) churns him into another gear. 'The key is the arms,' he says. 'When I kick, all I do is concentrate on driving with my arms.'"

In the longer races like the marathon, upper body condition can pay off in the last miles of the race by reducing fatigue in the arms and shoulders, which can force the runner to slow his pace.

Running develops the legs, but in a very narrow way. The front of the leg gets proportionately stronger than the back of the leg, which increases chances for injury during unaccustomed stress. Another factor that can lead to injury is the fact that the leg is never fully straightened during running. (Motion studies show this, and the effect is more pronounced at a distance pace than in a sprint.) The result is a stiffness along the back of the leg, manifest in varying degrees from the buttock to the achilles tendon. Strength and flexibility training with emphasis on complete movements with full contractions can counter this tendency to stiffness while building power.

Finally, the vital midsection is best developed with vigorous calisthenics or progressive weight training.

Though anyone can profit from strength and flexibility training, it appears to become increasingly valuable with age, older people needing it more and seeing the preservation effects of such training more readily.

Now that I've had this partisan moment to defend the use of weights, I feel better about talking of the specific methods of weight training.

-CHARLES PALMER

A PROGRAM FOR RUNNERS

Rather than give examples of programs that famous runners have used, it is more valuable for the individual runner to evaluate what parts of his body need work and to give enough exercises and variations so he can design his own program in a sensible manner. Weight-lifters have long known that using a great number of exercises and variations produces better results than using a few motions repeatedly. Variety also tends to make training more enjoyable, of course.

The exercises that follow are listed according to the general body parts they affect, with variations noted where important. But, first, some general advice:

- **Equipment:** Except for two exercises, the only equipment needed is a barbell set (with adjustable dumbbells), a situp board, and stools or boxes (the board and boxes can be combined to make a bench needed for some movements). A 100-150 pound weight set is fine for a start. An iron set is preferable to the sand-filled plastic type, which is more bulky and wears out. Total cost will be comparable to that of a good pair of running shoes.

- **How often?** Two or three workouts a week is best, depending on how you react to the work load. Once a week is okay, but progress will be slower.

- **How much weight?** No one can say what you *should* do in each exercise. You'll determine this easily by experiment. For the first month, if you've never tried lifting weights before, you should stay very light and be more concerned with proper form than with how much you can lift. After this starting period, you should lift so you never have to strain to complete the number of repetitions you plan to do. Increase the weight when the poundage becomes easy, generally going up no more than five pounds at a time. Five percent every two weeks is a rough guideline to follow. Work hard but don't strain.

- **Breathing:** Breathe once per repetition, generally exhaling as the effort is performed but in the opposite phase if it feels better. Don't hold your breath longer than one repetition.

- **Number of exercises, sets and repetitions:**

Exercises—Do from 5-10 per session, depending on how much time you can spend and how you react to the work. If you need more than the number you can do in a single session, split the schedule and repeat any exercises you feel are particularly important.

Sets—Aim for three per exercise with at least two sets per exercise, and up to four or five where you are weak.

Repetitions—This is an area where your own experiments are as important as the recommendations given with each movement. Low reps build power, high reps build endurance, but there is considerable overlap. Also, "high" and "low" are relative terms that may vary with the exercise.

You may choose to do all sets with the same number of repetitions or add weight to successive sets as you drop the reps (12-8-5 is a popular variation). Start each exercise with a set using a lower weight than you can normally handle for a given number of reps.

- **Sequence and rest pauses:** I favor running through each exercise com-

pletely before moving to the next, using one to two minutes rest between light exercises (for arms, shoulders, waist) and two to three minutes (or more as required) for heavy lifts involving large muscles (leg and back movements). However, I often run through the routine in cycles, moving from one exercise to the next with little rest between sets since the area being worked can recover during the work of the next exercise. This shortens the time spent per workout. Find what suits you best.

- **Boredom or stagnation at a certain weight:** Vary the exercise with a different hand spacing, a reverse grip, or a different angle where this can be done. Vary the repetitions or sets if you find yourself going stale in a certain movement.

- **When to exercise:** Don't weight-train on days of very long runs or other hard running workouts. Upper body training can be done just prior to or after your regular running. Leg and back work should follow a running workout or precede it by several hours at least. Try to schedule a lifting workout no sooner than 1½ hours after a meal; finish no later than 30-45 minutes before big meals.

- **Dumbbells vs. barbells:** Some exercises favor the use of one over the other. Some have value when performed at different times using both types of weights. Barbells build basic strength. Dumbbells force smaller supplementary muscles to work with larger, stronger muscles in coordinating the movement.

- **Warmup/substitute for weights:** Calisthenics are good for use in warming up for weight training, and there is a graduated program of these exercises that makes a fine five-minute warmup or temporary conditioning exercises when you don't have access to weights. This is contained in the *Royal Canadian Air Force 5BX/XBX* program for men and women, available cheaply in paperback. Use this in the progressive manner described and you will be warmed up adequately for any weight training workouts, or you will retain fitness when you are unable to work out with weights.

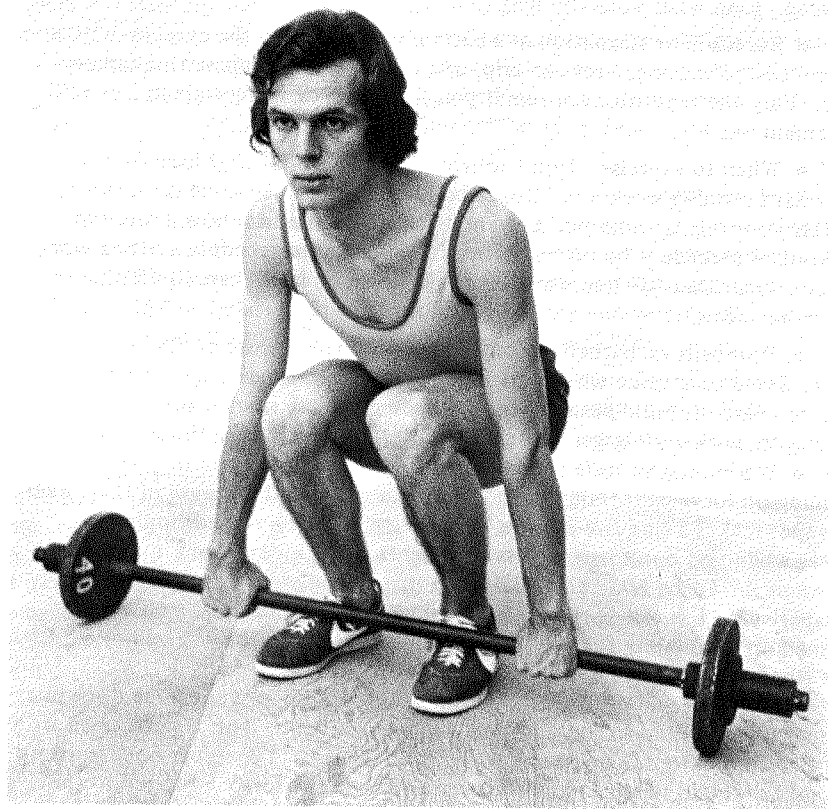
One calisthenic exercise that requires no equipment yet can be done in a manner highly suited to the runner is the twisting situp. This is performed with feet flat on the floor, knees bent at about 90 degrees. The upper body curls up toward the thigh, starting from the head and then the torso is twisted so the elbow falls outside the opposite knee, sides alternating with each repetition.

This situp approximates the twisting action the torso receives during running at any pace. For sprints, it can be done with weight behind the neck and on an inclined situp board (10-15 reps for power). For distance and conditioning, it can be done in sets of 20-100 reps with the feet held under a sofa or other heavy object.

—CHARLES PALMER

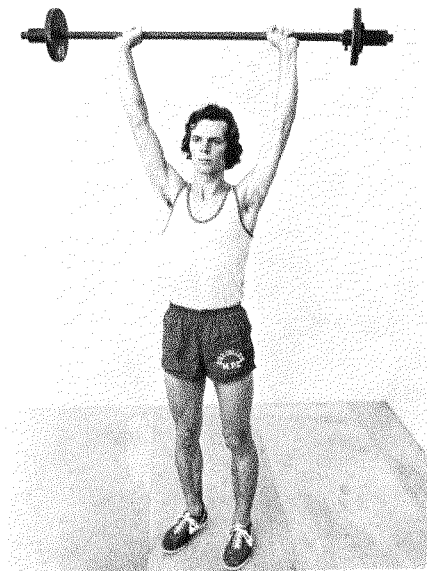
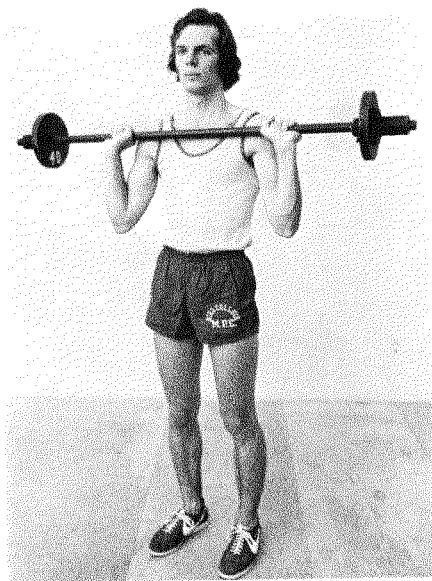
1. STARTING POSITION

Photos by Charles Palmer



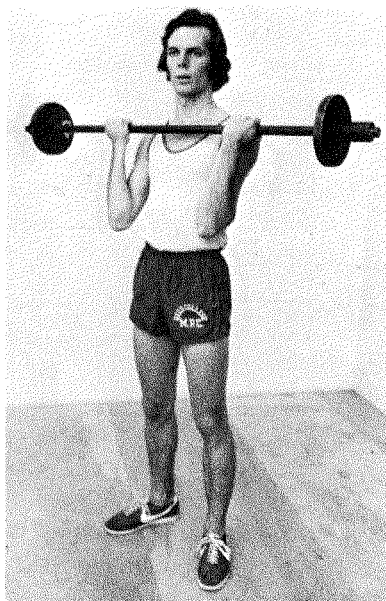
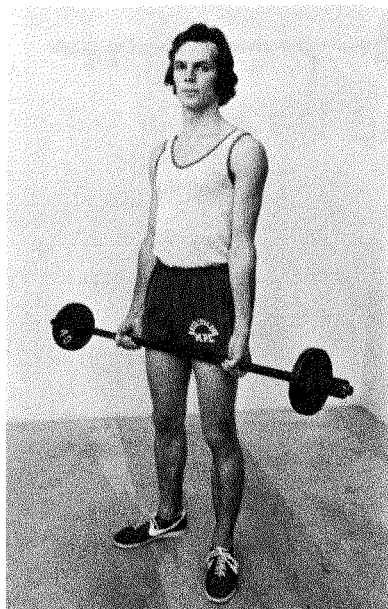
Basic starting position for lifting weights: back straight, weight close to ankles, hips low, arms straight.

2. CLEAN AND PRESS



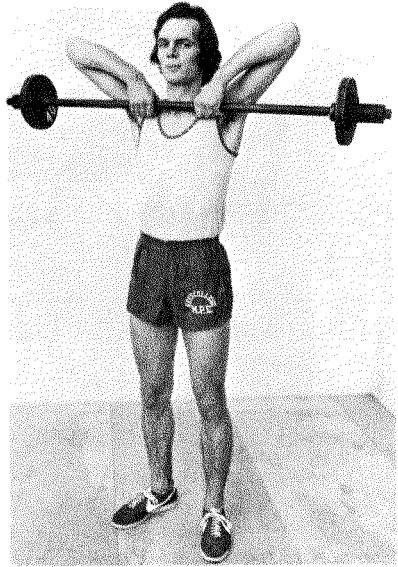
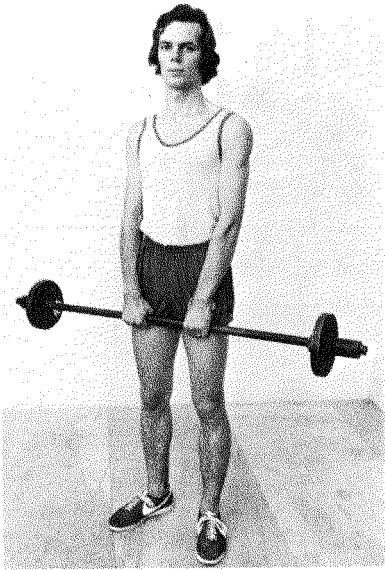
- Involves most muscle groups, principally arms, shoulders and upper back.
- From basic starting position, straighten legs until weight reaches knees. Snap weight to shoulders using back and continued leg straightening (left photo). Push weight overhead with arms (right). Lower to shoulders. (Weight can also be lowered behind the head to shoulders, or dumbbells can be used). (The "clean" alone can be performed as a back exercise and explosive power developer—5-7 reps.)
- 5-7 reps for power; 10 or more for endurance.

3. CURL



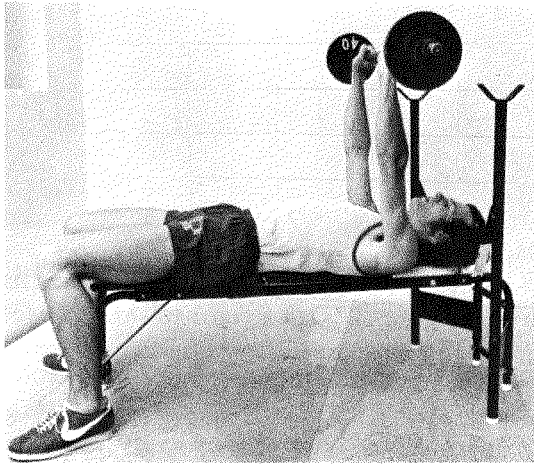
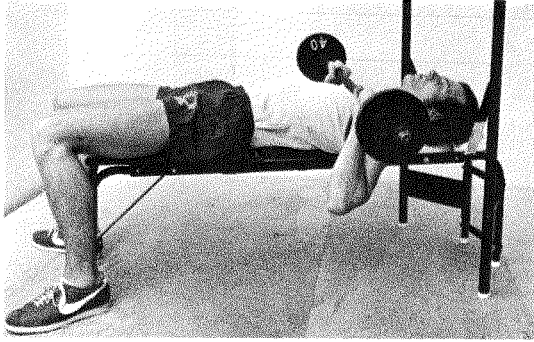
- For biceps and forearms.
- Weight hangs from arms. Hands at shoulder width with palms forward (left photo). Curl weight to shoulders with elbows stationary at sides (right). Be sure arms are completely straight as weight is lowered to repeat lift. (Reverse curl done with palms facing back, or dumbbells can be used.)
- 5-7 reps for power; 10 or more for endurance.

4. UPRIGHT ROW



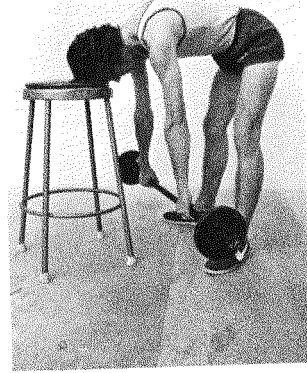
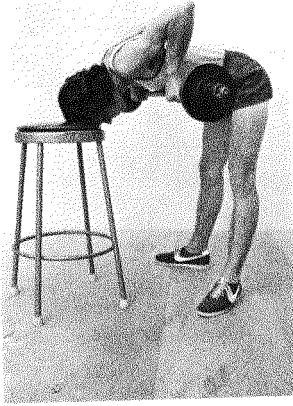
- For biceps, shoulders, upper back.
- Hands 6-8 inches apart, palms facing back, hands hanging in front at start (left photo). Pull weight to shoulder level, using arms only—no body swing (right). (Grip can be varied for different effect.)
- 5-7 reps for power; 10-15 for endurance.

5. BENCH PRESS



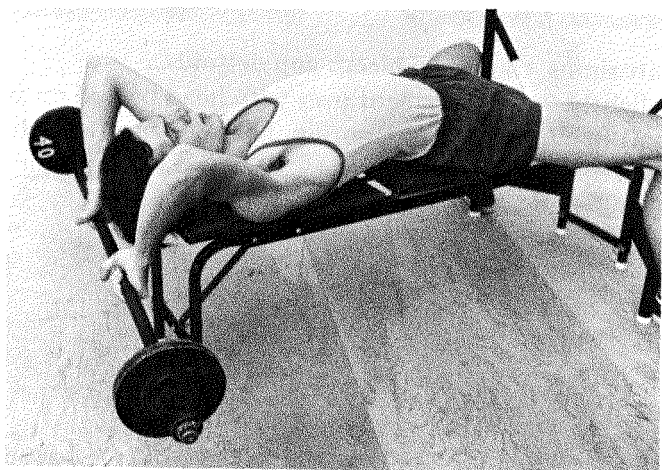
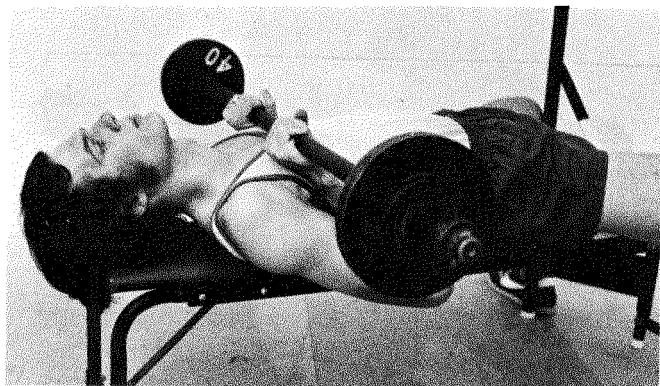
- Shoulder-width grip works triceps and deltoids; wider grip also works pectoral muscles.
- Lie flat on bench with barbell at chest (may need partner to assist with weight) (top photo). Press weight away from chest to complete extension (bottom).
- 5-7 reps for power; 10-15 for endurance.

6. BENT-OVER ROW



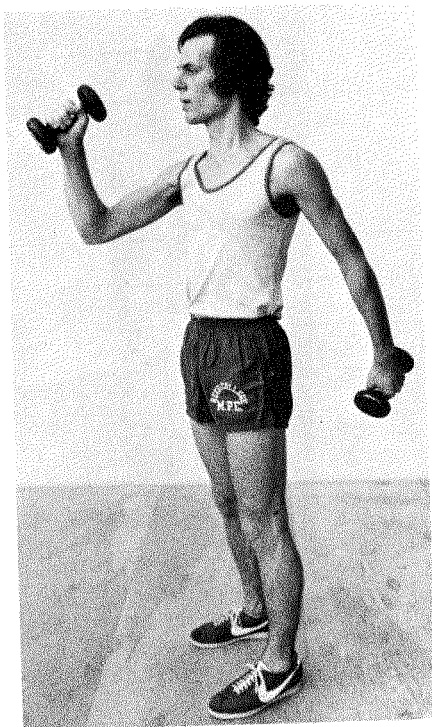
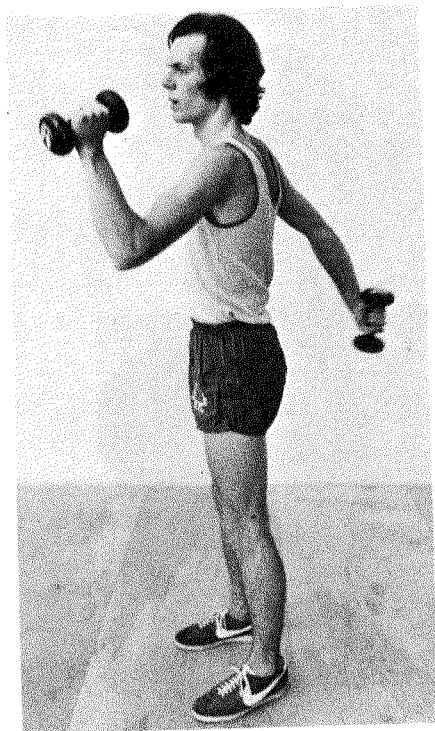
- For latissimus, trapezius, biceps and deltoids.
- Legs slightly bent, body bent over with head braced on stool (optional) to eliminate body motion, back straight (left photo). Bar pulled up to touch middle of chest (right). (Variation: single dumbbell with free hand braced on stool.)
- 7-10 reps for power; 12-20 reps for endurance.

7. BENT-ARM PULLOVER



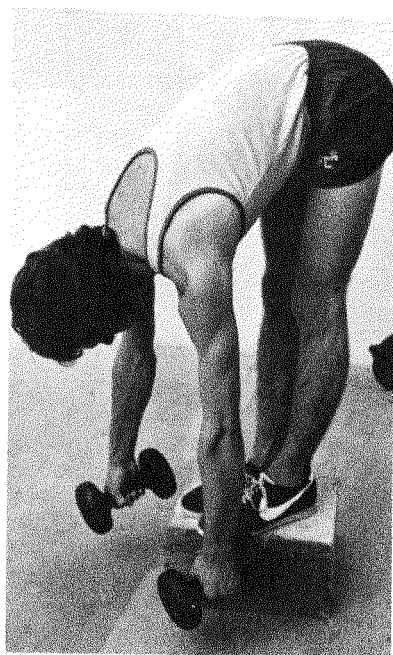
- For pectorals, deltoids, arms.
- Start with narrow grip, weight resting high on chest (top photo). Push weight back and down in an arc just over head. Let weight go below level of bench (bottom). Return to chest. Perform in a smooth, brisk cadence.
- 5-7 reps for power; 10-15 reps for endurance.

8. ARM SWING



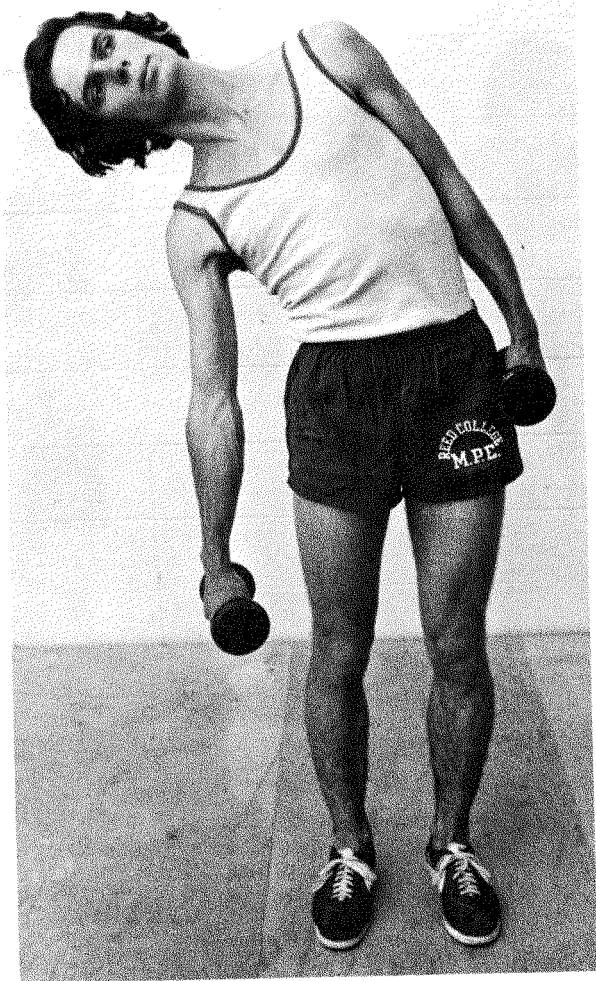
- For arm, shoulder and upper back muscles used in running.
- Hold light dumbbells in thumbs-up position. Alternate swinging of arms in rapid motion. Back arm swings as far back as possible. Front arm bends to 90 degrees and comes up to eye level.
- 7-10 cycles for power; 15-50 for endurance.

9. STIFF-LEGGED DEAD LIFT



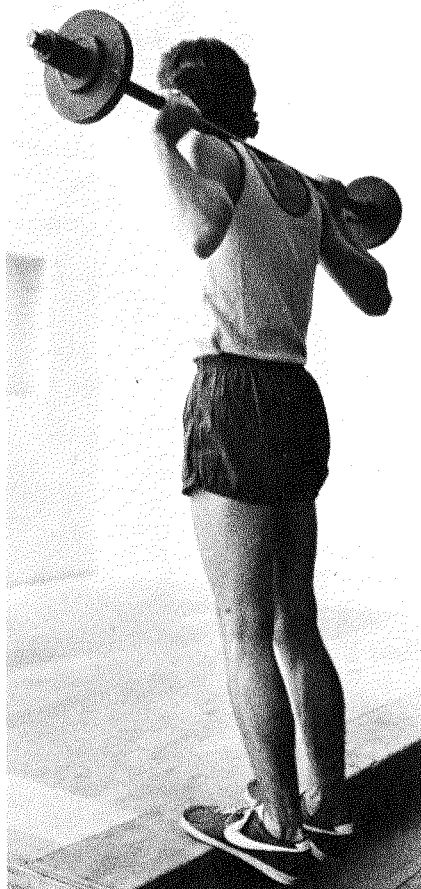
- Entire back and back of leg flexibility.
- Do very carefully and slowly to avoid strain. Keep legs locked throughout. Lower dumbbells (or barbell if flexibility doesn't permit touching toes with weight at first) to toes or below from elevated position on box. Start with light weights and do not attempt to go very low at first. Proceed gradually.
- 10-20 reps for flexibility.

10. SIDE BEND



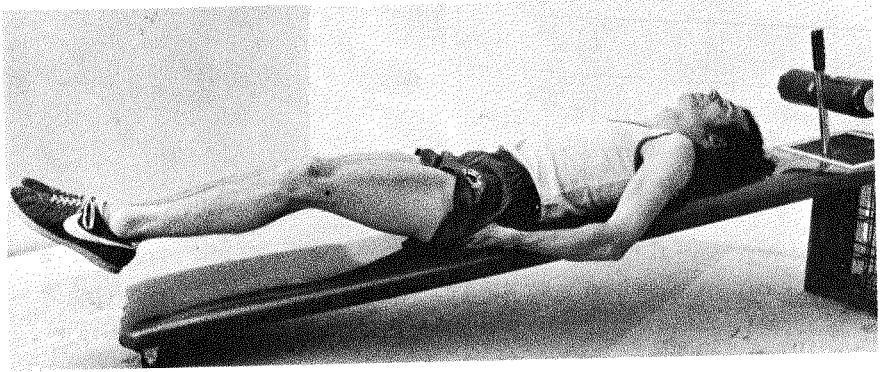
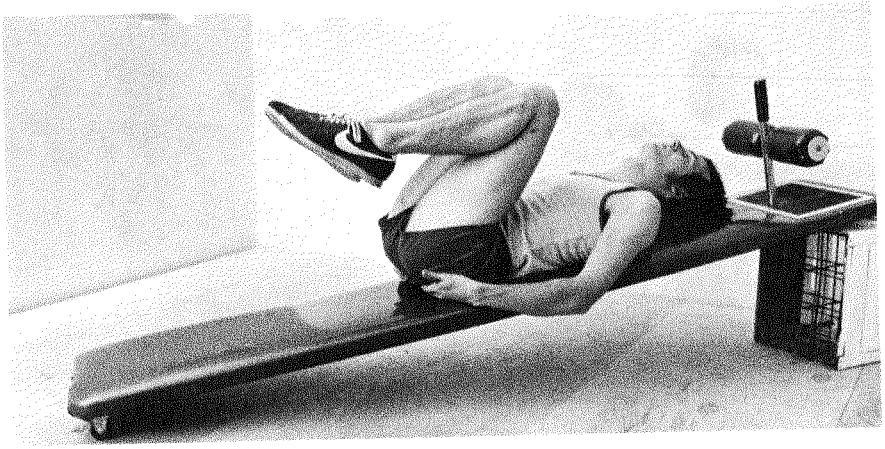
- For lower back and sides.
- Hold dumbbells at sides and bend to each side alternately, as far as possible. Use very light weights to start. Work up to no more than 25-30 pounds. Increase reps after that point. Variation: bend forward or arch backward during movement.
- At least 25 reps each direction.

11. TOE RAISE



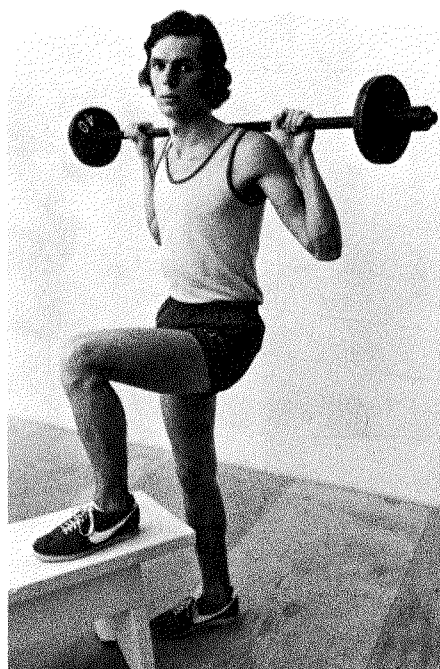
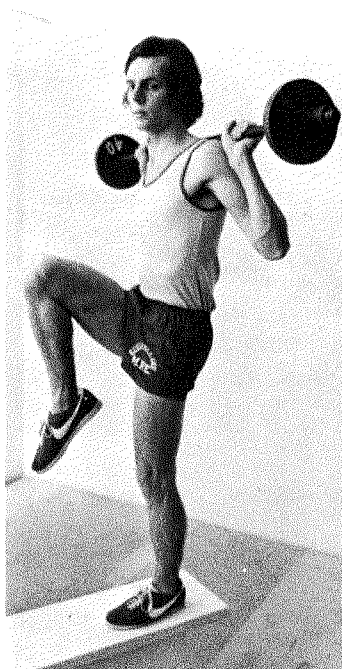
- For calf muscle strength, achilles tendon stretch.
- Use barbell or single dumbbell in one hand if balance is hard to achieve. On elevated surface, rise up on toes as far as possible (left photo). Lower as far as possible (right). Vary by turning feet in or out, or by using alternate single foot.
- 10-15 for power (with heavy weight) or flexibility (with low weight and complete stretch); 20-100 for endurance.

12. LEG KICK



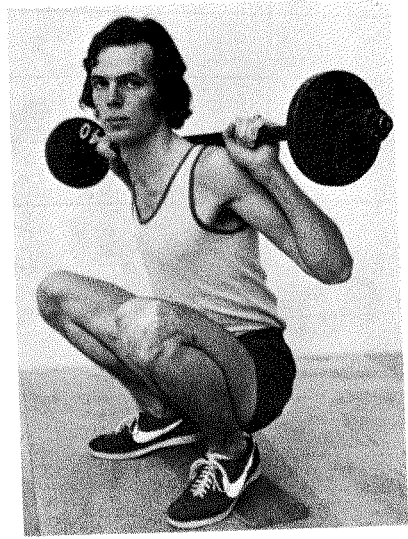
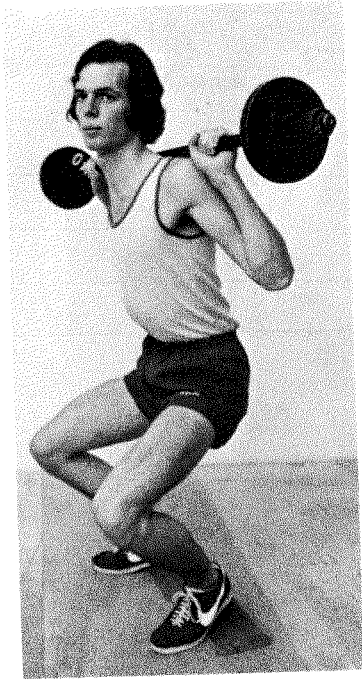
- For lower abdominals and hip flexors.
- Lie flat on situp board (incline shown for increased resistance) with hands under hips. Pull legs to chest (top photo). Extend legs, touching floor only at end of motion (bottom).
- Work up to 25-50 per set. Raise top of board when 50 reps are reached.

13. BENCH STEP



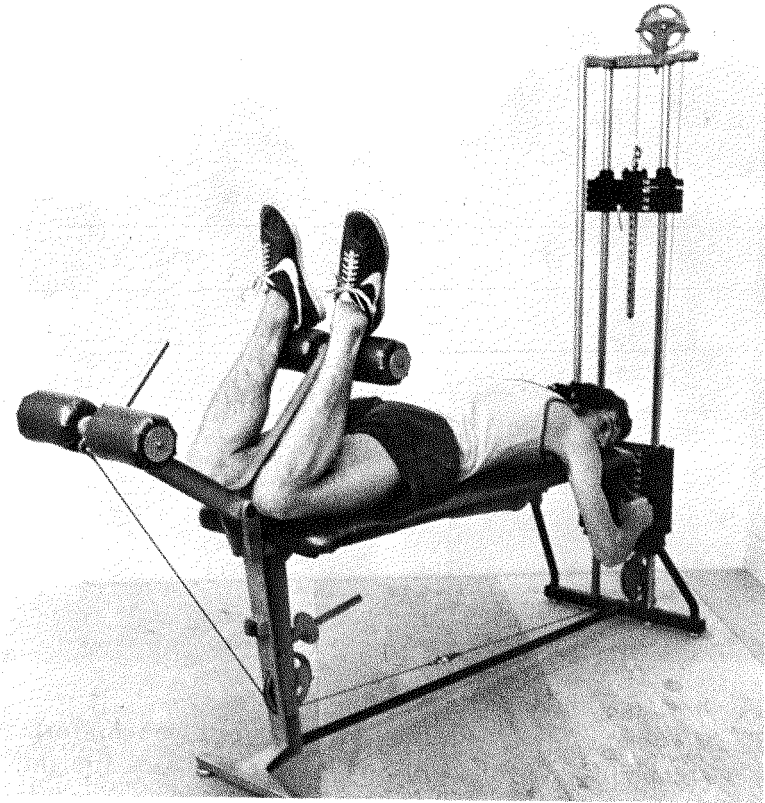
- For hips and thighs.
- Step up on bench or box 14-18 inches high (left photo). One leg straightening completely as body is raised onto bench. Draw up alternate leg to chest as far as flexibility permits (right). Step down on same leg as you stepped up.
- 7-10 reps for power; 15-25 for endurance.

14. SQUAT



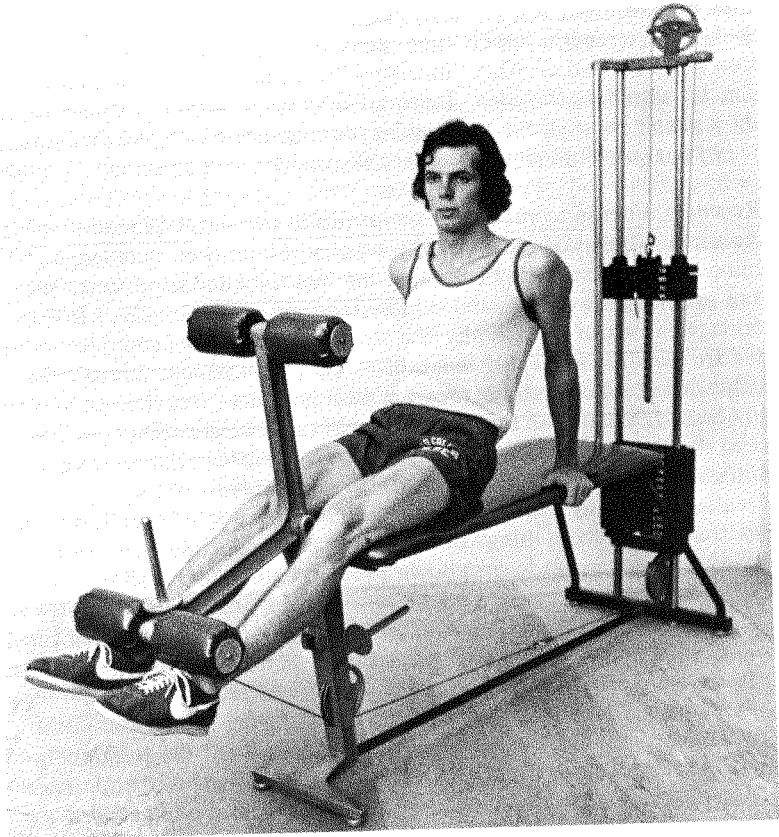
- For hips, thighs, hamstrings.
- Barbell in comfortable position on shoulders, feet comfortably space and pointing slightly outward, head erect, back straight throughout. Drop to partial (left photo) or full (right) squat. Don't bounce into full squat! Return immediately to standing position. Use board under heels if achilles flexibility doesn't permit keeping heels flat throughout movement.
- 5-10 reps of partial squat for power; 15-25 for endurance. Never do less than 15 of full squat; preferably 20-25 for endurance.

15. LEG CURL



- For leg biceps, hamstrings.
- Performed on a leg curl/extension machine or with “iron boots” that strap to shoes. Do repetitions smoothly with swinging motions, and be sure there is full contraction and extension with each movement.
- 7-12 reps for power; 15-30 for endurance

16. LEG EXTENSION



- For quadriceps.
- Performed on a leg curl/extension machine or with “iron boots” that strap to shoes. Do repetitions smoothly with swinging motions, and be sure there is full contraction and extension with each movement.
- 7-12 reps for power; 15-30 for endurance.

50-MINUTE SUPPLEMENT

BY WAYNE ROE

Like milk, running is often considered the "complete physical food," packing stamina, strength, muscle tone, cardiovascular development, mental relaxation and a myriad of other "nutrients" in a single, inexpensive activity.

I'm not disputing this idea. Indeed, I fully agree with it. I only wish to prescribe a simple supplement to a regular running diet which will promote optimal physical development and reduce the incidence of running-related injuries.

Recently, I began to suffer the symptoms of overdevelopment of the legs, a common ailment of runners. Three years of long slow distance, interval training and frequent racing had made my legs tight and produced a succession of injuries to my calves and achilles tendons. Additionally, I frequently experienced a lack of general physical strength in workouts and paces which detracted from my enjoyment and inhibited my performance. I resolved to correct this defect in my training program with minimal extra time and effort. Having become familiar with stretching exercises and weight training in my youth and through two years of karate, I assembled a program requiring but 50 minutes a week. It has more than fulfilled its promise.

I realize that many runners are skeptical of the value of exercises such as weight training and stretching. Such skepticism in part underlies the failure of many to warm up and warm down properly, a major contributor to injuries and poor performances. Perhaps even more importantly, it indicates a lack of knowledge of the potential and limitations of one's body, which I feel is an important dividend of any physical activity. My 50 minutes a week has left me free from injuries and has given me a wealth of self-knowledge.

A law of weight training states: heavy weights, few repetitions build strength; light weights and many repetitions build stamina. My program incorporates the best of both approaches. It produces strength and endurance without the bulky muscles which can inhibit the fluidity of one's stride.

I began my program while I was a student at Michigan State University and had access to a Universal weight machine. Consequently the exercises are tailored to some extent to this equipment. Most colleges and many high schools have such a machine, its advantage being speed in changing the weight settings. Any set of barbells will work just as well, however, and barbells are convenient and private.

The workout I prescribe is extremely short, simple, and so structured that each exercise becomes progressively easier to complete. It begins with a five-minute stretching session.

After one minute of rest, the weight session begins. The exercises are specifically for the upper body. I feel that my legs get enough of a workout in daily running training, but some runners may need additional leg exercises. Four separate exercises comprise the weight workout: the military (overhead) press, the two-armed curl, the bench press and the overhead pull (or rowing exercise if one uses conventional barbells). Anyone not familiar with the form of these exercises will find descriptions earlier in this chapter and in other weight-training books.

At the beginning, you must find a personal "maximizing weight" for each exercise and set an upper limit on the loads which one works with. The maximizing weight is the heaviest weight one can lift in a given exercise for eight repetitions. Take care not to incur undue strain in determining this figure. There should be an effort to lift, but not a tooth-and-nail struggle. Subtract 20 pounds from each of your four maximums, and you arrive at the starting points of each exercise.

As an example, my personal starting points are 100 pounds for the military press, 70 pounds for the curl, 130 pounds for the bench press, and 110 pounds for the overhead pull. Remember: it is better to be lifting too light rather than too heavy at the start. Everyone will progress, but weights—like running—take time to shower benefits.

The program is designed to produce maximal strength and muscular endurance to the distance runner. One will not experience a bulking of the upper body, but at most a slight increase in muscular definition which does not inhibit the fluidity of one's stride.

Each exercise is performed only once during the course of workout for a total of 40 repetitions. Beginning with the starting weight, do 10 repetitions of one exercise and then immediately (no rest) reduce the load 20 pounds and do 10 reps, then another 20-pound reduction and 10 reps, and still one more set with 20 pounds less. Then take a two-minute rest before proceeding to the next exercise.

The format 10 reps times four sets is the same for each exercise; only the starting points differ. The recommended order of the exercises is (1) military press, (2) curl, (3) bench press, (4) pull. Do each set as rapidly as possible. This helps build muscular endurance, a valuable asset at the end of a race or workout when arm motion "carries" you. Make sure to pace yourself so that all repetitions can be completed at each weight level, however.

Properly done, the stretching-weight workout I have outlined requires no more than 20-25 minutes to complete. I do it three times a week, although two sessions are adequate for most runners. A fundamental rule of weight training is to take at least one day of rest between workouts. Monday-Thursday or some other two-day rest schedule seems best.

What results should you expect from the program which I have outlined?

First, one must remember that weight training takes time to produce significant results, two to three months minimum. Consequently, you must follow it as religiously as your running regimen to get the full benefits. A missed workout here and there will not hurt, but too many days off will result in a loss of physical and mental stamina.

I have easily incorporated this program in my daily workouts without any adverse effects. I might add that I feel best when the weight work is done before running. For a few minutes I experience a tight, fatigued feeling as I begin running but this abates in a mile or so. I have run many of my best interval and distance workouts after lifting weights.

After three months, the runner following my program should have experienced a number of physical and psychological benefits. His strength will be far greater and much more "balanced" than before. It has been said that "speed is strength," and there should be definite gains in this department. Perhaps because of my ability to maintain faster and more relaxed arm swings, my short distance times have significantly improved from weight work. The

addition of upper body strength helps "carry" me through workouts and races when the legs start to break down. Purely the addition of this workout to my training diet brought my marathon time down from 3:15 to 2:55, and made the "last six" much easier to run.

The combination of weights and stretching has also produced a remarkable freedom from injury in my own case. Since beginning this program, my log shows no days off due to injury, while before this time I could count on four days off per month as a minimum.

Finally, there are untold psychological benefits which should come from this program. Weight training reduces flab and promotes muscle tone and definition. One looks and feels better and naturally is more confident. It is almost impossible not to run better under these conditions.

I realize that most runners feel that a pure running diet is sufficient for the conditioning needs of their bodies. Most would prefer to spend the 50 minutes my program takes on the road or the track. I believe, however, that the additional 6-8 miles per week one would gain are far outweighed by the benefits of my program, especially in the defense against injury which it promotes. Personal experience bears me out on this point.

I encourage all of my running compatriots to experiment with this program for three months or so, perhaps beginning in the winter when the extra miles will not be missed as much. Even the "complete food" will have been supplemented.

WEIGHTS FOR WOMEN

BY BOB HYTEN

Bob Hyten coaches the Ozark Track Club, one of the strongest Midwestern girls' and womens' teams.

The Ozark Track Club of greater St. Louis is one of the few women's teams which has weight lifting in its regular training schedule. While I make no claims that this is an ultimate program or even that it is 100% correct, it is the result of three years of refinement and has given us positive results.

The purpose of the program is to develop all-around strength and endurance. There is no attempt to build muscle bulk. The emphasis is on the kind of strength that results in quickness and spring while carrying the body in a relaxed manner. It is designed to eliminate tired arms in distance runners and weak backs in high jumpers, plus developing strong ankles and calves for long jumpers and overall leg strength for hurdlers—all the while keeping the figures in mind. One basis for settling on the program is that it is of value to all members of the team. I should note that all members learn every event, and most of them regularly compete in the pentathlon.

I limit weight lifting to those girls whose growth has leveled off. Muscles being stretch by rapid growth do not need the further strain of being tightened by lifting. I do let the younger girls do some of the arm work during our group practices because almost all girls are too weak to carry their arms through a race.

The majority of our lifting is confined to our development seasons—August through March or cross-country and indoor seasons. Good cross-country runners do little or no lifting in the main part of their season, but since we attach little importance to the short indoor season all do their major lifting at that time. Lifting is done three days a week (every other day) from Dec. 1 to April 1, then is gradually phased out during April. Full-scale running workouts aimed at development of strength and endurance are done on the alternate days.

Intense running, warm-up and stretching sessions precede weight lifting. We do 12 different lifts or exercises in about the same order each time. The variance from the order comes when we do sets of arm exercises between sets of leg exercises in order to fully utilize our equipment as well as keep the sessions from dragging out too long.

Half-Squats: Three sets of 10 each, beginning with 40 pounds (some can start higher) and adding 10 every fourth session up to a limit of 1½ times body weight. Don't squat down too far for basic leg strength.

3-in-1: One set of 10 of each exercises, done consecutively. Three exercises are (1) two-arm curl (grip weight with arms at shoulder width and palms out, raising weight from relaxed arms down to position under chin; making sure not to brace arms on body; (2) upright rowing (grip weight with hands together, palms in, and lift weight to under chin keeping elbows high); (3) two-hand press (grip weight at shoulder width lifting it from beneath chin to full overhead extension). Begin with 10 pounds on long bar and increase five

every fourth time to maximum of 40-50 pounds. Primary arm strength exercises for all runners.

Leg Extensions: Three sets of 10, beginning with 20 pounds and raising by five every seventh time. 40-50 pounds maximum. Hold legs extended for 15 seconds on last one of each set. Thigh strength.

Wrist curls: Raise and lower five pounds five times. No increase; just try to get to point of doing all five in a row. Tie one end of rope through 5-pound weight and other through 12-inch piece of broom handle. Hold arms out fully extended and raise and lower only by twisting wrists. A must for weight girls.

Sit-Ups: One set of 30 with bent leg, using stomach muscles only. As soon as 30 can be accomplished easily, add 2½ pounds behind head, then five and finally 10. Flattens tummy and strengthens diaphragm for breathing.



Bil Canfield

Back Curls: One set of 30. Lie on stomach and raise trunk with feet supported. No weight. Strengthens back.

Split Squats: One set of 10 with weight being half of half-squat weight. Jump into air off of one foot at a time with the other foot being for balance only. Count 20 jumps, 10 on each foot, for each set. A must for all jumpers and hurdlers.

Bench Press: Three sets of 10 beginning with 20 pounds and raising five each fourth session. Maximum for runners about 40-50 pounds. Develops

chest strength overlooked in "3-in-1" exercises.

Toe Raises or Heel Raises: Three sets of 10 with half-squat weight. Standing on two-by-four board with ball of foot and toes, raise up on toes as high as possible. First set with heels in normal position. Second with toes together and heels out and third with heels together and toes out. Good for calf strength.

Dead Lift: One set of 10 with split-squat weight. Be very careful to use both legs and back or you can get hurt. A must for high jumpers.

Groin: This is a "buddy" exercise which you do with the help of a partner. Lying on your back with your legs straight out and together, spread your legs while your buddy holds your ankles, offering resistance. She also offers resistance as you return your legs. One set of 10.

Hamstring: With your buddy sitting on your seat as you lie face down, raise your feet together toward your buttocks, bending at the knees while your buddy offers resistance by holding against your ankles. One set of 10.

This program was designed only to get maximum efficiency from present muscle bulk and is not intended to produce female Mr. Americas. I don't doubt for a second that a girl could do twice the prescribed work. Right now I tend to not want to tamper with their feminine appearance, and while I'm not positive more weight would do this, I do not know from experience what the results would be. I do know what it has done for the strength and endurance of our athletes. Those results are all good.

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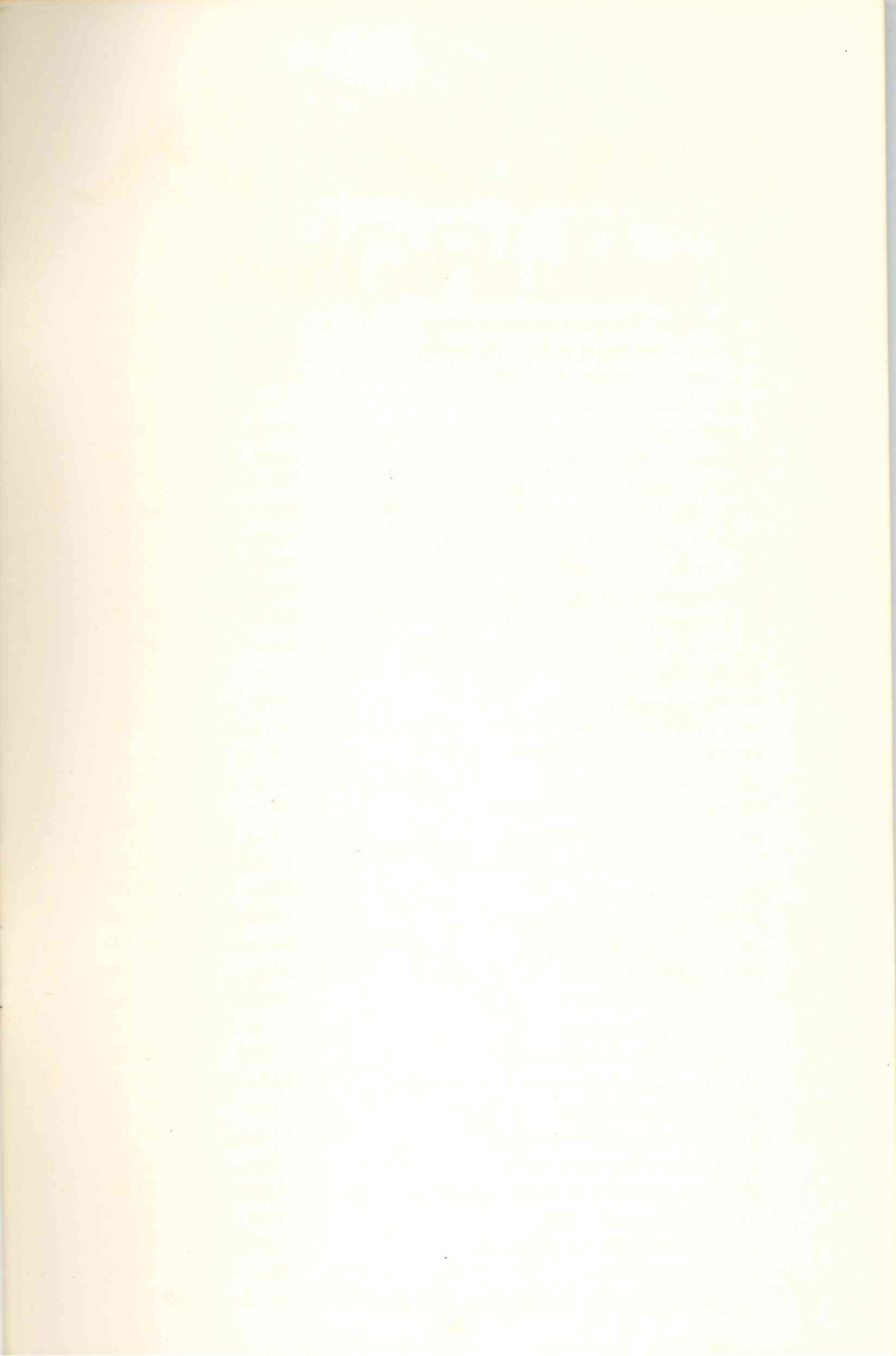
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FRONT COVER:
Sprinters, such as these in the 1972 Olympic Trials, require highest levels of strength and suppleness. Pictured are (l-r) Rey Robinson, Warren Edmonson, Steve Riddick and Harrington Jackson. (Stan Pantovic photo)

PHOTO LEFT:
Older runners like Lou Fields particularly need supplemental exercises to retain strength and flexibility, which normally decline with age. (George Beinhorn)