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Problems in the Trainer's
Program

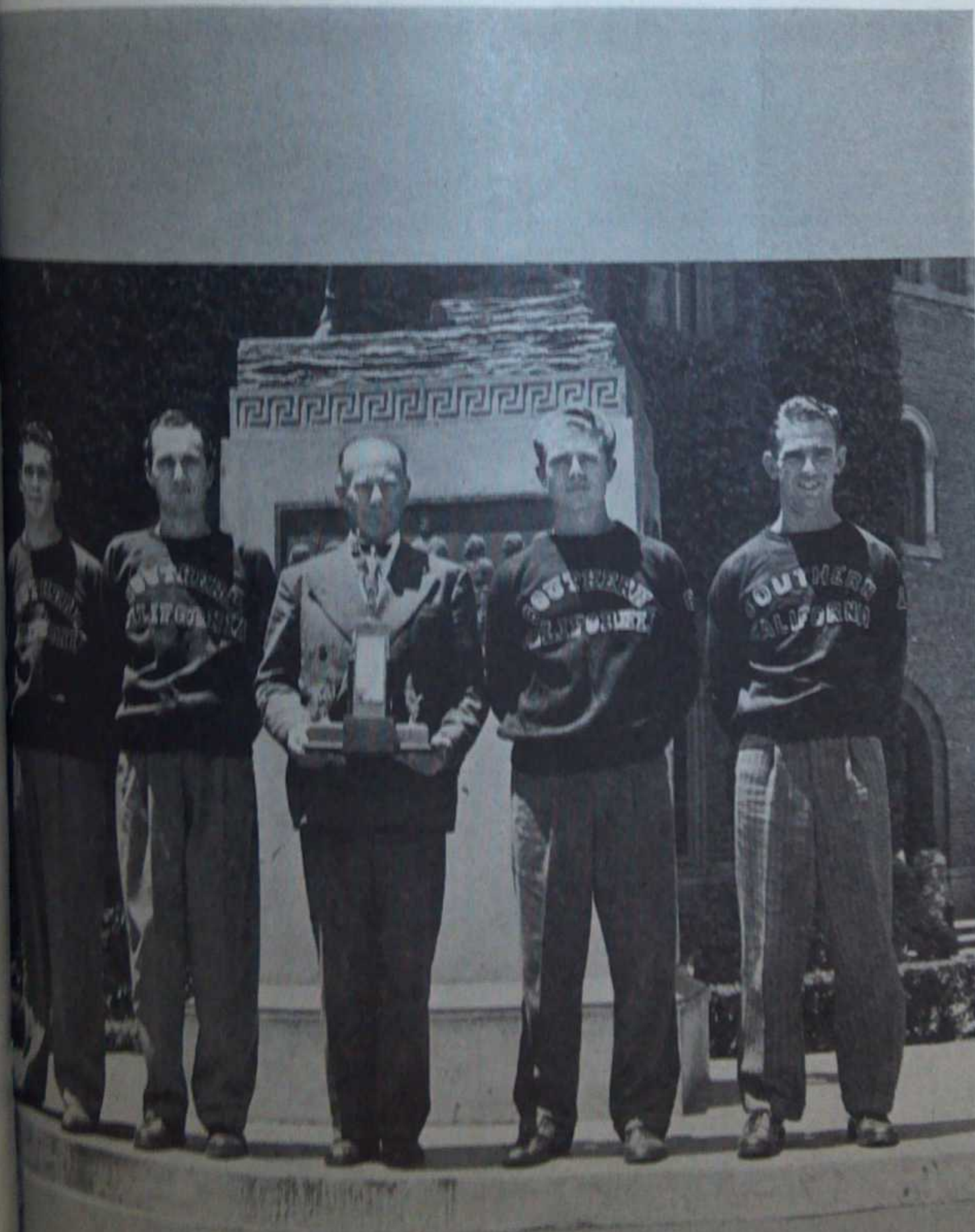
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Left to right: Edsel Curry, broad jump;
Captain Cliff Bourland, 440 and 220;
Coach Dean Cromwell holding the 1943
N.C.A.A. team title trophy; Doug
Miller, javelin throw and Jack Trout
100 and 220.

The Advisory Board at Work

By Wilbur Bohm

OUR advisory board is already showing results. One of the members recently sent us seven subscriptions to our Journal and memberships in the National Athletic Trainers Association. Others are preparing articles for future issues. One of the suggestions that we made in last month's issue was that we would welcome advice and help from the Advisory Board and all members of our Association. May we extend our invitation to include the many thousand readers of this publication. We are in a position now to answer specific questions dealing with training problems. These will be referred to authorities. All inquiries should be addressed to the editor of this section.

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Problems in the Trainer's Program

By W. W. Tuttle, Ph.D.

Department of Physiology, University of Iowa

THE problems which confront the trainer are many and varied, but in general, the object of the whole procedure is to develop efficient individuals, and then to protect them from injury, either of an acute or chronic nature.

For the most part the treatment of acute injuries is quite well understood. However, some of the more obscure phases of the problems of acquiring and maintaining good physical condition are yet unsolved. It is these more obscure points of procedures in training men that are being given special attention at the present time. Because of the demands made on men due to war, scientists all over the country are studying many aspects of the problems which confront physical trainers. Some of the findings are beginning to settle numerous questions which have confronted the trainer and thus seems worthy of brief review.

Recently Keys¹ reported the results of a long series of controlled experiments relative to the supercharging of the diet of soldiers with accessory food products in order to increase their capacity to do work. Since the supercharging of the athlete's diet with various accessory substances, especially vitamins has been practiced, the results of Keys' experiments should prove beneficial to the trainer.

The effectiveness of vitamins in curing deficiency diseases has been so spectacular

¹ Keys, Ancel. *Physical Performance in Relation to Diet*, Federation Proc. Am. Soc. Exper. Biol. 2: (Sept. 1943) 164-187.

LAST year as a special request Dr. Tuttle of the University of Iowa prepared an article on the Anatomy of the Shoulder. His assistance was so much appreciated by the trainers that a second request was made to Dr. Tuttle for a series of articles this year, the first of which appears in this issue.

that we have been led to believe that the promiscuous use of them brings about benefits to normal, healthy people. Unfortunately, this idea has been supported in some instances, by poorly controlled experiments. Also some reports which appear as the result of adequate experimentation seem to support the view.

As the data become more complete, it is becoming more and more evident that vitamins fall into the same category as drugs and that they are useful chiefly in treating deficiency diseases. Also, it seems that when the deficiency has been met, their further use is of little or no benefit.

One vitamin that is used to supercharge the diet of the athlete in the hope that his efficiency will be improved is vitamin A. Since the available evidence shows that this vitamin has no direct and immediate effect on muscular function, supercharging the diet with it is of no avail.

Vitamin B is also used as a supercharger of the athlete's diet. The available data show that large daily doses of this vitamin increased neither work performance nor work capacity and therefore, there is no

reason for including extra vitamin B in the diet of the athlete.

Likewise, supercharging the diet with vitamin E is of no use since it has not been shown that it plays any direct part in the neuromuscular function of the normal individual.

Athletes, especially swimmers, who are incapacitated frequently by the common cold and infected sinuses have been given codliver oil as a preventive measure. There are no data to justify this procedure and certainly vitamin D is of no use in such instances. Supercharging the athlete with fish oil or fish oil concentrate is, therefore, only an idle gesture.

Another accessory to the diet for which great claims have been made is glycine, in the form of gelatin which contains 25 per cent glycine. The remarkable increase in work capacity claimed as a result of gelatin feeding, stimulated careful and elaborate experimentation. As the evidence now stands, loading the diet with gelatin, is of no benefit as a means of increasing work capacity.

In general we may conclude that the practice of supercharging the diet of athletes with vitamins and other accessory food substances is showing less and less promise as a means of increasing efficiency, and the capacity for doing work. On the basis of data gathered by the more elaborate and well controlled experiments, no beneficial results are obtained by feeding excess vitamins to normal people. Obviously, where deficiencies are present

proper treatment is considered necessary. Perhaps it is in order to say something about the drinking of water by anyone engaged in strenuous exercise. There is a tendency on the part of some trainers to discourage and even forbid the drinking of water sometime before a bout of strenuous exercise. In some cases, the juices of citrus fruit, with a small amount of sugar are substituted for water. As a matter of fact, it is important that anyone who is participating in strenuous activity should be provided with an abundance of water, so that all of the water storage places in the body are well filled. This permits more profuse sweating, and thus, a better regulation of heat loss. It also helps to avoid a drying of tissues exposed to the passage of air. In fact, there is no reason to believe that an athlete can not safely

drink an abundant supply of water shortly before a strenuous bout of exercise. The only point to take into account is that sufficient time should be allowed so that any excess can be voided before a contest begins. The substitution of fruit juices with sugar is no advantage, except that the sugar serves as a source of energy.

The addition of excess salt to either the food or drinking water is regarded as unimportant in the case of athletes under ordinary circumstances. If the water loss is to be so great that there is accompanying it a sufficient loss of sodium chloride so as to cause a depletion of the chloride, then it should be replaced. Ordinarily, this does not occur in the average bout of strenuous exercise.

In the matter of supercharging the diet of athletes, or anyone else, with accessory

food substances, it is a comfort to know that nature is good to us. Even though, for the most part, excesses are of no use, yet they do no harm, since our bodies excrete them, and thus maintain the normal balances.

At present, the trainer may continue loading diets, still being unwilling to give up the traditions, some of which are based on only partial truth. If he does so, he should do it with the full facts well in hand, and not blindly, or in spite of what science is tending to show to be the facts. To be informed so as to know how to proceed, and what to expect as a result, the trainer has the privilege as well as the duty to keep himself informed, by reading a constant stream of scientific literature being published in the leading journals by scientists from well-equipped laboratories.

Methods of Relieving Cramps in Swimming

By Edward J. Shea

Department of Physical Education, Emory University

A GENERAL treatment of the subject of cramps, occurred while swimming, deserves a place of consideration in courses of warfare swimming.

Although cramps, which occur in any part of the body, other than in the abdomen, may be little more than inconvenient to the swimmer who may be swimming for his life, there nevertheless remains a question in the minds of most swimmers as to what constitutes a cramp, the frequency of occurrence, the parts of the body most affected, the conditions under which they are most apt to occur, and the methods applied that are most effective in relieving them.

The present knowledge of the physiology of muscular contraction is not, as yet, complete, although several theories have been advanced. Within certain bounds, we are able to follow the physical and chemical changes which probably take place in the isolated skeletal muscle during contraction and relaxation. The changes taking place in the intact muscle during exercise are of a more obscure and controversial nature. We know that a muscle contracts, when it is stimulated mechanically, electrically, chemically or by irradiation.¹ Muscle spasms due to fatigue and the obstruction of circulation to the part due to exposure to cold are thought generally to be important factors in the production of cramps.^{2, 3}

The Part of the Body Most Frequently Affected

Throughout a period of forty-six weeks

of swimming at Emory University, observation on approximately one thousand men has led to a classification of cramps on the basis of parts of the body affected most frequently in the following order: muscles supporting the tarsal arch of the foot, particularly the flexor digitorum longus and the flexor hallucis longus; calf of the leg, gastrocnemius and soleus; the front of the thigh, quadriceps femoris; and lastly, the back of the thighs, hamstrings. A negligible number of cases of muscle "soreness" was reported in the neck and upper back. These were not true muscle cramps in the real sense, but were due perhaps from work of an overstretching nature or from the use of certain muscle groups in a manner unused previously. Abdominal cramps were never encountered, although many swimmers did participate in the activity immediately after a meal. Statistics advanced by the National Safety Council on the number of drownings, due to this latter type of muscle-cramp, proved that their occurrence is very infrequent.

The above order of the parts of the body most frequently affected by cramps while swimming might well be accepted as those most likely to occur generally.

The Frequency of Occurrence

We can only surmise how frequently a cramp will occur since, as yet, we have not completely isolated the true cause of this type of contracture. It is quite certain, however, that cramps have a distinct tendency to recur a short period after

the first severe contraction, unless thorough subsequent treatment is administered. It is of interest to note that cramps do occur more frequently among athletic men who ordinarily swim very little.

Conditions Under Which They Are Most Apt to Occur

Probably the greatest pre-disposing factor contributing toward the development of cramps while swimming is extremely cold water. It is not uncommon for muscle contractures to occur quite readily, even among well-conditioned swimmers in water ranging from 60°—35°. This, no doubt, is due to the reduction of the circulation in the periphery of the body which, in turn, decreases the efficiency of the muscles and contributes directly toward the occurrence of cramps.

Distances of an extended duration demanding the greatest capacity of the swimmer or the repeated movements of inefficient swimmers are most apt to result in various degrees of muscle cramp.

Methods Most Effective in Relieving Cramps

It is believed that, in situations where men must swim no great distance to rescue or to some means of support in order to save their lives, they can do so, regardless of the extent of cramps which have occurred in their lower limbs. Cramps which occur in the feet are of little consequence and deserve little mention. Cramps,

however, which occur in both feet, both calves, and in both thighs simultaneously cannot deter a man from reaching an objective, even though he loses the use of both these limbs. It is believed that, in such situations where the water is not of an extremely cold degree, cramps will, over a period of time, relieve themselves.

It is well to keep in mind two basic principles for the relieving of muscle cramps. A muscle has two points of attachments; one, its point of origin located on one or more bones; the other, its point of insertion located on an adjoining bone or bones. Thus, movement is brought about by a force acting on a lever; the bones acting as the lever arms, and the muscle acting as the force which produces movement. The contraction of a muscle, as in the occurrence of cramps, decreases the angle between the bones, the contraction taking place from the point of insertion of the muscle back toward its point of origin.

The two principles for relieving muscle cramps are: first, lengthen the muscle; and second, restore the circulation. To lengthen the muscle, it is necessary merely to increase the angle between the two bones on which the muscle has its attachments. This, in itself, is not an easy process, since a muscle is of tremendous strength in such types of contractures. To restore circulation after the muscle has been lengthened, apply movements of vigorous massage.

A simple example of the application of

these principles may be applied to the biceps muscle in the arm. It has two points of origin, on the coracoid process and on the scapula above the glenoid fossa. Its point of insertion is on the tubercle on the proximal end of the radius in the forearm. On contraction, this muscle places the forearm in position of flexion on the upper arm. To lengthen the muscle to its original position, it is necessary merely to push the forearm back to its original position of extension.

A more practical example of a muscle cramp occurring while swimming would be that in the calf of the leg. Experience with a number of cases has proven that massage alone, to reduce this contracture while in the water, is insufficient. The calf muscles, the gastrocnemius and soleus muscles have their point of origins, respectively, on the medial and lateral condyles of the femur and on the proximal third of the fibula and middle third of the tibia, generally speaking, in the posterior section of the lower thigh. Their point of insertion is on the heel or calcaneus bone. A violent contraction of these muscles will readily extend the foot. Thus, a dorsal flexion of the foot toward the leg, keeping the entire leg extended will lengthen these muscles sufficiently to release the cramp. The best method of relieving such a cramp in the water is as follows: First, secure a deep breath and assume a tuck-float position. Second, using the hand on the same side as the affected leg (right hand to right leg), reach down and place

the hand on the inside, and across the bottom, of the forward part of the foot, with the fingers grasping the outer edge of the foot. Keep the knee to the outside of the arm and hold securely. Third, extend the leg a number of times forcefully. This action will tend to lengthen the muscle. Follow with vigorous massage.

Similarly, cramps which occur in the back of the thigh (hamstrings) tend to flex the leg. To lengthen the muscles involved in this action, it is necessary to forcefully extend the leg forward. This can best be done in the water by assuming a pike-float position; grasp the affected leg at the ankle with the hand of the same side, keeping the ulnar surface of the arm lying along the tibial surface of the leg. Attempt to extend the leg forcefully, by applying pressure downward with the elbow and pulling upward with the hand.

Cramps which occur in the front of the thighs (quadriceps femoris) tend to extend the leg. To lengthen the muscles involved in this action, it is necessary to decrease the angle formed by the thigh and the leg. To do so effectively, grasp the affected leg at the instep of the foot, and flex the leg backward toward the thigh. Attempt to extend the entire body forcefully backward during this action.

The lengthening process should in all cases be followed by movements of vigorous massage. Should the cramp recur, the entire process must be repeated.

1. Krusen, F. H. *Physical Medicine*. 2. Dawson, P. M. *Physiology of Physical Education*. 3. Schneider, E. C. *Physiology of Muscular Activity*.

Suggested Exercises for Football Training

By Archie Hahn

Athletic Trainer and Track Coach, University of Virginia

IT may be suggested that football candidates start doing some sort of work three or four weeks prior to the start of practice. The men should be started out with long walks, *walking not sauntering*, cross country, if possible. After about a week of this, they should start running, walking when tired, then running again, keeping this up until they get a good work-out. They ought to cover at least two miles. After a week of this, they should be able to run a mile or so at a reasonable pace. It is also advisable to have them take some short sprints after their distance work.

The man returning for football practice, if not in good physical condition, holds back the men who are in good shape. His own chances for making the first string are not very good. A football season is too short for a man to report physically unfit.

GREET a champion in Archie Hahn!
For many years holder of records in the 200 meters and 220 yards, winner in the 1904 Olympics of the 60, 100 and 200 meters and the 1906 Olympic winner of the 100 meters. Before going to the University of Virginia as track coach and athletic trainer, fourteen years ago, Hahn served as coach at Pacific University, Monmouth College, Whitman College, Brown, Michigan and Princeton.

Here are a few exercises that may be used by players in their rooms, night and morning. Push-ups straight-legs extended and knees locked. The back should be kept straight and the arms should be straightened at the end of the push-up; the players should go all the way down and touch their chests to the floor.

Deep knee bending—Have the men start erect, up on toes, down to deep knee-bend and erect again. Do not let them go too easy on this, as this is a fine exercise for knee and ankle joints. Another good exercise for ankles is the following: With body erect, legs straight, feet flat on the floor, bend ankles outward as far as possible, inward the same. From the same position, start high on the toes then heels flat on the floor, raise toes upward, high.

A knee exercise that may be of some benefit is as follows: With legs straight, weight transferred to one leg, the other resting lightly on the floor, players should twist the hips right and left, until they feel a pull in the knee joint, then the weight should be transferred to the other leg and the exercise repeated. A twist of the hips does the work, so see to it that the players are well around on the turn.

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They should go easy at first, then lengthen the time of exercise.

My experience has been that a football player should keep in good physical condition the entire year, play some game or sport that requires agility and the development of stamina. No man can make a real football player out of himself, if he does not keep in fairly good shape all the time. Spring football has helped materially. All football men should spend considerable time in learning how to run. The game now is for the fast man, not for the slow. With a little work during the off-season, any man can increase his speed.

I believe that kickers will find it beneficial if, during the winter months, they do some practicing in high kicking and also hitch-kicking for height. The hitch-kick is done as follows: The right-footed kicker kicks up his left foot and before this reaches the floor on the return, he makes a kick for height with his right. It is a good idea to have your kickers do the same thing with the other leg.

The following grass drill at the start of practice each day, I believe will be found useful in the early season. Later it is also good, but not so necessary as the men become used to hard knocks.

Line the men up in files, five yards apart with five to ten yards between the men. From the position of attention have them do forward-backward-right and left falls and back to position of attention at the command-Up. While on the ground, have them change to positions of forward-right-left and then up. If they are on their faces when the change of position on the ground is made, they should be on their backs in the next position. When they

make the falls they should *fall*, not ease themselves to the grass. Give breathing exercises after each kind of exercise as follows: Arms sideward and up, inhale, high on toes, exhale; arms forward and down, back on heels.

Front leaning rest position, on hands and toes, back straight, dips pushing up and down. Easy first then increase the count. Later try this with the tripod position of the fingers on the ground not the entire hand. This is harder but is a fine way of making strong fingers.

Take a running position, have the men drop hips to relax, almost as if they were preparing to sit on a chair. The shoulder should be the least bit rounded, as in this manner the center of the body weight is put right over the feet. With feet well apart (football run is wider than that used on track), toes straight ahead, then teach the arm swing, bent at elbows to about a 45-degree angle, the swing made so that the hands come forward about to the median line of the body, the chin high in front and on the back swing, the hand comes to the rear of the hip. Swing of arms passes close to the hips. Then teach the players to raise their knees high and put their hands on their hips. Then, when they get the idea as to the action of the arms and legs, have them do stationary running, starting out slowly and increasing gradually until very fast, then gradually slowing down.

Duck Waddle

From a full stoop position, with buttocks almost resting on the heels, heads up, chests out, hands on hips, have the

men walk, reaching out alternately with their feet forward and to the side, knees straight at the end of each stride. This means they transfer the weight of the body from one leg to the other on each stride. This is a great hip developer. As this exercise is hard, if done correctly the men should start easy.

Fundamentals for Football

This drill starts from the same position as the grass drill. The men in the front of the files about-face and run through the line-head at middle of man behind-men in the line jump right or left, their feet well apart and away from the runner and immediately back to the original position. As soon as one man goes through number two, he turns and follows through behind, and, hence, there will be several men following one another running through, which will keep the men in line busy getting away and back. As soon as they are through the line, they turn and face the front again, the same distance behind the last man as in the original line. This is done until every man has gone through the line. As soon as the last man is through, they reverse and run back again to their original positions in the line.

From the same starting position, the men use their arms to chuck or push away an imaginary opponent. With dropped hips, arms and hands forward, they hop right and left, chucking an imaginary opponent away. They chuck forward, then drop back on the left leg, and chuck the man to the left, then front, then right, side stepping back with the right to get out of the way.

QUALIFICATIONS FOR MEMBERSHIP IN THE NATIONAL ATHLETIC TRAINERS ASSOCIATION

SENIOR MEMBERSHIP: 1. Men who have been actively engaged in athletic training or closely allied work for a period of two or more years. 2. Men who are qualified to take charge of the work, in co-operation with the medical department and to direct it in athletic training in a college or university. 3. Men who have had four years of practical experience in a recognized athletic training department of a college or university or some other institution of recognized standard. Senior members have voting privileges.

JUNIOR MEMBERSHIP: 1. Men who do not qualify as Senior members but who are actively engaged in athletic training either as an assistant in a college or university. 2. Men in charge of the training program in a high school, or in closely allied work. 3. Men who are taking an approved training course.

Any Junior member may become a Senior member upon completing the requirements for Senior membership and passing an admission test given

by the Membership Committee. Junior members do not have voting privileges.

Senior and Junior applicants must submit along with the application blank a letter of endorsement from the physician who acts as medical supervisor in their institutions.

ASSOCIATE MEMBERSHIP: 1. Men who have not been actively engaged in athletic training for a period of eighteen months previous to their application. 2. Junior or Senior members who have not been actively engaged for a period of eighteen months, but who are interested in the advancement and recognition of athletic training. 3. High school coaches and student high school trainers.

Associate members do not have voting privileges.

Senior and Junior membership dues are one dollar per year. Dues for Associate members fifty cents. Applications for membership should be addressed to Bill Frey, Secretary and Treasurer, Iowa City, Iowa.