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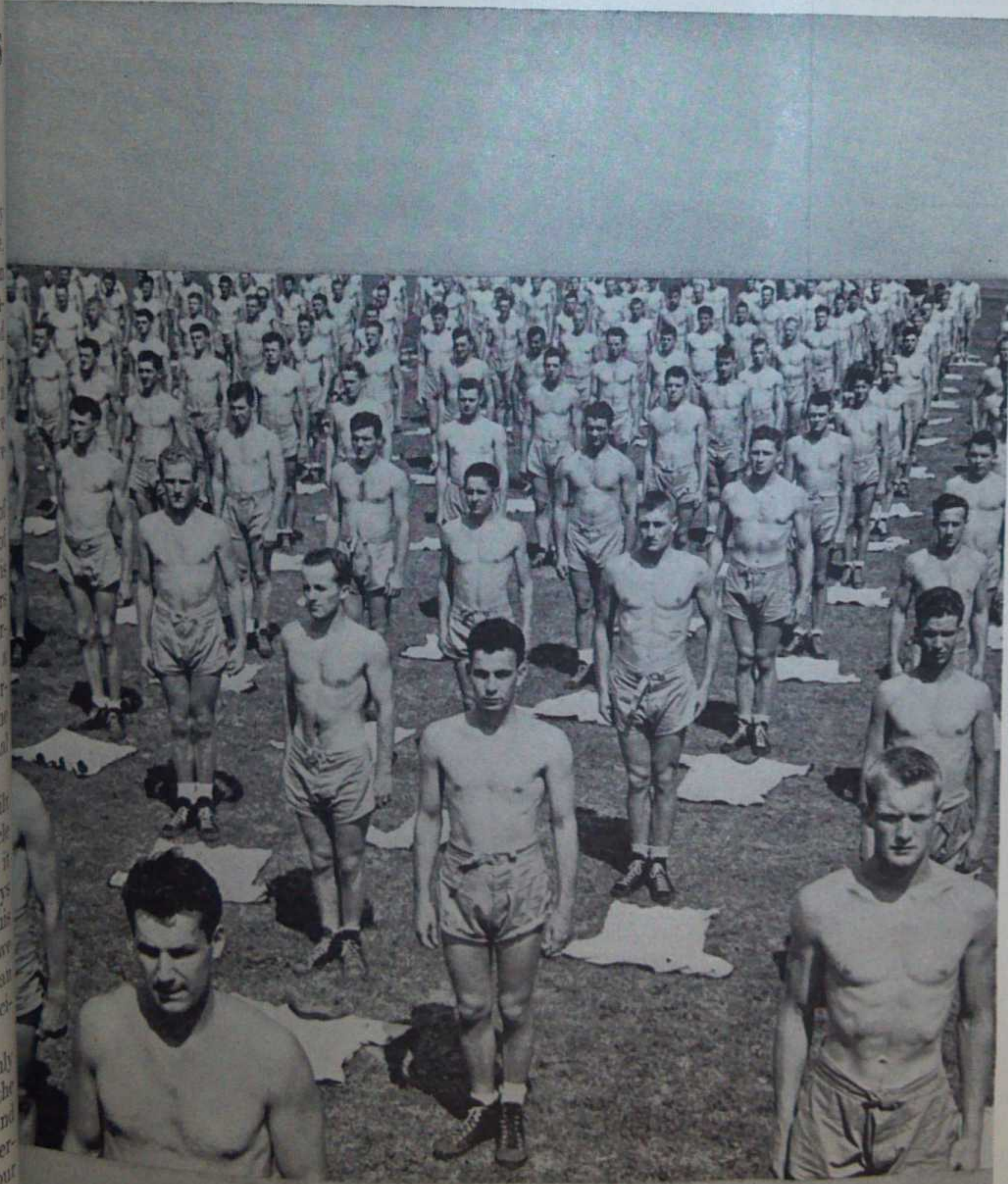
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Mass Exercise
Lieutenant M. J. Gary

Treatment for the Condition
Known as Shin Splints
H. B. Goodell



Cadets at the Iowa City
Pre-Flight School ready for
their limbering-up drills

Mass Exercise

By Lieutenant M. J. Gary, U.S.N.R.

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NUMEROUS requests for descriptions and pictures of the mass exercises used at the United States Navy Pre-Flight School for Naval Aviation cadets at Iowa City, Iowa, have been received from athletic coaches and physical training directors throughout the country. The editor of the Trainers Journal has asked for a series of several articles describing and illustrating the exercises at the Iowa Pre-Flight School, and because of the wide circulation of this publication among the high schools and colleges, this article has been prepared with the hope that it may be helpful to those physical educators who are interested.

The exercises used at the United States Navy Pre-Flight schools were prepared by a committee of seven members of the V-5 Instructors School at the United States Naval Academy at Annapolis last April, under the direction of Mr. Tommy Taylor of the physical training staff at the Academy. Mr. Taylor has used the exercises, for many years at the Academy, and the methods of giving the exercises and the commands used are based on his invaluable advice and suggestions to the committee.

The V-5 Instructors Committee of seven included Lieutenant Commander John Sabo from the Yale University coaching staff; Lieutenant Mike Brumbelow, Texas Christian University; Lieutenant William Neufeld, Harvard University; Lieutenant Joe Amori, California; Lieutenant Ray Snyder, Columbia University; Lieutenant Mike Gary, Western Michigan College, and Ensign Charles Ream, Ohio State University.



MASS Exercise, or formal calisthenic drill, is in many ways a cornerstone in the Navy's Pre-Flight School physical training program. It is that, however, only to the extent that it is a jumping-off point into other activities of the program.

The major emphasis in Mass Exercise is not on vigorous work-outs but rather on muscle stretching activities with some emphasis given to posture. It has two principal functions, the development of military carriage and posture, and as a preface to other activities of the program, a loosening-up process which, in itself, stresses development and conditioning.

In keeping with the latter function, sports activities in the Pre-Flight program are prefaced by limbering-up drills in Mass Exercise. The exercise given in mass calisthenics prior to activities in the sports program of the Pre-Flight School plays a leading part in preparing the cadet's body structure in such a way, that he may start active sports with more assurance that his muscles are in condition to take on the rigorous work that follows Mass Exercise. (Editor's note)

Of the many exercises, considered by the committee, fifty were finally selected, all of which are evolved from five basic or fundamental positions. Numerous combinations of these fifty exercises are possible, and additional exercises have been added occasionally by the directors at the several pre-flight schools, but the general pattern, prepared by the original committee has been retained. For instance, at the Iowa School it is difficult during early periods at 0550 and 0745 in the morning to place the cadets in lying positions because of the early morning dew, with the result that additional exercises from the erect position and the semi-support positions have been added to the original program.

As the cadet advances from the pre-flight schools to other bases during his primary, secondary, and operational flight training, he will be given these same exercises by navy physical training instructors throughout his entire flight training, even after he receives his wings and becomes a member of a squadron in the fleet.

The general objectives of the mass exercise program at the Iowa Pre-Flight School may be stated briefly in order of emphasis:

1. To prepare the cadet for strenuous physical activity in athletic competition by a series of loosening and stretching exercises preceding that competition.

2. To improve the posture and bearing of the cadet.

3. To train him in alertness and response to commands.

Preceding the cadet's participation in the daily two-hour physical training period at the Iowa School, he is given from fifteen to twenty minutes of mass exercise.

Two battalions of cadets (between 400 and 500 men) are given the exercises in formation. Immediately after the exercises, the cadets fall into platoon formation and proceed by platoons to the several competitive activities, such as football, soccer, basketball, military track, boxing, wrestling, hand-to-hand combat, swimming, gymnastics, or manual labor.

The following general precautions in the direction of the exercises were presented to the committee by Mr. Taylor, and experience at the Iowa Pre-Flight School has indicated that they are important.

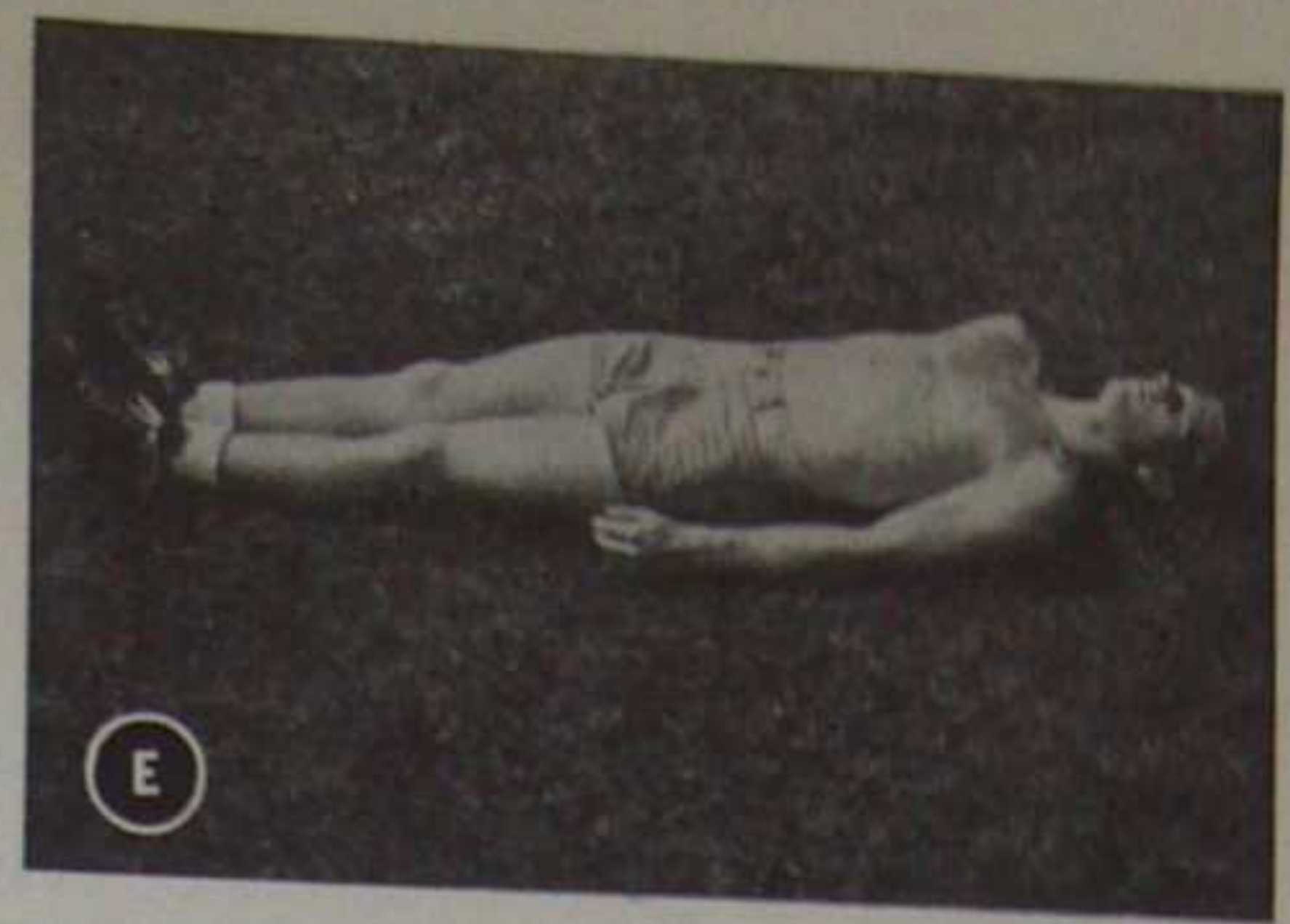
All classes should be conducted in military fashion. Use of *attention, parade rest, right face, left face, etc.*, should be used to control the group.

The director should not execute the movements along with the class. He should first demonstrate each new exercise for the group and thereafter stand at attention and give the necessary commands with only such subsequent demonstration as he finds necessary for correction or explanation. The group may be placed at parade rest while the director is demonstrating or explaining.

In selecting the exercises for the daily period the following principles should be observed:

1. Exercises should be selected from





each basic position.

2. Easy exercises should be used at the beginning of the period to prepare the body gradually for more strenuous work, the more vigorous exercises during the middle of the period, with a tapering off during the final few minutes of the period.

At the Iowa Pre-Flight School, several portable stands or platforms have been constructed for use by the directors of mass exercise. These stands are five feet high with the platform four feet wide and eight feet long. During demonstrations, the director may be seen by the four to five hundred cadets in the group and his commands can be heard by the entire group without the use of a public address system. The stands are portable so that they may be moved about the field.

There are a number of formations which may be used to space the men properly for exercise. At the Iowa School we use the following method. The cadets are mustered in platoons averaging about thirty men each. They march to the athletic field and fall-out at the edge of the field. They then fall-in, with the right guide at the directors' platform, at intervals of approximately six feet, with ranks six feet apart. Thus a space of about six feet is left between each cadet both right and left and fore and aft. After the group is called to attention, the command is then given, *At Double Intervals Dress Right, Dress*. The cadets in the right file cover off and hold fast, raising the left arm to a horizontal position. The cadets in all other files raise both arms to a horizontal

position and dress right, touching the fingers of the cadet to their right. As soon as they are properly dressed, the command, *Ready, Front*, is given. The group is then given the command, *Right Face*, followed by a left dress. The command *Half Left, Face*, follows and the cadets are in position for exercise, with each cadet able to see the director on the platform at the corner of the formation, and with sufficient space between cadets for freedom of movement.

Nomenclature

The following description of nomenclature is taken in part from an outline furnished by Mr. Taylor:

The name of each exercise, and the words of command for its execution, indicate the actual movements to be performed. In more simple movements, the name is also used as the actual word of command, and such words as *Raise, Lower, Bend, Stretch, Place, Turn, etc.*, become executive words—e.g., "*Heels, Raise.*"

When the name of the exercise and the exercise itself are more complicated, the present participle of the verb is employed for the name of the exercise and the name of the exercise (or necessary portions of it) is given as a caution followed by the executive commands, *One, Two, etc.*—e.g., *Heels Raising and Knees Bending*. The words of command for this exercise may be: *Heels—Raise; Knees—Bend; Knees—Stretch; Heels—Lower*; or the name of the exercise may be given as a

caution, followed by the executive words, *One, Two, Three, Four*.

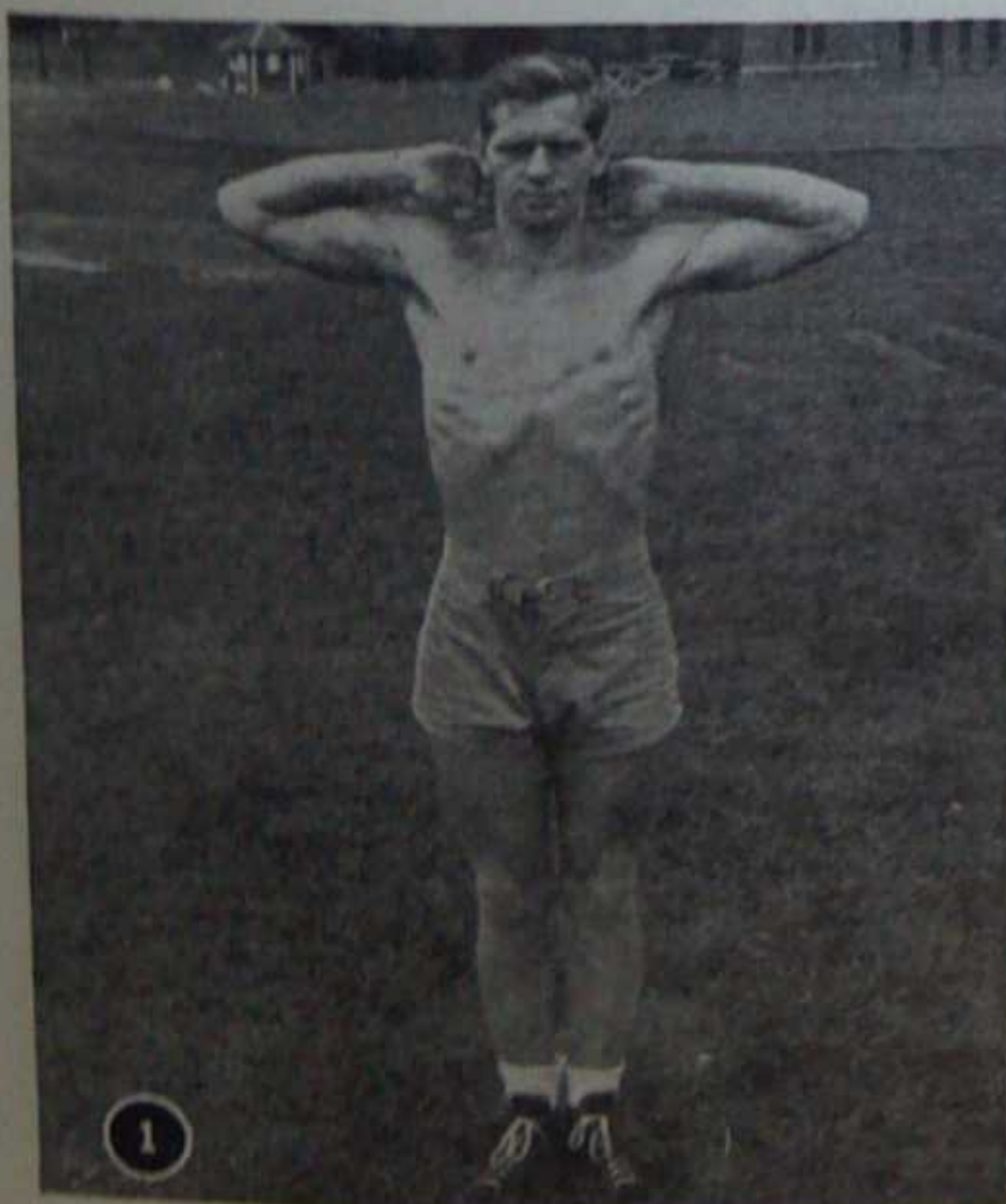
In a combined exercise in which two movements are to be taken at the same time, only one executive word is used—e.g., *Foot Placing Sideways, Arms Upward—Stretch*; or numbers may be used for the executive words, as indicated above. This method of employing numbers will save much time and many words of command, and should frequently be used when directing combined or complicated exercises.

Starting Positions

The positions of *Attention* is the starting position for the more simple movements, and it must always be taken as the starting position when no other is indicated. Additional positions are learned from time to time as exercises, and many of these positions are then used as starting positions for additional exercises.

Starting positions other than those given in the different groups of exercises may sometimes be taken, if it is considered necessary, but the principles of progression and the ultimate objective should be kept carefully in view in their selection.

The effect of an exercise depends on the starting position from which it is performed, and the special effect of an exercise is often contained in the starting position—e.g., *Forward Lying, Arms Bend*; or *Forward Lying, Trunk Backward Bend*. The starting position here contains the required dorsal effect, and the stretch-



ing of the arms is added to increase it.

Additional Movements

When additional movements are to be taken at the same time as the major movement of the exercise, the word "with" is added before the name of the additional movement—e.g., Heels raising and full knees bending with arms raising sideward and upward. In this exercise the movements of the arms are to be taken at the same time as the movements of the legs.

The five fundamental or basic positions are indicated in Illustrations A, B, C, D, and E.

Exercise	Cautionary	Execute
1	Neck	Rest
2	Arms	Bend
3	Arms forward	Bend

Position A is *Attention*, B *Crouch Sitting*, C *Stoop Falling*, D *Lying*, and E *Backward Lying*. From each of these basic positions a definite progression of movements is given, including the cautionary or preparatory command, the command of execution, and the command for return to the starting position. As the exercises progress, each position assumed becomes the starting position for the exercise which follows.

exercise which follows.

As examples, three exercises are shown in Illustrations 1, 2, and 3, all of which are executed from the position of *Attention* as shown in Illustration A.

The commands involved in these three exercises are shown in the table above.

In subsequent issues, a total of fifty exercises will be illustrated, with accompanying commands and explanations.

Returning to Starting
Arms downward
Arms downward
Arms downward

to speak of shin splints, I spent a great deal of time in trying to solve the trouble. Upon reviewing the anatomy of the leg and using a great amount of trial and error, I had the happy thought of supporting the longitudinal arch as a means of securing relief for shin splints, and, thus, I stumbled upon the cure for shin splints in that manner.

By supporting the longitudinal arch every case was cured within a two-week period, without loss of time to the athlete during the curative period. From 1937 to 1938, I never failed to cure a case of shin splints with the taping, as illustrated in the accompanying diagram. The specific instructions are as follows:

Use one and one-half inch tape. With tape Number 1, start on the outside of the foot just behind the head of the fifth metatarsal; bring the tape back along the outside of the foot and around the heel, and then forward on the internal lateral border of the foot to the back and dorsal head of the first metatarsal. Start tape Number 2 on the inside of the foot directly over the scaphoid; go up over the top of the foot and down on the outside; continue under the foot until the tape has gone all the way around the foot. Bring tape Number 3 up on the inside of the leg, just in front of the internal malleoli, and continue up the front of the leg to within three inches of the patella. Start tape Number 3 back of the head of the fifth metatarsal; go under the foot and up on the inside of the leg, just behind the internal malleoli; continue up the side and back of the leg to within three inches of the head of the fibula. Tapes Numbers 2 and 3 should not lift the arch of the foot too

Treatment for the Condition Known as Shin Splints

By H. B. Goodell

Athletic Director, South Dakota School of Mines

THE available literature on the treatment of the condition known to the athletic world as shin splints is indeed very meager and consists of repetition upon repetition, with nothing offered as a truly satisfactory treatment. The old and customary statement relative to shin splints runs something like this: Shin splints are caused by running on a hard surface early in the season with continued, constant jarring; and they are slow in recovery. Heat and massage with three-quarter circular strapping, squeezing the gastrocnemius, and, of course, rest are the adjuncts most needed in securing a cure; and this should be continued long enough to permit the torn muscle attachments to heal. These statements are about all one can find relative to treatment for shin splints. We all know that this is not a satisfactory treatment.

For the basis of this discussion and as a scientific background from which to work, we shall review the origin and insertion of the two major muscles which maintain the longitudinal arch of the human foot, and thus note the scientific reasoning upon which the treatment is based.

The first primary support of the longitudinal arch, the tibialis anticus muscle, as the name implies, is situated on the anterior and outer side of the tibia. It arises from the outer and upper two-thirds of the shaft of the tibia and from the deep fascia. Then these fibers pass downward and terminate in a tendon which is apparent on the anterior surface of the muscle on the lower third of the leg. It is inserted into the inner and under surface of the internal cuneiform bone, and into the base of the metatarsal bone of the great toe. The action of the tibialis anticus flexes the foot upon the leg; and from the obliquity in the

direction of its tendon this muscle raises the inner border of the foot (inverts) and draws (adducts) the forefoot toward the median line of the body.

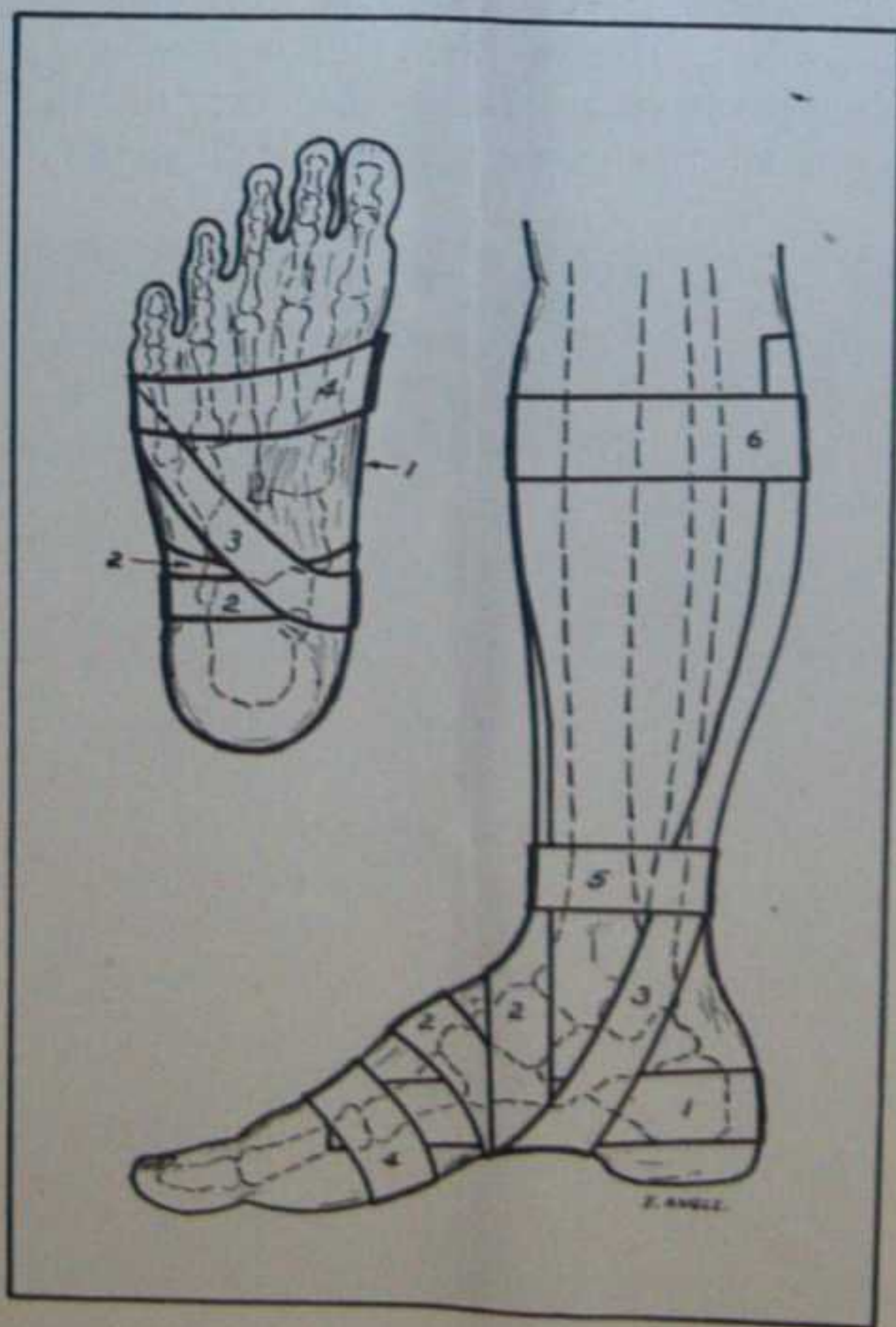
The second major muscle which maintains the arch of the foot is the tibialis posticus, which lies between the flexor longus hallucis and the flexor longus digitorum; it is the most deeply seated muscle of all the muscles of the leg. It originates by two pointed processes and arises from the interosseous membrane from the posterior surface of the shaft of the tibia and from the upper two-thirds of the internal surface of the fibula. The fibers pass downward and terminate in a tendon which passes through a groove behind the

inner malleolus, thence beneath the inferior calcaneoscaphoid and internal cuneiform bones. It also gives off fibrous expansions: one of which passes backward to the os calcis; others outward to the middle and external cuneiform and cuboid and some forward to the bases of the second, third, and fourth metatarsal bones.

Primarily, the action of the tibialis posticus is to extend the foot upon the leg and maintain the longitudinal arch. This muscle is very important because it is also a powerful adductor of the foot and because it acts with the tibialis anticus to antagonize the powerful perni muscles which adduct or draw the foot outward. Note the wide expanse covered by the fan-like insertion of this muscle and the manner in which its tendons support the inferior astragalo-scaphoid (spring) ligament, which plays so important a part in maintaining the inner segment of the longitudinal arch.

Upon observation, one may think the tibialis posticus originates too far posteriorly on the tibia and fibula to cause soreness on the front of the leg. However, upon careful examination one will find the muscle originating as much on the inner surface of the tibia and fibula as on the posterior surface. There are many other leg muscles and tendons which support the longitudinal arch, but this support is to a minor degree. By the hypothesis based upon the origin, insertion, and action of the tibialis anticus and tibialis posticus these muscles are the major offenders in the condition known as shin splints.

Because the old and accepted methods of treatment have been used, all coaches and trainers have been troubled with loss of time because of shin splints. In 1937 a year in which we had an "epidemic,"



QUALIFY
NATION

SENIOR MEMBERSHIP: 1. Men who have been actively engaged in athletic work for a period of two years. 2. Men who are qualified for the work, in co-operation with the athletic department and to direct it in a college or university. 3. Men who have had practical experience in athletic training department of a college or some other institution of higher learning. Senior members have voting rights.

JUNIOR MEMBERSHIP: 1. Men who are engaged in athletic training either in a college or university. 2. Men who are engaged in a high school athletic program in a high school or training course. 3. Men who are training for membership and passing an athletic course.

Any Junior member may become a Senior member by completing the requirements for membership and passing an athletic course.

to speak, of shin splints, I spent a great deal of time in trying to solve the trouble.

Upon reviewing the anatomy of the leg and using a great amount of trial and error, I had the happy thought of supporting the longitudinal arch as a means of securing relief for shin splints, and, thus, I stumbled upon the cure for shin splints in that manner.

By supporting the longitudinal arch, every case was cured within a two-week period, without loss of time to the athlete during the curative period. From 1937 to 1939, I never failed to cure a case of shin splints with the taping, as illustrated in the accompanying diagram. The specific instructions are as follows:

Use one and one-half inch tape. With tape Number 1, start on the outside of the foot just behind the head of the fifth metatarsal; bring the tape back along the outside of the foot and around the heel, and then forward on the internal lateral border of the foot to the back and dorsal head of the first metatarsal. Start tape Number 2 on the inside of the foot directly over the scaphoid; go up over the top of the foot and down on the outside; continue under the foot until the tape has gone all the way around the foot. Bring tape Number 2 up on the inside of the leg, just in front of the internal malleoli, and continue up the front of the leg to within three inches of the patella. Start tape Number 3 back of the head of the fifth metatarsal; go under the foot and up on the inside of the leg, just behind the internal malleoli; continue up the side and back of the leg to within three inches of the head of the fibula. Tapes Numbers 2 and 3 should not lift the arch of the foot too

high. Start tape Number 4 on the outside of the foot, just behind the head of the fifth metatarsal, over the end of tape Number 3; pass it down and under the foot; bring it up on the inside of the foot, just behind the head of the first metatarsal; continue over the dorsal portion of the foot; finish and fasten the end of the tape over the starting position; overlap the tape one or two inches. This gives a band completely around the foot just behind the heads of the metatarsals. Use tapes Numbers 5 and 6 as anchors or binders for tapes 2 and 3, by going around the leg at the top with tape Number 5 and around the leg just above the malleolis with tape Number 6.

I also accompany the taping with diathermy, which is given once a day for forty minutes. When the athlete is not out for practice, I keep an analgesic pack on the anterior surface of the leg.

With this treatment, there was not one case which did not improve satisfactorily within two weeks, while the athlete continued his regular practice and game participation.

I have also found that shin splints may be prevented by the use of proper bandaging. In the fall of 1939, beginning with the football season, I started using the bandage which was used and described by J. M. Cox, Harvard trainer, in the book *Athletic Injuries—Prevention, Diagnosis and Treatment*, by Thorndike, Chapter XXII, p. 189, Figs. 100 and 101. The bandage was also illustrated and described in *The First Aider*, published by the Cramer Chemical Company, January, 1942, p. 37. I first learned of the bandage from Duke Simpson, formerly of Harvard.

I used this bandage on all members of the squad. By using a two-inch ankle wrap, eighty inches long for each foot, I added slightly to this bandage by finishing with a regular figure eight. The principal reason for using this bandage in the beginning was to protect the ankle from sprain, which it did. However, the surprising thing was the fact that we did not have one case of shin splints develop during the season, something that had never happened before in the history of football seasons, in my experience.

Upon the completion of the football season, I insisted upon the basketball squad using the same type of bandage, and, again, there were no cases of shin splints. This type was also used for the members of the track squad; it produced the same results. The practice has been followed with all athletes, since that time, in all sports. In the time since 1939, we have had but one case of shin splints start to develop. I am sure that was due to the bandage not having been applied properly. This case cleared up within a week with the use of the adhesive strapping and analgesic pack, before mentioned.

The coaches and athletes in all sports feel the bandage does not hinder the athlete's performance in any way, in any sport. Both athletes and coaches are enthusiastic about the results of its use.

By the use of these methods for the prevention and cure, I am sure that shin splints will become one of the minor ailments of athletes, instead of a major and annoying condition as in the past.

Acknowledgment for the critical reading of the manuscript is due Professor Howard H. Wells of the Department of English, South Dakota State School of Mines; for the drawing Ellwyn Angle, a student in the School of Mines.

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.