

TRAINERS JOURNAL

SECTION

The NATIONAL ATHLETIC TRAINERS ASSOCIATION

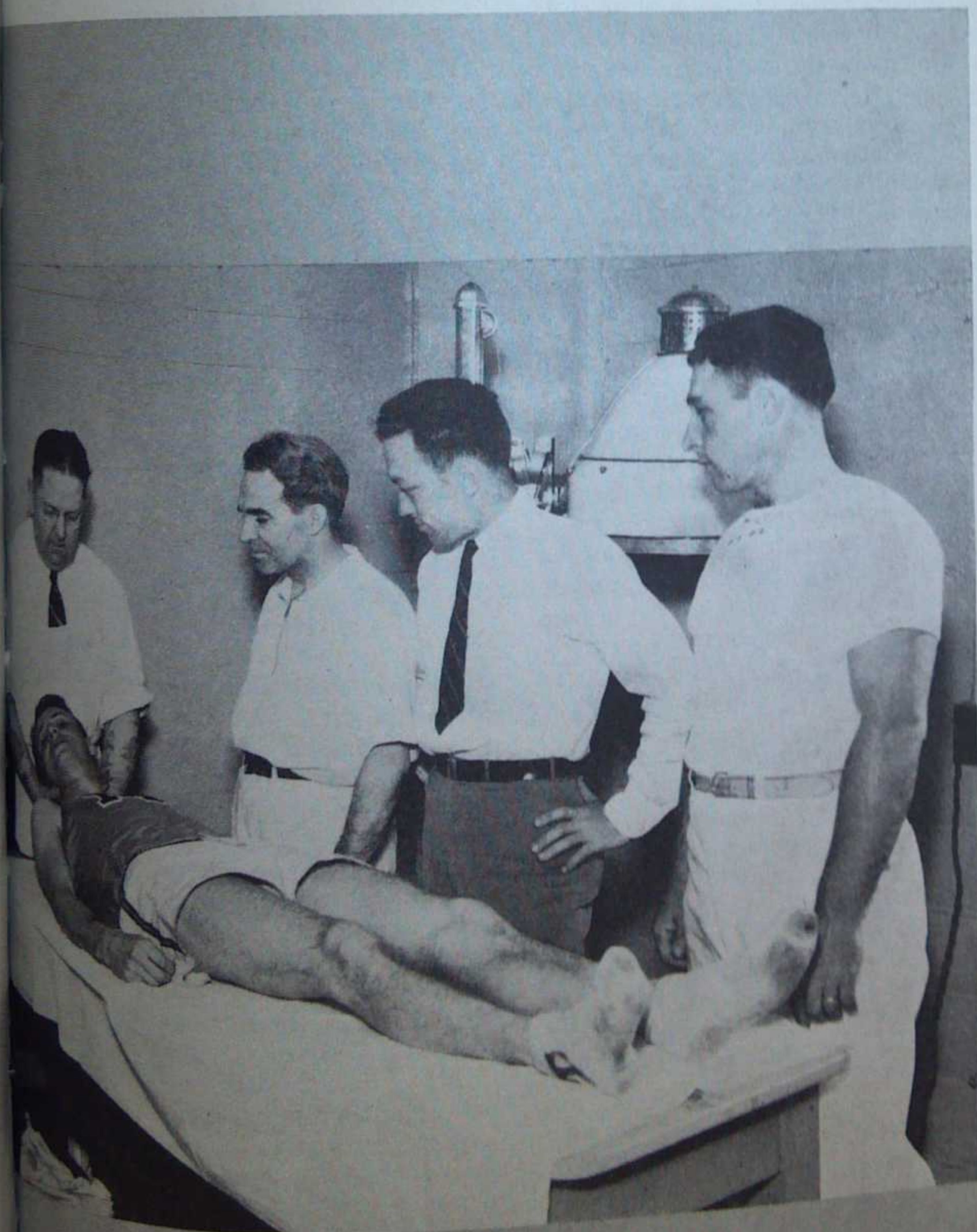
DECEMBER, 1943

No. 4

Official Publication
Of the National Athletic
Trainers Association

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Result of Physical
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the Ankle Joint
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An illustration from the files of the Cramer Chemical Company. Left to right, Ollie De Victor, University of Missouri; A. C. Cornell, University of Nebraska; Captain Beryl Taylor, former trainer at Iowa State College and Lieutenant Elwyn Dees, former trainer at the University of Nebraska.

What to Expect as a Result of Physical Training

By W. W. Tuttle, Ph.D.

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IN SETTING up a program of physical training, whether for improving physical condition so that men can play a better game of football, or fight harder on the field of battle, we sometimes wonder what should really be expected as a result of the procedures incorporated in the program. Regardless of what the objectives are, the individuals participating in the program undergo similar anatomic and physiologic changes. It is our purpose to point out here some of the structural and functional changes which we can expect to occur as a result of a well-conducted physical training program.

It must be borne in mind, in assessing the results of a physical training program, that the degree of change resulting varies, because at the beginning of the program there are usually wide differences in the physical condition of the individuals to be trained. It is to be expected that those in the poorest condition, when the program is initiated, will change more than those who are in better physical condition. However, if a physical training program fails to bring about improvement, it is more likely to be the fault of the program rather than the excellent condition of the participants at the beginning of the training.

Capacity to Do Work

The first, and most obvious result of a training program is an increase in the capacity to do work. Part of this is due to an increase in skill; the individual learns to use his body more effectively; he becomes more skillful in applying and directing muscular force; and he learns how to eliminate waste motion and unnecessary tensions. In addition, the body becomes adapted to working at a higher dynamic level. There is a reaction to work which tends to carry the recovery process beyond the point of mere restoration.

Recovery from heavy muscular work brings about a greater storage of fuel substance in the muscle and there is a thickening and toughening of the walls of the individual muscle fibers and the connective tissue elements of the muscle as a whole. There is also a strengthening of the ligaments and bony structures. In addition, a more adequate circulation is established within the exercised muscles, thus providing for an increased supply of oxygen and fuel, as well as a more rapid removal of

waste products.

It is important to remember that an increase in the capacity to do work occurs only if plenty of fuel and tissue-building substances are at hand during recovery, and if sufficient time is allowed for the completion of this process. Exercise itself is a destructive process; it is what happens during recovery that increases the capacity to do work.

Body Weight

Physical training tends to cause an increase in body weight. Although there may be some loss, due to the disappearance of fat, the net result is a gain in weight. The explanation for this change is quite clear. It is generally conceded that exercise stimulates the desire for food, and if the desire is satisfied, the amount eaten is in excess of the energy requirement. As a result, there is an increase in body weight. This explains why exercise alone is a poor way to reduce body weight. It explains, also, why individuals who cease strenuous exercise abruptly gain weight, unless they adjust their diet to the less strenuous program of exercise.

The Weight Chart

The weight chart serves a useful purpose in the training program. By the keeping of daily records, both before and after exercise, a good account of the response of the participants to the training program is furnished. For example, a case of consistent weight loss may serve as a clue to a defect in individual training, either as to training rules or impending ill health.

Respiration

Although there is some difference of opinion, recent experiments, carried out through extended periods of training, where ordinary healthy young men served as subjects, showed that the training caused no significant changes in resting respiratory rates. Regardless of the extent and effectiveness of a physical training program, significant changes in respiratory rate are not to be expected.

On the other hand, physical training does increase vital capacity very promptly. One must remember, however, that individuals who are physically well trained can not be accurately separated from those who are not, on the basis of vital capacity.

The reason for this is that by practicing deep breathing, one can increase his vital capacity without participating in any other type of training.

Another significant change to be expected as regards the effect of physical training on respiration is an increase in breath-holding time. This result is important, not only because it is an index to the development of the respiratory system, but also, it is regarded in many quarters as an index to good general health. It might be added that individuals in good physical training should be able to hold their breath for approximately seventy seconds.

Blood Pressure

We have been led to believe that blood pressure reacts favorably to physical training. Some have been inclined to overlook the fact that resting blood pressure is, for the most part, a fixed thing, except as it changes with such factors as age and disease. When the factors responsible for the maintenance of resting blood pressure are considered we naturally come to this conclusion. Notwithstanding the fact that isolated cases have been reported in which blood pressure was apparently reduced by physical training, this is not typical of what happens to the average individual. As a rule, neither systolic nor diastolic blood pressure is changed significantly as a result of physical training.

Heart Rate

One may reasonably expect that an effective physical training program will cause a significant reduction of the resting heart rate. This decrease is, on the average about ten beats per minute. It should be stated, however, that physiologic adjustments do not necessarily mean improvement in athletic performance, since it is generally recognized that a training program may cause maximum physiologic adjustments without any improvement in athletic performance.

There is a tendency on the part of some to believe that physical training alters the increase in heart rate due to exercise. This does not occur, since it has been demonstrated that the increase in heart rate due to exercise remains about the same, regardless of the individual's state of physical training. What actually happens is that, since the resting heart rate becomes

significantly lower, obtained due to a state. But if the actual is considered per se, it is little with the state. It should also be is a low correlation increase in heart rate resting rate. For with a resting rate increase in heart rate sixty beats, while resting heart rate an increase of only is the consensus that which increases in exercise, and which the bout of exercise

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Relation Between Athletic Performance and Physiologic Adjustments

As shown by data presented by Jokl and others, we are coming to believe that physical and physiologic standards are largely independent of each other. In other words, an improvement in sprinting, speed swimming, etc. is not necessarily proportional to changes in such items as vital capacity and resting heart rate.

Posture

There is considerable evidence that physical training brings about postural changes. The participants increase in height and trunk length. These increases

in case of the adult are not the result of real growth, but rather are due to the straightening of the spine, and to other skeletal adjustments. Although the postural changes are small, the net result is a tendency to create a better condition for the functioning of the organs in the chest and abdominal cavity.

In general, we may expect a well-conducted physical training program to result in an increase in the capacity to do work, and in various adjustments of the body to exercise. The physiologic changes do not necessarily run parallel to improvement in athletic performance, however, because a good natural performer may have a greater capacity for making bodily adjustments than one not so good.

The College's Part in the Army Training Program

By Phil Sarboe

Coach of Football and Track and Athletic Trainer Washington Central College, Ellensburg

AS explained in the preceding article (November issue) the exercises given in that article and concluded in this, are used to prepare aviation cadets in the army for flight training. Emphasis was put upon the gradual conditioning of the men and a warning was sounded that, since these exercises are more strenuous and varied in nature than those in general use, physical directors and trainers must carefully supervise the exercises and not place unreasonable demands upon the individuals.

8. LEG SPREADER. *Starting Position:* Supine, hands under hips, knees straight, feet together two inches off the ground. Exercise: 1. Raise legs vertically. 2. Spread legs thirty-six inches. 3. Return to 1 position. 4. Return to starting position. 5. Spread legs thirty-six inches. 6. Return to starting position.

9. THE BODY ARCH. *Starting Position:* Prone position with the arms extended overhead, palms on the ground. Exercise: 1. Raise legs, arms and chest and as high off the ground as possible (legs and arms straight, hands and feet together). 2. Return to the starting position. 3. Same as 1. 4. Return to the starting position.

10. THE KILLER. *Starting Position:* Attention Exercise: 1. Squatting position. 2. Extend the legs rearward to the front-leaning rest. 3. Lower to the prone position, touching the chest at the same time raising the left leg (knee stiff). 4. Recover to the front leaning rest. 5. Lower to the prone position, touching the chest at the same time raising the right leg (knee stiff). 6. Recover to the front-leaning rest. 7. Recover to the squatting position. 8. Recover to the starting position.

Another Method for Taping the Ankle Joint

By Wilbur Bohm

Athletic Trainer, Washington State College

THE following method for taping the ankle joint may be used for the chronically weak ankle joint and for the sound one as well, for protection. In other words, it may be used to prevent a sprain of the ankle joint. It may also be used as part of the treatment for the acute sprain of the ankle joint, if applied after the swelling has begun to subside.

One and one-half inch strips of adhesive tape should be used; the skin should be shaved well up on the calf of the leg, and athletic benzoin should be applied to the part shaved. A 3 by 3-inch piece of gauze should be placed over the dorsal surface of the posterior transverse arch before the

tape is applied, to prevent injury to the skin, that sometimes occurs when it is not applied. A 3 by 3-inch strip serves the purpose well. The foot should be held at a right angle to the leg while the adhesive tape is being applied. Strip 1 is started well up on the side of the leg, brought down to, and under, the heel, up over the inside of the ankle, diagonally across the lower part of the leg, up over the starting point of the particular strip, and fixed to the skin.

Strip 2 is started directly opposite strip 1, well up on the inside of the leg, brought down under the heel, up over the outside of the ankle, diagonally across the lower

part of the leg, up over the starting point, and fixed to the skin.

Strips 3, 4, 5 and 6, are applied in the same direction as strips 1 and 2. One, 3 and 5 are started, and end, on the outside of the leg, and strips 2, 4 and 6 are started and end, on the inside of the leg, each strip overlapping the preceding strip by one half.

Strip 7 is started over the dorsal surface of the foot, instead of high up on the calf, and is carried down under the foot, overlapping strip 5 at this point and throughout the rest of its course, under, up, over the inside and top of the foot, and is carried on across strips 1, 3 and 5.



Strip 8 is started on the dorsal surface of the foot opposite to the starting point of strip 7, and is carried down and under the foot, overlapping strip 6 at this point and throughout the rest of its course, under, over the outside and top of the foot, and is carried on across strips 2, 4 and 6, and fixed to the skin.

Strips 9 and 10 overlap strips 7 and 8 by one half throughout their course. It will be noted that the first three strips on the outside and inside, numbers 1, 3 and 5, and 2, 4 and 6, respectively, overlap the preceding strips by one half, as do the last two succeeding strips on the outside and inside of the foot, 7 and 9, and 8 and 10, respectively.

The eleventh illustration shows the application of strips 11 through 22, which are one and one half inches in width and applied so as to hold down strips 1, 3 and 5, on the outside of the leg, and 2, 4 and 6 on the inside. They are applied so that they will cover the front of the leg and dorsal surface of the ankle and foot, and carried over strips 1, 3 and 5 on the outside and strips 2, 4 and 6 on the inside, so that they adhere well to the skin. Continuing down, they extend over the malleoli and outer and inner margins of the foot, up to the articulations of the first and fifth phalanges with the first and fifth metatarsal bones.

Strips 23 and 24, are applied up on the back of the leg so as to cover the margins of strips 11 to 22, that have been carried down over the margins of strips 1, 3 and 5 on the outside, and strips 2, 4 and 6 on the inside of the leg, and succeeding strips that have been carried down over the ankle and foot. Thus, the back of the leg, ankle and heel is left free of tape.

Strips 25, 26, 27 and 28 are applied over the back of the leg to hold down strips 23 and 24. They should not be applied too tightly, merely serving to hold down strips 23 and 24. If applied too tightly they will interfere with the return circulation and prevent normal flexion and extension of the ankle joint.

The advantages of this particular method of taping the ankle joint are:

First, normal flexion and extension of the ankle joint are not interfered with. Hence the particular bandage is a splendid one to apply to the kicker in football. Most of our adhesive tape ankle bandages limit flexion, and extension, while this one does not. It limits eversion and inversion, however, and thus prevents sprains on the outside and inside of the ankle joint. Since normal flexion and extension are not interfered with, this is an excellent method for taping the weak ankle of any athlete, as it does not interfere with his speed, or proper function of the foot in the particular game or event.

Second, it may be applied quickly. This is a point to be reckoned with, when one has to apply adhesive tape to a great number of ankle joints in a limited length of



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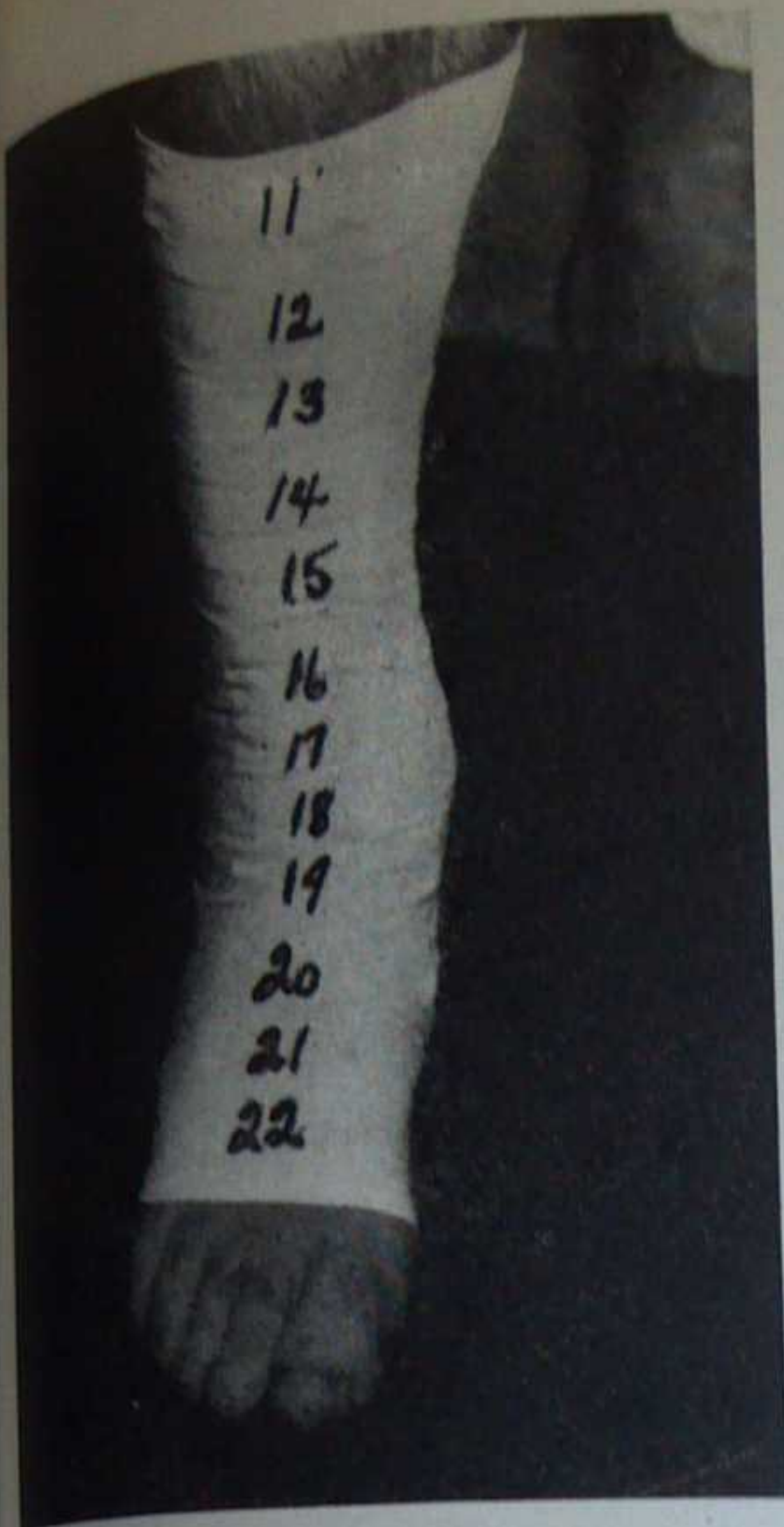
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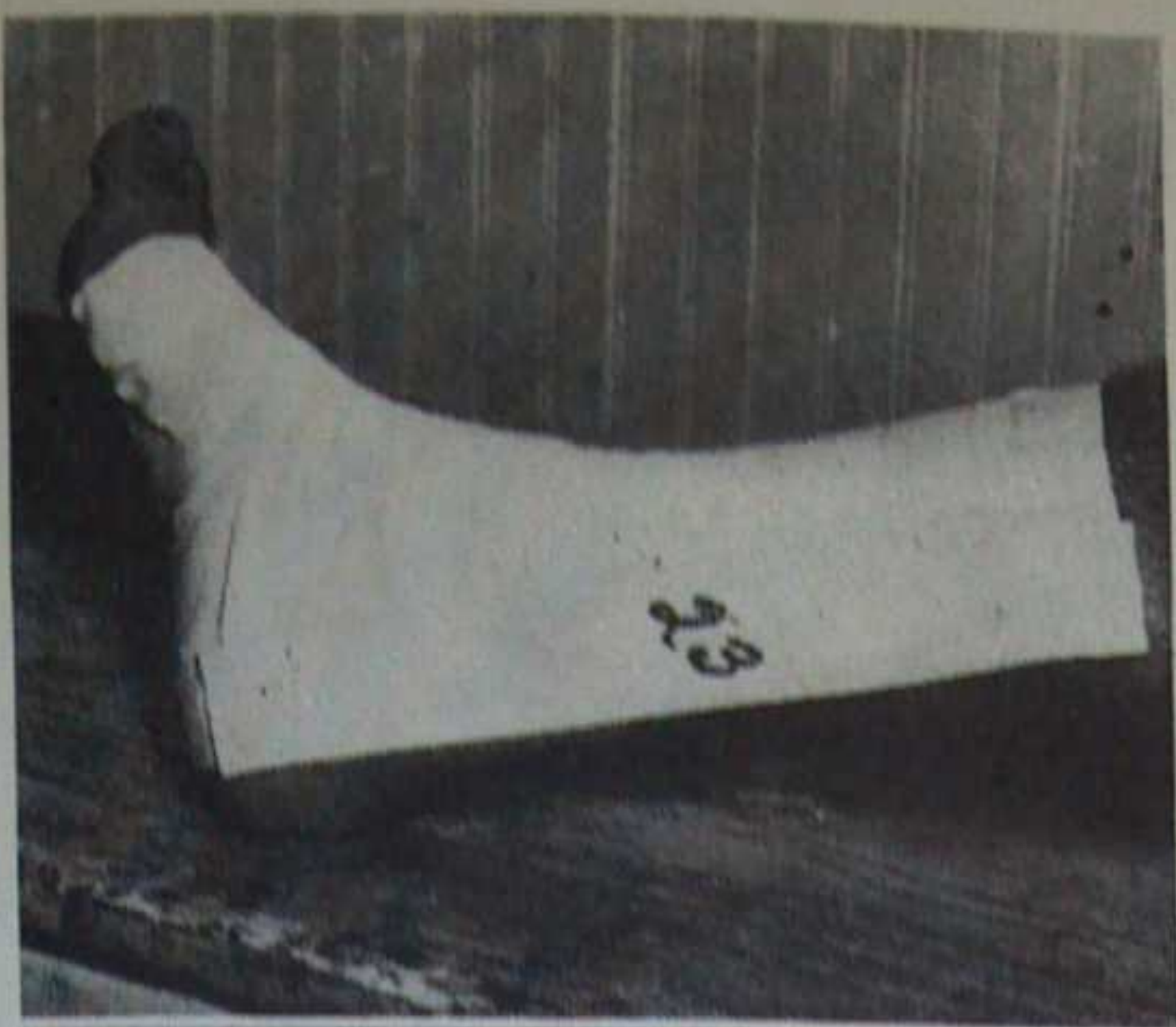
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time, for instance, when a trainer is taping up the football squad before a game.

Third, it does not require as much adhesive tape as most of the other ankle joint supports and naturally is less expensive.

Fourth, it may be applied to the acutely



sprained ankle as soon as the swelling begins to subside; it does not interfere with the return circulation as the back of the



leg and ankle are left open, thus preventing swelling of the toes and foot and hastening healing; it allows more comfort for the ailing athlete, and at the same time offers splendid support for the injured structures.

Recreation for Fighting Men in the South Pacific

WE are taking the liberty of printing parts of a personal letter received by the editor of the ATHLETIC JOURNAL from Lieutenant Roland Logan, since it contains much that will be of interest to all readers. Lieutenant Logan, it will be remembered, served as athletic trainer for the Boston Red Sox, University of Pittsburgh and the United States Military Academy. After entering the service, he was assigned to the Navy Pre-Flight School, Chapel Hill, North Carolina.

"Lieutenant Commander James Crowley former one-fourth member of the famous Four Horsemen of Notre Dame and later, the highly successful coach at Fordham University may never get a medal for doing a grand job in these jungles, but he deserves a shipload of credit for the good he is doing for the men of the fleet.

"Out here where it's work and more work, Jim has built a 'mountain out of a mole hill.' When he arrived at this place many months past, all that he found was a semi-level area in the jungle. Jim was ordered to build a recreation center, so

he pulled up his sleeves and 'full-steamed ahead' in the construction of the largest and finest recreation center, not only in the South Pacific, but perhaps in any country outside the continental limits of the good old U. S. A. He took a few men, and in his friendly and kindly way started from scratch. Building material was scarce; bombings were frequent, some men were skeptical, but Jim kept punching. His contact with kindly skippers brought working parties for the clearing of the jungles. Carpenters, electricians, plumbers, and truck drivers were sent over to do their bit, and later, a few were ordered here to maintain and keep the program in full swing. Fields had to be leveled, huts had to be built to house the equipment, athletic gear was needed and all of this took time.

"This program did not have to be sold to the men of the fleet. They needed recreation, play and relaxation, and they got it. Men had been blown off their ships. They had seen their ships sunk and had been sent to this vicinity to rest and get new assignments. Many of them have medals for bravery on their chests, and

scars of battles on their tired bodies. This center is the only place where they can actually 'let their hair down' and again be just plain American boys.

"The center, named the 'Fleet Recreation Center' has nine baseball fields (all named after major league parks), ten horseshoe pits, two basketball courts, four handball courts, three tennis courts, three boxing rings, three volley ball courts, a football and soccer field. Yes! we have a football team. We started practice last Monday, October 11th, and seventy men showed up for practice, eager to learn football from the ex-Fordham coach. It is too hot here for actual game conditions, but we will teach them plays and probably play a game of touch football before long. A home and home contract is offered to any team who cares to play us any time and anywhere. We stipulate, however, that the first game be played in the U. S. A.

"Lieutenant Commander Jim Crowley will not have a good football team this year, but he is building and rebuilding tired bodies, he is re-creating, just as the word implies."