

ATHLETIC TRAINING
AND THE
TREATMENT OF ATHLETIC INJURIES

By

S. E. BILIK, D. P.

*Formerly Trainer of Athletic Teams of the University
of Illinois; Formerly Hospital Sergeant, Medical
Corps, U. S. A.; Athletic Director, Madison
Square Garden Gymnasium; Medical
Student ---- (Third Year)*

Library
Teachers College
San Diego, Calif.
==

COPYRIGHT 1917

COPYRIGHT 1917

GV
343
B47
1917

To
NOVEMBER 4, 1916

(Illinois 14—Minnesota 9)

And the men who made the day memorable

30806

Coach, Robert Carl Zuppke

R. R. Kraft	-	-	-	L. E.
E. T. Rundquist	-	-	-	L. T.
L. O. Petty	-	-	-	L. G.
H. R. Schlaudeman	-	-	-	C.
F. S. Stewart	-	-	-	R. G.
M. R. Petty	-	-	-	R. T.
P. G. Christensen	-	-	-	R. E.
F. B. Macomber	-	-	-	Q. B.
E. C. Sternaman	-	-	-	L. H. B.
W. W. Anderson	-	-	-	R. H. B.
R. Oscar Knop	-	-	-	F. B.

Not because of the victory—that is a mere incident—but because they went into the battle with all the odds against them, with defeat staring them in the face and fought bravely and intelligently, winning from a “better” team.

PREFACE TO THIRD EDITION

Five years have rolled by. As we live we learn. My experience in the Medical Corps of the Army, and the two years of medical study at Bellevue which followed, have opened up new vistas. And as I buckled in to the task of revision, it was with the pleasure of knowing that the additional theory and experience I gained would help me in improving the contents. When I first offered this little volume to the profession, I had no suspicion that it would meet with such spontaneous approval and praise. It was clear that the book was not to be just another "dead one" on the shelf, but an active servant to the needs of the profession. Later when colleges, normal schools, and schools of physical education began using it as a text, I felt it was up to me to make good by making this treatise the most thorough and complete on the subject.

You will find a great deal of new material in the third edition. Please read it cover to cover. I have interspersed new valuable training hints here and there among the older lines.

With thankful appreciation of your approval.

S. E. BILIK, D. P.

July 15th, 1923.

PREFACE TO SECOND EDITION

The first edition of my treatise having met with the approval of the profession, I am submitting a second, and I trust much improved, edition. The work of revision was carried on during the spare hours while attending to my duties as a sergeant of the Medical Corps. I have done the best I could under the circumstances. I ask for leniency in criticising the composition, but have no apologies to offer for the contents. The additions I have made should prove of value to the trainer.

I gratefully acknowledge the generous aid of Dean Thomas Arkle Clark of the University of Illinois in criticising the manuscript of the second edition.

S. E. BILIK.

July 15th, 1918.

PREFACE TO FIRST EDITION

In this volume I have endeavored briefly but thoroughly to cover the whole field of athletic training. The material included is based not only on my personal experience, but on the suggestions which I have obtained from a close study of over a hundred publications on athletic and medical subjects. For over a year and a half I have been literally "digging into" every volume which might give me some hint as to ways and means of increasing my efficiency as a trainer. When I came across a suggestion which appeared reasonable, I tested it, and, according to its merit, either adapted or discarded it. In this volume I have included only those things in which I thoroughly believe.

It is customary and rightfully so, to acknowledge the sources from which material is obtained; but I really cannot do so. At the time I was taking the notes I had no thought of writing this book and consequently did not record the sources; and now that I should like to express my gratitude, I can only do so in a general way, by acknowledging my obligation to the medical and athletic professions as a whole.

Special thanks are due to Dr. Whitelock for his excellent treatise on "Sprains," and to Dr. J. H. Kellogg for the numerous suggestions which I derived from his writings.

S. E. BILIK.

January 15th, 1917.

area on the nasal septum. Severe cases of nose-bleed require the attention of a physician. The nose is frequently the seat of catarrhal inflammation which may prove bothersome to the athlete.

Eyes—defective vision is more or less of a handicap in athletics. Foreign particles may lodge in the eye. They are subject to bruises and inflammation.

Lips—occasionally swollen or split due to violence.

Tongue—may be bitten. The coating of the tongue is a valuable aid in diagnosing ailments.

Throat—becomes parched at start of games. This is what is known as "pharyngeal thirst" as differentiated from true thirst, the craving of the body for fluid. "Pharyngeal thirst" is due to inhalation of dust (especially on basketball floors) and to nervousness which serves to inhibit the flow of saliva. Chewing gum or gargling oatmeal water easily overcomes this.

Tonsils—lymph-gland-like organs flanking the back of the mouth. Size varies greatly in individuals. Tonsils, even if very large, are not harmful unless diseased or infected. A pair of large, ruddy, healthy tonsils are two good protectors against the vast number of infectious bacteria thriving in the mouth. Diseased tonsils should be removed. Tonsilitis—an acute inflammation of the tonsils—is not infrequent among athletes.

Teeth—may be loosened or knocked out. Bad teeth are the cause of numerous ailments.

Lower Jaw Bone—subject to fractures and dislocations.

NECK

Lymph Glands—are sieves for the waste matter of the body. Wherever you find them palpable (swollen, so you can feel them with your fingers) look out for an infection. Don't overlook or ignore swollen glands. Find the cause as promptly as possible. Infected wounds, venereal disease, tuberculosis, tumors, etc., will cause swollen glands. Refer to physician.

Medulla Oblongata—(the stem of the brain) is located at the nape of the neck. It is the part of the brain which contains the "centres" controlling the heart, the blood circulation, the respira-

tion, etc.—the most vital functions of the body. Its position is rather superficial and it is therefore exposed to injury. Since such injuries are apt to prove very serious, be sure to protect the part well. The rabbit-punch used by prize fighters gains its effect by paralyzing the vital centers mentioned.

Carotid Arteries—are located one on each side of the trachea. In relieving congestion of the brain, cold applications to the carotids will often prove more effective than when placed over the forehead.

Cervical Vertebrae—are subject to subluxations (a slight deviation from their normal alignment with resultant pressure on the neighboring nerves which may often be the cause of headaches, stiff neck, etc. According to osteopaths, subluxations of the cervical vertebrae are the direct or indirect cause of most ailments of the whole upper part of the body. At times (in football) these vertebrae are severely jarred and impacted by a vicious head-on tackle. In such cases if a thorough massage and stretching of the surrounding muscles and ligaments does not bring relief, an osteopath or a chiropractor should be consulted.

Sterno-Cleido-Mastoid Muscles—have their origin back of the ear and their insertion into the sternum and the inner extremity of the clavicle. They are involved in "wry neck"—a condition which may be due to a violent twist of the neck or to a congestion caused by chilling the part.

SHOULDER

Clavicle—is subject to fractures and dislocations.

Shoulder Joint—is subject to dislocations and sprains.

Tip of the Shoulder—is occasionally broken off. It is involved in sprains of the acromio-clavicular joint.

Deltoid Muscle—covers the tip of the shoulder and the upper part of the arm. This muscle if well developed protects the shoulder from injury, serving as a cushion to lessen the force of a blow or a bump.

Suprascapular Nerve—its approximate superficial location is in the groove of the shoulder. This nerve is frequently bruised in football, such an injury incapacitating an athlete for a length of

time varying from eight to twenty days, depending on the severity of the case. Many preventive protections have been put on the market, but few have proved even partially effective. A simple and fairly effective protection is to place a rubber doughnut inside the shoulder pad so that it forms a bridge over the depression in the middle of the shoulder. In the majority of cases, however, the injury is caused by a blow or a severe bump on the side of the arm or even on the elbow. How such cases can be prevented is a problem.

ARMS

Biceps and Triceps—these muscles of the upper arm should be well developed, strength and suppleness rather than bulk being the main aim to attain in training. The biceps muscle is occasionally sprained.

The Long Tendon of the Biceps—will be found enclosed in the sheath of the pectoralis muscle and is attached to the scapula above. As a result of violence the enclosing sheath may tear and allow the tendon to escape. The latter will then be found "swimming around" over the tip of the shoulder. Such injuries are not infrequent among baseball players and are very serious since failure to apply proper treatment may permanently disable the athlete. This tendon is also likely to tear loose from its attachment to the scapula.

Head of the Humerus—is involved in shoulder joint dislocation and in fractures of the humerus.

Wrist—the small bones of the wrist are occasionally dislocated or fractured. Such injuries should be treated with due care since they are likely to result in permanent stiffness of the joint. Sprains of the wrist are frequent.

Elbow Joint—is subject to dislocations and swelling. Injuries to the ulnar nerve just behind the internal condyle of the humerus may occur.

Annular Ligament of the Wrist—weakness of the wrist generally follows overstretching of this ligament as a consequence of a sprain.

Thumb of Hand—is subject to troublesome chronic sprains—a great source of annoyance to basketball and football men.

CHEST

Ribs—may be fractured, or dislocated. Osteopaths assert that subluxations of the ribs, where they form joints with the vertebrae, cause bodily disorders in the same manner as do subluxations of vertebrae—by interfering with the nerve supply to the parts affected.

Chest Muscles—the pectoralis, major and minor, should be well developed.

Heart—before a youth is allowed to participate in competitive athletics his heart should be examined by a medical adviser. Hypertrophy and dilation are the two conditions of the heart most common in athletics.

ABDOMINAL REGION

Rectus Abdominis Muscles—form the front wall of the abdomen. If well developed they assure not only protection to the vital organs located in the visceral and pelvic cavities, but also good functioning of them, which means perfect digestion, absorption and elimination. Bending exercises are best for the development of these muscles. They may very rarely be sprained.

Oblique Muscles of the Abdomen—flank the rectus abdominis. They are subject to painful sprains and partial ruptures.

The Stomach, the Liver, the Intestines—these, as well as all the other vital organs of the body, if the athlete is to remain efficient to the highest possible degree, should always be kept in the best of order. Digestive disorders and constipation are the worst enemies of mankind. The origin of most ailments can be traced back to putrefaction of undigested food in the intestines; and yet a little judicious attention to the diet of the individual would prevent this. Digestive disorders are one of the chief causes of staleness, and vice versa staleness may cause indigestion and constipation.

Large Intestine—a knowledge of its course in the body is essential to the intelligent application of massage.

THIGH

Lymphatic Glands—those located in the upper part of the thighs close to the groin frequently become congested, inflamed,

and swollen, due to some sort of infection of the lower limbs. In searching for the cause don't overlook slight suppurating wounds.

Sartorius or "Tailor's" Muscle—this, the longest muscle of the body, is attached above to the ilium, runs across the front of the thigh to the inner side of the shin bone, attaching just below the knee joint. Its function is to flex the thigh on the trunk and to cross the legs. It is frequently bruised, such an injury being commonly known as a "charley horse."

Semitendinosus Muscle, the "Track Muscle"—has its upper attachment at the ischium and the lower at the inner part of the head of the tibia. This is the muscle which is so frequently "pulled" by trackmen. (muscle) leg

External Genitals—subject to contusion, venereal infections, hydrocele, etc.

KNEE

Patella—a sesamoid bone subject to fracture, dislocation and abnormal "wobbliness."

Semilunar Cartilages—line the lower articular surface of the knee joint. A fragment of these cartilages chipped off by violence is the cause of "floating cartilage of the knee," a very troublesome injury. The semilunar cartilages are occasionally dislocated.

Bursae—are membranous sacs containing lubricating fluid aiming to lessen friction wherever there is motility, chiefly round about joints. They are located beneath neighboring muscles and tendons. An inflammation of these bursae, due to a wrench, blow or infection, is called "bursitis," and is characterized by a localized swelling. In athletics most common at elbow and knee.

Synovial Membrane—lines articular surfaces of all joints. It exudes a lubricating fluid. If inflamed, due to injury of joint either by violence or infection, this fluid is poured out in great excess and we have "synovitis," or "water on the knee."

Internal and External Lateral Ligaments of the Knee—in severe wrenches or sprains of the joint these ligaments may partially or completely rupture and in healing become lengthened, causing weak or "wobbly" knees. Some of these cases can be exercised back to normal and some are hopeless.

LEG

Shin Bone (Tibia)—the fact that it is exposed and that injuries of bones are very painful and disabling, justifies extreme precaution in providing protection for it. Ulcers which are very slow in healing, because the blood supply to the part is poor, frequently form along the course of the bone.

Internal Malleolus—is the bony process at the lower part of the tibia which can be felt under the skin, on the inside of the foot just above the ankle joint.

External Malleolus—is a similar process on the lower part of the fibula which can be felt on the outside of the foot above the ankle joint.

Peroneous Longus Tendon—is situated in the groove just back of the external malleolus and is occasionally dislocated on to the surface of the malleolus.

Tibialis Posticus Tendon—lies in the groove just back of the internal malleolus and may be displaced on the malleolus.

Extensor Muscle (Extensor Communis Digitorum)—runs almost parallel with the shin bone. This muscle when overworked causes the condition known as "shin splints."

Ankle Joint—is subject to sprains, fractures, and dislocations.

Arches of Ankle—may weaken, resulting in "flat foot." A great number of athletes are bothered with this complaint. Sprains of the ankle predispose to "flat foot."

Heel of Foot—is subject to "stone bruise."

Tendon of Achilles—is attached to the *os calcis*, the bone forming the back of the foot. It is subject to sprains, rupture, and painful swellings. Flat arches throw an additional strain on this tendon, causing pains in the calf.

Gastrocnemius—is the larger muscle of the calf of the leg. It usually gets stiff and sore at the beginning of training. This muscle may also be "pulled."

BACK

Muscles of the Small of the Back—are subject to sprains of varying severity.

The Spinal Column—it is important to remember that the spine contains the spinal cord, a vital part of the bodily nervous system. Since the nerves control the functions of the body, it follows that by stimulating the spinal region we can indirectly stimulate the whole body. This is of importance in massage.

Second Wind

As every athlete well knows there is a period of time following the start of strenuous physical exertions when he is literally suffocating. What's happening?

Our respiration is under the control of a nerve "centre" located in the medulla. This center is activated by the amount of carbon dioxide in the blood. Thus an increase of carbon dioxide will stimulate the centre and yield an increased respiration rate. When for any reason the concentration of the gas (CO_2) in the blood falls below the threshold necessary to activate the centre, respiration stops altogether.

Suppose you are driving along in the first part of a quarter-mile run. The activity is producing a great concentration of carbon dioxide in the blood. The respiratory centre is stimulated and the respiration rate rises rapidly. The increased aeration washes out the CO_2 so that a condition is suddenly created whereby there is less CO_2 in the blood than it takes to activate the centre and respiration stops. This is the moment of suffocation.

At the same time the blood circulation has not yet adjusted itself to the increased demands and as a result there is a concentration of waste products (lactic acid, etc.) in the muscles, the toxins causing a condition of rigor, the muscles being tense, hard, unworkable, "tied-up." The muscles of the chest and arm bind like a tight armor, further preventing respiration. But the silver lining is just around the corner.

The momentary cessation of respiration means that no CO_2 is being eliminated and the gas therefore quickly accumulates to a concentration sufficient to stimulate the "centre" and—you've got your "second wind."

At the same time the circulation has adjusted itself, the waste products are flushed out of the muscles, the rigor disappears, and the whole body is co-ordinating smoothly in carrying through the physical effort.

No manner or amount of training can eliminate wholly this phenomenon of "second wind." But one of the chief objects of training and "warming-up" is to shorten the duration and lessen the acuity of the respiratory and muscular distress—in other words, to get the "second wind" quickly and easily.

THE CIRCULATION IN EXERCISE

The heart is the pump which drives the blood through the body, supplying nourishment, removing waste. Its rate of contraction is controlled by a nerve "centre" located in the medulla (stem of the brain). This centre is sensitized by the amount of CO_2 in the blood.

Now suppose you have begun to exercise. Energy is needed. In the muscles is stored a certain amount of glycogen which, when oxidized, yields: some lactic acid, CO_2 , water, and energy. The greater the activity the more oxidation and the greater the concentration of CO_2 which is taken up by the blood from the tissues. This CO_2 laden blood, in its course through the body, reaches the heart-controlling centre. The inhibitory control is lowered and the heart rate is accelerated. This means that the same quantity of blood (since we only have a given quantity in our body) will be hustled through the lungs for aeration and then through the whole body at a gradually increasing rate, a rate commensurate with the immediate needs.

SURPLUS ENERGY

We can not only generate energy, but also store it. This is of great import in athletics. A contest calls for a great expenditure of energy. Conditioning and training plans must take this into account. Lengthy drills may teach your men a world of football or basketball, but if they sap the surplus energy of the boys then all your well laid plans are apt to go wrong. Nerve alone will carry a team to victory only occasionally—that is why we make such a fuss over these occasions. You must aim to send your team into a battle well rested, full of pep, thrilling with reserve vitality. Care in apportioning training, due attention to the diet, plenty of sleep, dodging of worry, and that very important rest day before a contest will assure you a peppy team.

In scrimmages drive your men at contest speed, but shorten the period. Don't continue to point of exhaustion. When a team reaches that point in a contest, "nerve" will help them carry on. But in practice the incentive is lacking, the exhausted man slows down, is less alert and agile and is very prone to be injured. Stop the scrimmage at a point where the men are still anxious to keep it up. The surplus power they thus conserve will come in mighty handy on Saturday. Don't drain the man to the utmost every day.

In track, avoid too many time trials—the fewer the better and not too close to a contest. If you do hold them, give the men a few days of lighter work to regain the exhausted energy. A time trial drains fully as much as an actual contest. Don't run a man his full distance too frequently, for the same reason. To run his full distance at approximately his best time he must expend every bit of energy in him.

SLEEP

Plenty of sound sleep is indispensable to the athlete. He goes to bed tired physically and mentally, energies at a low ebb. Throughout the night the body is resting. The blood flows along washing out the waste products, storing up a new supply of the energy yielding glycogen in the muscles. The eliminative organs are taking up the bodily waste from the blood, concentrating it for evacuation in the morning—a youth rejuvenated in vigor rises to his tasks in the morning.

An athlete needs eight to ten hours of sleep and no objection to more. High school boys need more sleep than the more mature college men. Quiet, cool rooms with comfortable bedding are essential. A small, fairly hard pillow is preferable to large, soft ones, which heat the head, cause a congestion of blood in the brain, netting restlessness. "Soft, thick pillows for soft, thick heads." Sleeping on the right side with the right knee drawn up is a good habit to get into. This position removes all pressure from the external genitals and thus serves to prevent "wet" dreams. Avoid mouth breathing by placing a narrow strip of adhesive over the lips. Mouth breathing causes snoring, nasty taste in the mouth on arising, etc.

Sleeplessness may be due to hyper-excitability preceding or following a game; staleness with its trail of symptoms; overwork, quite often an athlete is "too tired to sleep"; worry, over scholastic difficulties, coach's attitude, etc.; noisy surroundings—frat brothers are not always considerate; etc. The remedy is clear in the last mentioned instant; for sleeplessness due to nervous tension, go to bed, relax, read a magazine, choose an essay rather than a story. In persistent cases, a warm bath at temperature of the body (tepid, duration 20-30 minutes) soothes and is almost sure to prove effective. No weakening after effects need be feared. A cold shower in the morning will pep the man up.

On trips, assign the lower and more centrally located berths of Pullman to your regulars. Keep ever in mind that few people sleep well on trains. This is especially true of highly strung athletes. If you have a road trip allow yourself an extra day, so your men will be assured of a good night's sleep the night preceding the contest. Choose quiet hotels in residential sections rather than noisy, centrally located ones. Some of your men will find difficulty in sleeping in strange beds. Have separate beds whenever possible. Choose airy, inviting rooms. Don't let the hotel clerk palm anything off on you. The comfort of your boys is vital to your success.

A nap some hours before the game rests and also serves to delay onset of pre-game excitability.

Relaxation—Teach the boys how to relax completely. Stretch out on a comfortable surface, legs uncrossed, head comfortable, shut your eyes, relax every muscle in your body, and try not to think of anything at all, or if you must think, think of the shape of leaves. Five to ten minutes of such absolute relaxation works wonders. Any physical director who handles numerous classes will find this relaxation stunt a life-saver.

Football men should so relax when on the rubbing table, and between halves of a game for however short a period; basketball men between halves; track men between heats or events, etc.

WARMING-UP

Back of "warming up" lies sound physiology.

A voluntary muscle is composed of fibers. These fibers are bundles of tiny fibrils. Each fibril and then each fiber is ensheathed in connective tissue, the whole not unlike an insulated cable.

The nerve controlling the muscle enters it, then frays out into a closely woven "end-plate" a sort of a switch-board. From this plate tiny branches run to the fibrils—to most, but not to all. Some of the fibrils receive their stimuli by conduction through the connective tissue sheaths from the fibrils which do receive nerve endings.

The nerve fiber is merely a conducting wire. The stimulus to the muscle may have a conscious or reflex origin. The leap of the sprinter from his mark with the bark of the gun is a conscious effort, instigated by the will. The stimulus comes from the highest centers of the brain.

On the other hand the long distance runner who has hit his stride, can be thinking of last week's prom, yet hold his rhythmic stride. Here consciousness is not the activating agent. Such movements, not requiring conscious control, are reflex in character. The impulse originates in a specialized "end-organ" located somewhere near the surface of the body; it flashes to the corresponding segment of the spinal cord, then stimulates the motor nerve fibers controlling the muscles which must contract to net the essential movement.

The importance of all this to the athlete is that conscious activity is far more fatiguing than reflex. Thus constant change of pace in a race increases degree of fatigue and consequently lessens chances of victory. Similarly games calling for great variation of movements will cause greater and more persisting fatigue.

Incidentally it is well to remember that fatigue may be of two types: neural or physical. Prolonged strenuous physical exertions not necessitating much conscious control will yield true physical fatigue which is due to the accumulation in the muscles of oxidation products, such as lactic acid. This type of fatigue can be relieved with massage, hot baths, rest. Neural fatigue is due to a prolonged flow of stimuli to various nerve centers which gradually wears them out so they are unable to respond with the customary

"snap." And of course if the nerve control drags so do the muscles which it activates.

Now in athletics, wherever conscious movements predominate, you are going to have more neural fatigue than physical. It is safe to say that most athletic fatigue is chiefly neural in character. A trained body can stand a lot of physical wear and tear, but only a limited degree of neural. And it is when the latter begins to weaken that your man begins to fumble, miss tackles, forgets to cover, etc. There is only one treatment for neural fatigue and that is rest, a change of scenery. Accumulated effects of neural fatigue quickly lead to staleness.

In this respect it is interesting to note the effect of victory or defeat on a team which has just gone through a strenuous contest. An athlete is hardly conscious of fatigue in the exhilaration of a victory which acts as a stimulant to a worn-out nervous system; whilst a defeat accentuates fatigue because of the incidental mental depression.

Now to get back to the muscle. Suppose a stimulus originating in consciousness or reflexly streams down to the muscle. The latter contracts. But not all the fibrils will contract because not all receive the direct orders. Those fibrils receiving the stimulus by conduction from their neighbors will lag behind. Thus when you begin to use the muscle you haven't the whole muscle working for you. Gradual "warming-up" soon puts the whole muscle "whole-heartedly" at your service.

When a muscle is at rest it receives a normal blood supply, which takes care of the nourishment and the cleansing of waste products of the muscle. Additional work or energy expenditure means the necessity of an increased blood supply, which is effected by an increase in the rapidity of flow, so that more blood enters the muscle in a given time. The products of oxidation incidental to the muscle activity must be removed quickly and in large quantity or the lactic acid which is one of the products, will accumulate, causing fatigue, soreness and stiffness. At the same time vigorous activity will call for a great increase in the blood supply to the muscles involved, more nourishment for the production of energy and more oxygen being indispensable. It stands to reason that such a profound readjustment of bodily function cannot be

expected to materialize in an instant. Therefore, another vital aim of "warming-up" is the adjustment of the blood circulation.

Then there is the heart. While not directly involved in the muscular activity the effect of sudden unprepared-for demands on this blood pump is apt to prove detrimental. An athlete is "burned-out" or "killed," or is forced to nurse heart dilation or heart enlargement because of failure to treat a delicate piece of machinery with due consideration. The heart must be gradually "warmed-up" to the enormous task of carrying a man through an extreme athletic effort.

The factor of respiration is another vital one. I have discussed the mechanics of "second wind" and have pointed out the importance of lessening the period and the acuity of the respiratory distress incidental to the increased activity, by means of progressive training and "warming-up."

Finally we have a most important factor, that of antagonistic arrangement of the muscles of the body. "Pulled tendon," some erroneously call it "charley-horse," may occur in various parts of the limbs, but is most common on the upper part of the back of the thigh just below the curve of the buttocks. Many a sprinter rues the day when through carelessness he failed to warm up sufficiently, called on his muscles suddenly, something snapped and he tumbled on the track as if shot, with the prospect of months of disability and perhaps permanent loss of athletic activity. He may regain his form. He may even equal his previous performances, but at any instant the weakened part may snap again.

If you have a good man guard against "pulled tendon" more than any other athletic injury. And the best guard is thorough "warming-up," loosening, shaking, massage, and protection against chilliness with oily hot-stuff, goose-grease, and flannels.

To get back to the cause. The muscles of the body are arranged in antagonistic sets. Thus the flexors work against the extensors and vice versa. But the body has wisely provided for co-ordination between these antagonists, by means of a specific neural supply. Thus suppose you want to flex the lower limb at the knee. The extensor muscles on the front of the thigh keep the knee in extension. It is clear that if the flexors on the back of the thigh are to achieve their purpose of flexing the knee, the extensors must let go. And that is exactly what happens. The stim-

ulus which travels to the flexors to activate them to contract also travels down a special set of nerve fibers to the extensors, causing the latter to relax.

In normal daily activity this co-ordinative action runs along at a certain rate. Suppose now an athlete decides to let loose at top speed without preliminary "warming-up." The knee is flexed. The extensors may not relax, but instead develop tension aiming to straighten the leg. As the movement progresses the runner snaps the leg forward. What will happen now will depend on whether the flexors were ready to let go evenly, which is the case when the muscles have been thoroughly warmed-up to this particular form of movement. If they were not, then in flinging the leg forward you put an enormous strain on a tensed chain which may snap at its weakest link which is at the tendon attachment or at the narrowest or thinnest part of the tendon.

In summary: warm-up to prepare the muscles, the heart, the circulation, and the respiration for the coming effort and to prevent "pulled tendon."

MENTAL CONDITION

The mental condition of the individual members or the whole squad is a vital factor in the success of the team. It can make or break. "Confidence," but not too much of it; "Edge," but not to the breaking point; "Visualization" of the coming contest, to realization and decision, but not to the point of worry and fear; these and many other factors that come to mind go to form the very important psychological phase of athletic training.

The problem as to just when, how, and to what extent to "key-up" a team, is undoubtedly as important as the imbuing of the fundamentals. The more experienced the coach, the more intent he is to so arrange his schedule as to enable him to "key-up" his team bit by bit, reaching the pinnacle as they face the big game of the year. Alumni, "policy," "good-will," intersectional rivalry, etc., frequently force a coach to schedule a game which necessitates mid-seasonal "keying-up" to knife-edge keenness. What's the result? Centre beats Harvard, giving a finished demonstration of offensive and defensive football and the very next Saturday makes a miserable showing against Georgia Tech. Gil Dobie of Cornell, one of our most successful coaches, persistently ignores

"popular clamor" and his playing schedule is a model for every coach to follow.

"Keying-up" is the placing of athletes under a given mental tension. Prolonged—it is debilitating. Avoid keeping a team on edge too long. Bob Zuppke while on a trip with his team will tell stories and listen to stories that have little to do with football but help to wile away the draggy hours and delay the onset of nervousness. At the dinner table he is a genial host, just one of the boys. But see him in the training quarters just before the game. His whole demeanor is changed. The face is sombre, serious, the jaw is set, he paces the floor with restless energy—a bundle of springs. Zup is "keyed-up." And every one in the training quarters begins to feel "shivery." It is contagious. The players are grim. There is no laughter. They are getting ready. All the talk is of football. The edge is there. The boys run out on the field for a few minutes of "warming up." They return. And then comes the last talk. I suppose a man must be a natural leader of men to be able to inspire them with the will to do or die. Certainly a vigorous personality, an easy flow of clean, vigorous words, and conviction which comes only with whole-hearted belief in the cause, are vital essentials. What to say, when to say, how much to say, and how to say it, is more a matter of intelligence.

Slight incidents often net profound consequences. The athletic game is full of little things that mean much. Your forward in basketball permits himself to be irritated by his opponent's close guarding, pays more attention to "showing up" the guard than to the team work, and the whole combination is weakened. Your linemen lack confidence in a given back and fail to give him whole-hearted assistance, etc. In this connection here is an actual occurrence that will serve as an illustration.

A team of only fair ability is "keyed-up" by a dynamic coach and springs a surprise by beating a much better eleven. Realizing the possibility of an anti-climax, the coach by sheer force of personality and a thorough grasp of handling athletes manages to send out a team the following Saturday which to all appearances is alert—"on its toes." The opponents have a very poor seasonal record. The two teams are traditional rivals and it is far more vital to win this game than the preceding one.

The team is on the field running through signals. The opponents are still in the training quarters closeted with their coach. The minutes pass. The officials are tearing around, sending messengers, demanding that the opponents come right out. They are coming—the officials are assured. But they do not seem to be in any hurry. Meanwhile the men on the field have hustled through their signals, have their helmets on and are ready to rush out on the field of play. Minutes pass. The men on the field are restless, their nervous tension close to the breaking point. Their coach is raving mad. The officials threaten punishment. Some more draggy minutes pass. And now if you are an experienced man in the handling of athletes you can recognize the change in the men on the field. The tension has snapped. Some show signs of listlessness, some are ashiver with extreme nervousness, but the alertness, the eagerness for the fray is replaced by anger and dissatisfaction—poor substitutes. Here come the opponents. Their coach is full of apologies. But the damage is done. A "broken team" faces them, to get the only possible result—a licking.

Just how much a man will give you will depend on his attitude towards you, the game, or school spirit, and his condition. Thus your personality may keep him playing hard for you. Or he may care little for you but love the thrill of the game. Again his love of applause may cause him to put forth his best efforts. And finally his condition. If he feels "right," full of pep, he'll come through because his abundant vitality thus finds a natural outlet.

Riding a Player—It is an error to assume that since football and basketball are driving games, a coach is justified in using the same method towards all men. It is interesting to note that where coaches of basketball or football have remained with schools for a more or less lengthy period it was because they intelligently interpreted this phase, namely: that to get the best out of men you cannot use the same method toward all. This past season a number of well-known successful coaches were let loose by schools with the one complaint—"unjudicial driving." Some men can be driven pitilessly, some to a degree, and some not at all. A kick in the butt may go far with a rough lineman, but a string of rather forceful panning to a highly strung open field runner may send him

home nervous, depressed, worrying, unable to sleep, and when he reaches the field the next day he is far less capable to do his best. The coach hands out a more emphatic panning—and in a very short time the boy is either stale or on the scrubs, and there, wonder of wonders, he is the same good player again, and the coach wonders what it is all about.

Let me cite a specific instance. A little half-back with a fine previous season's record is being "ridden" by the coach. As I watch from day to day I can see the signs that mean trouble. The kid is not taking the panning "right." He is worried. He tries but somehow nothing goes right. From a trainer's viewpoint I can see the kid is hustling at top speed toward failure. The coach is worried because he had put a lot of faith on the kid coming through. The team-mates are also worried because they counted on the kid. Finally, one afternoon comes the order relegating the star to the scrubs.

That night I was in the kid's room. "What's wrong, boy?" The coach can drive, but the trainer nurses. "Why, Doc, I can't stand the driving. It seems to me he is watching me all the time. If he only forgot me for a while. . . ." That wasn't so hard to grasp. The next morning I saw the coach, who is no bull-headed driver, but an exceptionally intelligent handler of boys. The coach frankly admitted he erred in this case. That afternoon the kid was ordered back on the first team. The coach swung around to the opposite end of the line and throughout the afternoon kept far away from the youngster. Did the boy come back? Did he! He was a brilliant performer that year, the following year and still is the most versatile professional football player in the West. In a game the very devil, fearless, working like a wild-man, giving his best wholeheartedly (twice in one season I have carted him away in a taxi completely exhausted) and yet he couldn't stand "riding."

There are many more like him. And when the coach realizes the vital truth of this fact and will study his men with a view of handling them accordingly, he will take one long step towards making a name for himself and a permanent place with the school and in the hearts of the boys he comes in contact with.

I have scratched the surface of athletic psychology just enough to bring out the importance of it, whether in training or conditioning. Far be it from me to attempt to tackle the subject fully.

Physical Examination

The importance of physical examination of candidates for athletic teams is indisputable. In most schools there is a medical adviser who passes on the fitness of the boys. Still there is no harm and mayhap some good in trainers and coaches having a fair grasp of the routine of physical examination. The outline submitted is specifically for the examination of athletes primarily with a view of admitting them to competitive sports and secondarily as a check on the condition of the men in training. For thorough study of the subject Cabot's "Physical Diagnosis" is without a peer.

GENERAL APPEARANCE:

- A. Healthy? Vigorous?
 - B. Type of Physique? Height. Weight Muscular Development. Type of Musculature? (long slender, or short bulky). Posture. Carriage.
 - C. Skin—Color? Cyanotic (blue) indicates anemia, poor blood or not enough of it.
Yellowish tinge—suggests a torpid digestive apparatus.
- Eruptions? Scars? Operation marks?

HEAD:

- A. Eyes—acuteness of vision is easily tested with special eye charts. Poor eyesight may be the cause of the persistent fumbling or sudden failure of your best "shot" to hit the basket.
- B. Ears—Conversing with a man gives you a line on his hearing acuity. Test for "hard of hearing": hold a watch close to patient's ear (closing the other), slowly move watch laterally in a horizontal line at level of ear. A point is reached where patient just fails to hear the "tick." Mark the distance from the ear. Repeat procedure with other ear. By hav-

ing a clear idea of the normal limit you can thus easily determine the acuity of hearing of any case.

C. **Nose**—Test for obstruction of nostrils. Close mouth and one nostril and breathe through open nostril.

D. **Teeth**—Condition? Pyorrhea?

E. **Tongue**—Coating? If slight, ignore.

F. **Tonsils**—Enlarged? Inflamed? Infected? Removed?

CHEST:

General appearance—Deformities (funnel or pigeon-shaped—malformations are not always signs of ill health).

Expansion—measurement.

Regional Limitation of Expansion—ask patient to breathe deeply—note whether expansion is uniform. Limitation of expansion on areas of chest suggests lung, heart or muscular trouble.

Respiration Rate—Take number for one minute by watching heaving chest. Normal—16 to 20 per minute.

HEART:

All the trainer can aim for is to be able to recognize the normal heart and detect an abnormality. To properly diagnose heart ailments is a task that balks even the most experienced medical practitioners.

Be able to

A. **Locate the Apex Beat**—it is normally in the 5th costal (rib) interspace, about $3\frac{1}{2}$ inches to the right of the mid-line of the sternum.

You may locate it by—

I. **Inspection**—seeing the beat. Easy in "skinny" people. Impossible in stout.

II. **Palpation**—feeling for the beat with the flat of the hand pressed against the area of the apex. The impact of the beat is felt by the hand. Best method of locating beat.

III. **Auscultation**—listening:

A. **Immediate**—by placing your ear over the approximate location of the apex.

B. **Mediate**—with stethoscope. (Get a bell stethoscope for about \$2.00. You'll get a lot of sport out of it, even if you haven't the chance to make use of it professionally.)

Importance of Apex Beat—if it is considerably displaced from its normal position—there is probably an abnormality—refer to medical adviser.

B. Determine the Heart Sounds.

- The heart contracts to expel its contents into the arteries—this gives us the first sound "lub."
- There is a barely perceptible pause.
- The valves of the Aorta and Pulmonary artery snap closed—netting the second sound "dup."
- A slightly longer pause while the heart rests and fills with blood.
- The cycle is repeated, rhythmically, at an average rate of 72 cycles per minute.

Practice immediate and mediate auscultation in order to KNOW the normal sound and the normal rhythm. When you can tell "lub-dup," any other kind of a sound or rhythm means "refer to physician." Auscultate the whole heart area, not merely the apex.

If in doubt instruct patient to run in place for a few minutes. If there are abnormal sounds the increased heart beat will accentuate them.

Murmurs—are the commonest abnormal sounds heard. Blow over the mouth of an open bottle and you'll know the typical murmur sound (swishing).

C. Take the Pulse:

Place the tips of the three middle fingers on the lower part of the radial artery, found on the thumb side of the forearm. Compress the artery just enough to feel the impact of the pulse. Record number of pulsations per 30 seconds. Multiply by two to get rate per minute. Normal rate ranges from 55 to 80.

Also note—

1. **Rhythmicity**—irregularity in rhythm indicates abnormality.
2. **Strength or "size"** of pulse—a weak pulse indicates abnormality.

D. Take the Temperature:

Place thermometer under tongue for two minutes or over. Be sure to shake thermometer down before using. Normal temperature 98.6°.

ABDOMEN:

Degree of development of muscles of abdominal wall? Vital for good health. Flabbiness usually means torpid functioning of digestive apparatus.

Any abnormalities? Operation marks?

Hernias? Place tip of finger in hollow of crotch just to inner side of thigh. Ask patient to cough. The hernia which appears as a bulging becomes more palpable on coughing. The bulging may be clearly seen.

BACK:

Curvatures of Spine?

- A. **Scoliosis**—a lateral (side to side) curvature. Most commonly due to weak ligaments and muscles.
- B. **Kyphosis**—a backward curvature; whole spine is arched backwards.
- C. **Lordosis**—an increased anterior curvature of the lumbar region of the spine.

Extremities:

Any deformities? Joint disabilities? Varicose veins? Flat feet? Hammer toe? Corns? Bunions

Genitals (external)

Ulcerations? Scars? Discharges? Varicocele? Hydrocele?

CHAPTER III

CONDITIONING

All other things being equal the success of a team is directly dependent upon the physical power and mental alertness of its personnel. All branches of competitive sport make a tremendous demand upon the muscular strength, endurance, vitality, and the mental powers of the participants. Only a man in the finest of condition can stand the wear and tear of a football season. Men out of condition are negative assets to a team—they serve as temporary obstacles to the successful development of the team until the law of the survival of the fittest enters in—and the weaklings fall by the wayside.

In most colleges and schools pre-seasonal conditioning is completely ignored. The coach rarely concerns himself with the condition of the athlete until the latter reports at the beginning of the playing season. The athlete, who is after all but a full grown "kid", often does everything possible to nullify the beneficial effects of the preceding season's training. He indulges in various forms of dissipation—overeating, smoking to excess, drinking "vile beverages," keeping late hours, finally reporting to the coach an athlete by reputation and record only. Stifling anger and despair the coach accepts the inevitable and proceeds to build his team, the conditioning becoming a mere incidental to the general training routine. It is no exaggeration to say that many teams never do get into condition. At the same time this lack of conditioning serves as a drag, making impossible the rapid development of the playing machine. It is apparent that the time and the effort spent in removing this drag will be more than repaid by the increased effectiveness of the team.

But in order properly to condition a team, time is essential. Rome, they say, was not built in a day, nor can any power, mental or physical, of any consequence be developed in a short space of time. Certain it is that enduring health, strength, and stamina cannot be gained in a short strenuous (oft too strenuous) training season. It takes time.

The argument is frequently heard that athletes will not do pre-seasonal training. But this implies that they lack faith in its efficiency. If such be the case, then the fault lies with the trainer who has failed to convince the athlete of the value of conditioning, rather than with the athlete himself. For admittedly, the average college youth is reasonable, and if convinced of the worthiness of a rule, will not only abide by it, but will help to persuade his weaker-willed brethren. The point is that the trainer cannot achieve results in the matter of conditioning by issuing orders. Regulation of one's life habits can come only as a result of conviction and rarely through force of authority. For in all of us there is an inherent instinct to live life our own and not someone else's way, unless, I repeat, we recognize the "someone else's way" as superior to our own. Nor can the trainer use the coach's method of demanding compliance with his regulations. The coach can observe and criticize what a man does on the field, and compel him to obey orders, but what the man will do away from under the coach's supervision depends entirely upon **his own** view of the matter. A dyspeptic can be dieted in a sanitarium, but whether he follows his diet after he leaves, depends entirely on whether he has been convinced that the diet will be of benefit to him.

My policy has been to talk things over with the men, suggest certain routines of training, and do my utmost to convince the men of the efficacy and value of these suggestions. I welcome criticism, for I know that being right, I am bound to win my point. The chief force of my argument lies in the fact that year-around systematic training benefits the individual fully as much, if not more than it does the school. For to him it means health—abundant, vigorous, exhilarating health—an insurance against disease—an assurance of happiness and true enjoyment of life. And "Maintaining health is like maintaining morality. It requires continuous virtuous conduct, not spasmodic or periodic efforts, in the right direction." Finally when the young man comes to see my point of view and realizes the intrinsic value of training, then the latter is bound to become a habit with him—an indispensable life habit, truly beneficial to him in all the years to come. When the athlete promises to follow my suggestions, I know he does so because he is **convinced** that they will prove helpful to him.

forts expended in gaining and conserving health are amply repaid

And it is in this phase of athletic training—conditioning, that the trainer's resourcefulness and a knowledge of the principles of physical education, anatomy and physiology are of primary importance. No general rules or methods are effective. To a limited extent group work is possible, but in order to obtain the most benefit each man must be examined and treated individually. Pressed for time I would resort to class work, but at all other times I would give preference to individual treatment. Special treatments must be prescribed for special cases, and a little experience will prove to one that all cases are special cases. Each man is a case in himself. As a rule the conditioning exercises should simulate, as far as possible, the movements common to the specific game in which the individual will try to gain fame.

FOOTBALL

Pre-seasonal conditioning is practically indispensable. The coach's time is limited, and every day taken in order to bring the men into condition means so much less time left for the teaching of the rudiments and complexities of the game itself. To build a smooth-running, finished, powerful team, time is essential and the season is all too short. Consequently the trainer who is able to give the coach a team well conditioned and ready for the hardest kind of work, is indeed a man whose services are invaluable.

Immediately after the close of the season call a meeting of the left-over varsity men and the freshmen squad. The meeting may be opened by the coach with a talk on the importance to the chances of the team of reporting in good condition at the opening of the following season. He may emphasize the fact that the men who will not take time to get in condition, may have to take time to be out of condition, i.e., go stale or be laid out with some injury (in the greatest majority of cases it is the poorly conditioned man who gets injured), and that their chances of making the team are bettered or lessened by their physical condition. And finally he may appeal to their sense of loyalty to himself and their love of their Alma Mater.

The basis of the trainer's talk will have to be "The intrinsic value of health." You must endeavor to prove that true exhilarating health is far superior to mere "getting along;" that all efforts expended in gaining and conserving health are amply repaid

by the returns in happiness and enjoyment of life and freedom from disease. Challenge the men to answer whether they prefer to be flabby-muscled, sickly, dissipated-looking mollycoddles, or strong, vigorous, clean-cut men. Having made your point, you may next explain your theories of dietetics, taking due care to prove statements which you have reason to suspect may be doubted. Emphasize the fact that dieting does not mean partial starvation, but merely the application of common-sense in choosing the quantity and the quality of one's food. Harp on simplicity and moderation in diet. Proceed with your suggestions regarding exercise. Prove that it is only daily systematic exercise that makes possible the development of physical power and the accumulation of vitality and endurance—and that exercise in "spurts and spasms" has no value whatsoever. Demonstrate four or five two-count exercises which call for vigorous body bending. Walter Camp has a world of faith in his favorite "daily dozen." You can probably think of a series just as effective. Point out that five to ten minutes a day will keep fat and ill health away. Stimulate interest and advise participation in other sports.

Next make appointments with each one of the prospective candidates for next fall's team. Thoroughly examine them, paying particular attention to defects or ailments. Talk things over. Establish pleasant relations with the men, for as I have stated above, friendly persuasion is more effective than a superior's compulsion. The trainer will attain better results if the boys are all with him and for him. Again impress upon the individual the value of year-around training. Especially should the members of the freshmen varsity be examined for special cases of injuries disregarded during the excitement of the preceding playing season. Either prescribe treatment for these injuries, or, if they are serious, refer the men to a medical adviser, so that these defects may be corrected. Also note the degree of physical development and the parts under-developed. Assign special exercises with the view of developing the latter and aiding the youth to attain a powerful, vigorous, symmetrical physique. Pulley weights, Swedish stall bars, heavy dumb bells, and special setting-up exercises, are all efficient means for this purpose. Football candidates should be advised not to participate in swimming or tank games (water basketball, etc.). Swimming tends to soften the skin and muscles, and deposit fat in thick

layers; the lengthy soaking in sweet or salt water drains the vitality and strength and robs the youth of his natural speed. Football and swimming are no mates. Participation in other sports, especially basketball, should be encouraged, since the latter game teaches the men to be quick, agile, and alert. All of these qualities are of vital importance in football, or for that matter in any team sport. Moreover, the competition in other sports helps the youth to gain that confidence and coolness under stress which so greatly add to an athlete's value.

During the rest of the year manage to keep tab on the boys to make sure that your instructions are being followed out with diligence. There will be shirkers—there always are in all walks of life. A few carefully chosen words may help bring the straying sheep back to the fold. A student assistant working a few hours a day would greatly aid the trainer in keeping tab on the men and incidentally on their scholastic standing.

Another method of reminding them of their duties would be to issue monthly bulletins treating of the various phases and means of conditioning. Twice during the school year the men should be re-examined and their condition noted. Whatever you do—be persistent but with diplomacy. Some men will balk, and be rather hard to handle, but keep after them—sooner or later they are bound to see that you are right, and you will win your point.

When vacation time comes, the question of conditioning rests entirely upon the earnestness and conscientiousness of the athlete. If he is the right sort and is loyal to his coach and his Alma Mater, and if you have convinced him of the value of conditioning, then he will come back fit and trim. If he is not—well, then you are simply not dealing with a man.

Before the departure of the men obtain their addresses, and as the summer progresses drop them occasional "reminders." Finally, about three weeks before the opening of the season, write them calling for increased activity—running, sprinting, hard exercise, in short, that they bend all efforts to report in the best of condition. But warn against extremes. Some men will be so anxious to make a good showing that they will report too "fine" and then you'll have a problem of keeping them from going stale when the strenuous workouts start.

BASKETBALL

Naturally enough the suggestions I made for the football men, can, to a large degree, be applied to basketball men as well, or, for that matter, to all athletes, for does not every coach want his men in the best of condition. However, consistent training should start in October. Attention should be paid to building up the men who need building up. The greater part of their training may include work with the basketball, such as throwing, shooting, practicing stop and turns, etc. In fact it is best that they do such work, for they will then develop skill simultaneously with agility, endurance and strength, all invaluable qualities in a basketball player. In rare cases are supplementary exercises indicated.

BASEBALL

Training starts early in the spring. Besides practice with the ball the men should spend fifteen to twenty minutes in setting-up exercises, or working with the pulley weights. The main object should be to develop the abdominal and back muscles. Weak arms, weak shoulder muscles, and weak ankles should be attended to. Those who lack "wind" should do plenty of running and sprinting. Teach men a few exercises useful in keeping arm and shoulder muscles in condition. Two or three minutes daily will assure strength and pliability of these muscles and prevent "glass-arms" which are generally due to misuse of unconditioned muscles.

TRACK

All around development of the men through systematic exercises kept up the year round, is indicated. Special emphasis should be laid on the development of the shoulder, arm, and abdominal muscles. The shoulder and arm muscles are the driving muscles and if well developed, will greatly aid the runner. Strength in these muscles is especially valuable to the pole vaulter though for different reasons. Weight men should work out with the pulleys and take part in light calisthenic classes so as to keep their muscles springy and pliant. Participation in all sports except swimming should be encouraged. As a general rule we see too many scrawny-looking track men. Their poor physical condition is a reflection on the ability of the trainer.

SWIMMING

The best conditioning exercise for swimming is swimming.

COACH OR TRAINER

Success in handling athletes and obtaining the right results depends to a great degree on the personality of the coach. He must be dynamic, vigorous, trim in body, alert physically and mentally. With few exceptions coaches are ex-athletes and thus start out with the right kind of physical equipment. To retain his strength, pep and agility he must keep up athletic activity. Don't permit yourself to get flabby, pot-bellied, mushy-faced and bleary-eyed. You can't expect your charges to pay much attention to you if your appearance belies your preachings.

CHAPTER IV

DIET IN ATHLETICS

"The object of regulating the diet in athletics is not only to furnish the material to supply the essential power, but also to put the machine in the best possible condition for developing as well as applying the power. In other words the man is to be subjected for a short time to intense muscular strain and considerable nervous effort. This he is to bear with a maximum of result and the minimum fatigue. For this he needs practical training on the one hand and proper diet on the other."

To attain the highest possible degree of efficiency the athlete must possess a vast storehouse of vim, vigor, vitality—whichever you prefer to call the kinetic power which drives his physical mechanism. This power is supplied by the food he eats. It follows that an athlete is no better, physiologically (I may add, mentally, too) than his diet.

The intelligent planning of a dietary for the training season presupposes a clear comprehension of the principles of physiology of nutrition. The trainer should make a thorough study of the subject in any text on Physiology of late issue.

Briefly the physiology of nutrition may be summarized thus: We partake of food in order to provide energy for the carrying on of the various bodily functions; in order to generate heat to keep the body temperature up to normal; and in order to provide the material for the building or repair of the bodily tissues. Of the five general classes into which food is subdivided, proteins, minerals, and water, are pre-eminently tissue builders; carbohydrates (sugar and starches) on oxidation in the body liberate energy and heat as a by-product; and fats generate heat. Both carbohydrates and fats when present in excess are partially converted into adipose (fatty) tissue and thus stored in the body. Proteins cannot be stored. In determining a dietary the above facts are of primary importance. Some of the other factors which must be taken into consideration are:

1. **Age**—In athletes generally ranging between the years of 16-26, a period of growth and development, indicating the need of tissue-building foods in moderation. Nothing justifies gluttony.

2. **Season or Climate**—The amount of heat-producing foods (fats and sugar carbohydrates) must be regulated according to the time of the year and the locality—less when the temperature is high, more when it is low.

3. **Physical Development**—A 125-pound quarterback cannot, or if he can, should not, eat as much as the 190-pound lineman.

4. **Degree of Activity**—Is as a rule severe in training season, justifying an increased amount of nourishment.

5. **Idiosyncrasies**—"What is meat for one is poison for another." Each must learn from personal experience just the kind of food and the combinations that agree best with him. It is not sufficient to eat "good" food, it is necessary that the food be relished. Oatmeal and milk are popularly acclaimed as "perfect" food, yet we have all seen cases where either will cause gastric distress. The explanation? Idiosyncrasy, that is all.

An ideal diet in the training season would consist of a fair quantity of protein foods—lean meat, eggs, nuts, beans, whole wheat bread, etc.; carbohydrates (sugars and starches) forming the greater part of the meal; an amount of fatty food proportionate to the time of the year; and green vegetables and fruit in abundance, to supply: (1) The essential mineral substances; (2) the vitamins; (3) the coarse, fibrous material which by adding bulk to the contents of the intestines aids the peristaltic movement, thereby preventing constipation.

No definite quantity standard can be set. I am not in favor of apportioning foodstuffs by calories. The best quantity measure is plain common sense with **moderation** as the watchword. "God never made man's stomach for a slop tub." It is the athlete's duty to his coach and to his Alma Mater to practice self-restraint and to refrain from gluttony. At any rate the athlete who must be guarded from dissipation will not be of lasting value to the team. At some part of the race he will break down and fall by the wayside. The root of staleness is most often some form of dissipation.

It is a physiological fact that we neither digest nor assimilate all the food we eat. The body takes no more than it can utilize. A part of the surplus may be stored in the body as fatty tissue—a negligible part. The rest becomes a burden, fermenting, decomposing, putrifying, filling the body with poisonous substances which are taken up by the blood stream, and this sewer-like blood flows all over the body bent upon its mission of nourishing the bodily tissues. The result is inevitable—we have the inception of some of the numberless forms of disease. Especially is this true of the products of decomposition of proteins, nitrogenous compounds of an extremely poisonous character.

The body attacked by the poisons does its utmost to protect itself, and in its valiant efforts to rid itself of this putrefying surplus uses up much of its potential energy—an unjustifiable squandering of vitality. We must realize the fact that all bodily energy is but one, and that we have but a certain definite amount of it—our storage house of energy is not inexhaustible. Now every function of the body is carried on by means of this energy. It follows that if we squander this power on any one of these functions, the others will suffer in proportion. Vice-versa, the conservation of energy enables the athlete to be more efficient in the application of his efforts. Since economical nutrition saves bodily vitality, it is apparent that proper dieting is of inestimable value to the athlete.

An Athlete's Dietary Should Include:

Protein Foods—lean meat only; bar pork, bacon and like fatty meats. Fish, eggs.

Fats—butter, butterine, cream, ripe olives, olive oil, peanut oil, cotton-seed oil.

Cereals—All cooked or "breakfast foods" are good. Whole grain cereals should be preferred to those made of refined flour.

Legumes—beans, peas, lentils.

Starch Vegetables—potatoes, turnips, beets, carrots, squash, etc.

Green Vegetables—onions, radishes, lettuce, celery, etc.

Sweet Dried Fruit—figs, dates, raisins, prunes, etc.

Fresh, Canned, or Preserved Fruit—apples, peaches, apricots, pears, etc.

Fresh fruit should be just ripe. Under or over-ripe fruit is sure to cause digestive disorder. This is especially true of unripe bananas.

Bread—whole wheat, whole rye, corn, bran, or pumpernickel bread should be preferred to refined flour bakery products. Toast is excellent. While on trips we have always ordered toast for the athletes. Ban hot bread.

Beverages—postum, cocoa, milk, buttermilk, and cultured milk are to be preferred to coffee and tea. The latter, if used occasionally in small quantities, can do but little harm. There is no rhyme or reason in the popular belief that milk "cuts the wind."

Pastry—fruit preparations; rice or bread pudding; ice cream; whole wheat or oatmeal cookies. Cake and pie must be barred during the training season.

Water—The question as to whether drinking at mealtime is of benefit or harm to the individual has been a subject of debate for years. For a time those who claimed that it was harmful seemed to sway public opinion, but in late years the consensus of opinion is that water taken with meals aids digestion and absorption. It is claimed that the use of water with meals aids in gaining weight. The temperature of the water, however, should be normal—extremes should be avoided—and especially should large quantities of ice water be tabooed. The water should be taken slowly, in small quantities, and care must be taken not to wash down unmasticated food. Athletes, particularly those participating in sports producing profuse sweating, should drink all the water they crave and a little more. But when the man is all sweated up the water should be cool, not cold.

The use of figs, raisins, prunes, apples, spinach, and bran bread should be encouraged, since all of these are natural laxatives and aid in preventing constipation—the enemy of good health.

DIETETIC ABOMINATIONS

Spices and Condiments—Ketchup, sauces, pickles, vinegar, and pepper, all act as severe irritants to the stomach mucous membrane and are the chief cause of digestive disorders and possibly ulcers of the stomach. Moreover they interfere with the digestion of starches.

Fried Foods—"The changes occasioned in the fat by frying, develop in the stomach extremely irritating and injurious acids, which irritate the mucous membrane of the stomach, causing congestion and inflammation." **"There are foods which make muscle, foods that make blood, and foods that make fatty tissue. But fried food doesn't really make anything except perhaps a poor digestion."**

Fatty Meats—Glandular organs (liver, pancreas, kidneys, etc.) are all hard to digest, contain much half-decomposed poisonous substances, and have a very low nutritive value.

Fancy, Complicated, or too Highly Seasoned Dishes, are all abominable concoctions of little nutritive and much irritating quality.

Mush-like Foods are indigestible and constipating.

Foods of Extreme Temperatures—Hot soups, hot coffee, hot bread, ice water, all needlessly irritate the stomach, causing gastric distress.

Lunch Counter Sandwiches—"Hamburgers," "dogs," hot ham, etc., have a negligible nutritive value, yet the body is forced to work hard to attempt to get what it can out of such food.

Tea, Coffee, Alcohol, Tobacco—The objections to these are too well known to be repeated. Force of habit makes it hard to dispense with coffee, but we should strive at least to limit the quantity.

Overcooked Food—It is aptly said that the great majority of cooks of today have put mankind into two classes—those who have dyspepsia, and those who are going to have it.

Vile beverages, Confections, Pastry, Pie, etc.

There is no objection to chewing gum. It is more a question of aesthetics than of physiology.

SAMPLE MENU FOR TRAINING SEASON

Breakfast—Fruit—fresh, dried, cooked, or preserved; choice of cereal with chopped dates, raisins, or nuts; buttered toast, or graham muffins; cocoa, postum, or milk.

Luncheon—Soup, eggs, or fish, or meat, or macaroni or lentils, or beans or rice, or potatoes (the potatoes should be baked, browned, or cooked—never fried), green vegetables, desserts, beverage.

Dinner—Green salad, lean meat, potatoes, peas, carrots or lentils, bran or whole wheat bread, olives, dessert, beverage.

SAMPLE MEALS FOR BEFORE A CONTEST

1. A very small order of broiled chicken, ripe olives, one slice of toast, weak tea.
2. A very small portion of sirloin steak, toast, cocoa.
3. Two poached eggs, toast, cocoa, or weak tea.
4. Two soft boiled eggs, toast, weak tea.

If possible the men should have the choice of meat or eggs. Some athletes, I found, do not like eggs, and others feel the same toward meat.

When on trips care must be taken that the men do not overeat. Judging by their ravenous appetites one is moved to suspect that athletes fast a few days preceding a trip. The explanation no doubt lies in the better quality of food supplied them. Whatever the cause, the fact remains that given freedom the average athlete will "eat himself sick."

THERE ARE A NUMBER OF VITAL FACTORS WHICH AFFECT DIGESTION

1. **Variety**—To keep the appetite keen and to enjoy the food, a change in the menu is essential. Since it has been proved that keenness of appetite stimulates digestion, it follows that variety in food is a very vital factor.

2. **Regularity of Meal Hours**—Nothing should be eaten between meals. "Let us have a bite" between meals is sure to bring

harm to the athlete. Especially is eating late at night, just before retiring, injurious.

3. **Appetite**—Eating just because it is meal time is wrong. If one does not feel hungry, it is best to pass up a meal, and wait until hunger comes. The active athlete, however, does not lack an appetite. Eating some acid fruit, such as an orange or a lemon, will help to allay the sickly, gnawing sensation in the pit of the stomach which so many people mistake for appetite.

4. **Eating Just before or Right After Exercise**—Nothing should be eaten later than three hours before or until an hour after a strenuous workout or a contest. Exercise draws the blood away from the stomach, and if food be taken it will lie undigested and undergo fermentation. For the same reason no food should be taken when one is under severe mental strain—hurried, worried, exhausted, or “blue.” Before a contest athletes are generally on edge, and this state of mental agitation grows in volume as the hour of competition approaches. That is why the last meal before a contest should be very light. It is safe to say that even such a meal will not be completely digested, but it cannot cause so much discomfort as would a big meal.

5. **Environmental Effect**—Home cooking is always preferable because of the mental effect. Cleanliness, attractive appearance of food, pleasant surroundings and company act as psychic stimulants to the flow of gastric juice.

5. **Mastication**—“Your stomach has no teeth,” is an excellent saying to impress on the boys. Well-chewed food assures easy digestion. Moreover, eating slowly and masticating the food thoroughly lessens the possibility of overeating.

I believe in a training table. Though it is true that the diet I have outlined does not differ much from the conventional diet, yet the few things which I have suggested be barred, and others which should be added to the athlete's diet, make the difference between proper nourishment and mal-nutrition. Nothing fried, only lean meats, plenty of green vegetables and ripe fruit in season, whole wheat and bran bread in preference to patent flour bread—in short, nothing but clean, wholesome, easily digested, appetizing, fresh food, properly combined and cooked—these things can be obtained

only at a training table supervised by the trainer or the coach. Most colleges and schools cannot afford the expense incidental to running a training table. Instead, however, of having your men eat at innumerable different boarding houses, why not have them eat at one place where the proprietor is willing to follow the above suggestions?

With the aim in view of testing the efficiency and practicability of the above suggestions, I made arrangements last year with a caterer to conduct a “Health Club.” About thirty students were accommodated, and in general the following principles were followed:

1. Lean fresh meat was served but once a day. On Fridays fish took the place of meat on the menu. At all times we ran low on proteins, and this in spite of the fact that there were quite a number of active athletes in the club.

2. Carbohydrate foods, sugars and starches, predominated. Whole grain cereals were served exclusively. Care was taken that the potatoes were mealy and not soggy or waxy.

3. There was always an abundant supply of green vegetables and fruit in season.

4. Care was taken to supply some coarse food daily. We know that concentrated and refined food will cause the intestines to become sluggish. Coarse particles, such as the cellulose of fresh fruit and green vegetables, give bulk to the contents of the intestines and serve to stimulate the peristaltic movement of the intestines, a daily movement of the bowels being thereby assured. Plain wheat bran was placed in bowls on the tables and the men were encouraged to use it in their soup and cereals.

5. For beverage we had milk and cocoa for breakfast, and postum for lunch and dinner. I must admit that I know of no exceptional qualities which would or should make postum a commendable drink, but though it may not be able to do any good, we know that it can do no harm, which is not at all true of coffee. At the club I made no effort to force the boys to use postum, merely recommending it as a beverage more healthful than either coffee or tea. Yet after a few weeks there was absolutely no demand for coffee, everybody calling for the substitute in preference.

6. Whole wheat and bran bread were served exclusively. White flour bread was barred. There are physicians striving for popularity by attempting to justify that which is unquestionably wrong. They make the point that according to its chemical composition white bread should be fully as nourishing as whole grain bread. Maybe so. Anthracite has almost the same composition as a diamond. If the proof of the pudding is in the eating then the proof of the superiority of whole grain flour lies in the fact that it is more easily digested, that it is of value to the system in preventing constipation, and that the very opposite is true of white flour bread, it being hard to digest and one of the chief causes of the predominance of constipation. Whole grain bread is superior to patent flour bread.

7. All the foods listed under "Dietetic Abominations" were barred.

The results of the experiment were what was to be expected. The observance of common sense principles of dietetics proved beneficial to the members of the club. Without exception they greatly enjoyed and liked the clean, nourishing, appetizing food, all showed improvement in health, and were rarely bothered with digestive disorders.

Coach Robert C. Zuppke, commenting upon the physical condition of some of the members of the varsity basketball squad who were eating at the club, stated that he had never seen athletes in better condition than these men during the time they ate at the "Health Club." The rate charged by the caterer was the current local rate, at the time.

CHAPTER V

BANDAGING AND TAPING

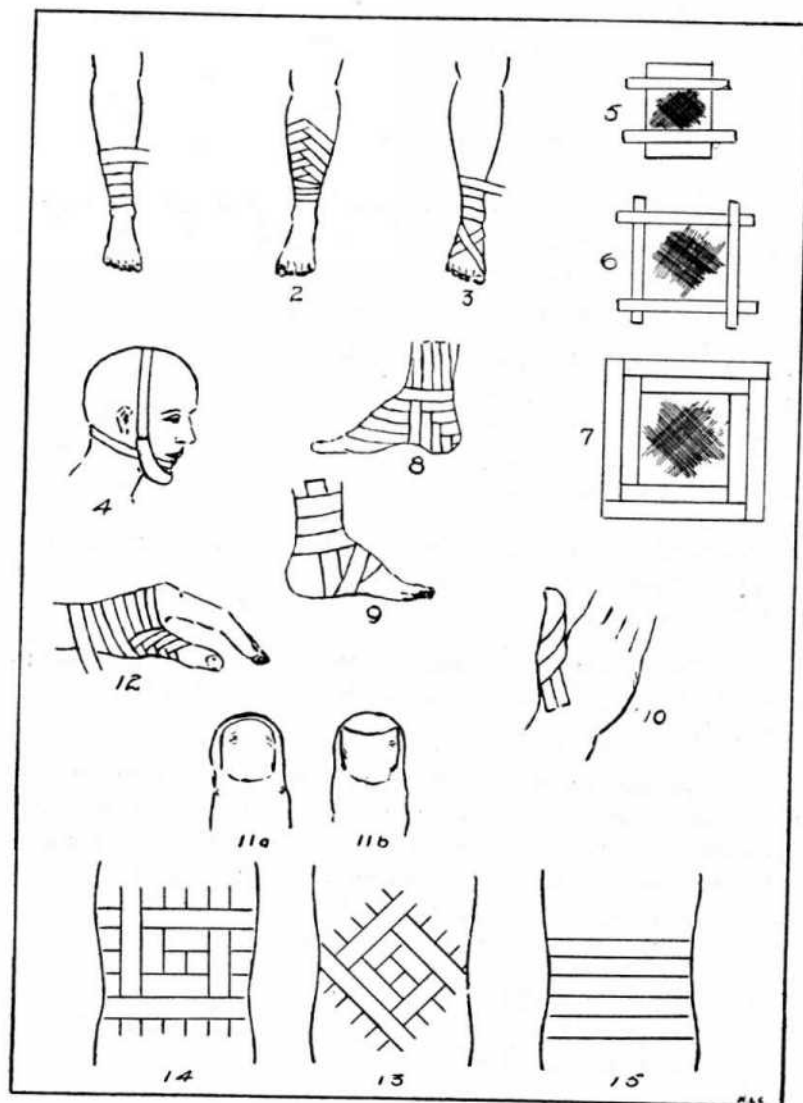
Thoroughness is the prime essential in bandaging, in the application of dressings to wounds, and in strapping with adhesive tape. "Any old way" wouldn't do, since the application is made for a definite purpose and consequently must be made systematically.

The materials generally used by the trainer are—zinc oxide adhesive tape of varying width, two inch adhesive being most commonly used; two inch muslin or cotton cloth roller bandaging; two or three inch gauze roller bandaging; and sterile gauze for wound dressings, obtainable in wax sealed cartons.

Bandages are used primarily to hold dressings in place and to provide support to weakened parts. There are three fundamental methods of bandaging the limbs or any part of them:

1. **The Spiral or Circular**—(Ill.1)—A series of ascending spirals or turns, each succeeding one partially overlapping the preceding one.
2. **Reverse Spiral**—(Ill.2)—This method is a modification of the spiral. Each succeeding spiral is inverted at a definite point (generally the middle line of a limb) so that its upper margin becomes the lower margin. The advantage of this, is that the bandage can be made to fit a tapering limb, or any conical part. The Spiral and the Reverse Spiral are generally used in combination.
3. **Figure of Eight**—(Ill.3)—This bandage is exactly what the name implies—completed it has the form of the numeral 8. It is most useful in bandaging joints.

When applying a bandage have the limb in the position it is to remain after the bandage is on. All bandages should fit snugly, the pressure being evenly distributed, and care should be taken to avoid creases and wrinkles. Another vital point to remember is not to interfere with the circulation. All roller bandages must be



1. Circular Bandage. 2. Reverse Spiral Bandage. 3. Figure of Eight Bandage. 4. Lower Jaw B. 5, 6, 7. Dressings for Wounds. 8. Gibe Bandage. 9. Single Football B. 10. Recurrent B. of Thumb. 11a. Wrong Way of Trimming Toe Nails (causes "ingrown nails"). 11b. Right Way. 12. Combination B. 13. Small of Back Diagonal B. 14. Small of Back Checker Work B. 15. Small of Back Overlapping B.

"fixed" at the start, by making a few turns, and they should always be applied from below upward.

Knotted Bandage of Head—"Place the portion of the bandage lying between two rolls upon the temple of the injured side. Carry the two rolls from opposite directions around the head and back to the starting point. When they meet take a half turn and the rollers are then carried around the face. On coming back to the starting point take another half turn and pass the rolls around the head. Repeat a few times." I consider this a very efficient bandage for the purpose.

Lower Jaw Bandage—Cut a strip of muslin roller bandaging one yard long and three inches wide. Leaving a space of about seven inches at the middle of the strip untouched, split both ends of the strip in half. Knot the ends on the untorn part. Apply the untorn part to the jaw, tie the two upper streamers back of the head and the two lower streamers on top of the head. The part applied to the jaw may be made to fit better by slitting it about three-quarters of an inch below its upper border. This top strip will fit into the groove of the jaw. (Ill.4).

This bandage made of soft leather or chamois serves as a reliable first aid brace in fractures of the lower jaw.

Dressings for Wounds—Only sterile gauze should be used in dressing wounds. Such gauze can be obtained in well sealed paper boxes, and the utmost care must be taken not to expose the gauze to any possible source of infection. Cut the gauze of a size sufficient to overlap the wound approximately one inch on each side. The dressing may then be fastened in place with strips of adhesive laid crosswise (Ill.5), or by taping down the margins (Ill.6), or the latter may be further strengthened by applying a second layer of the adhesive partially overlapping the first (Ill.7). Do not tape across the wound if exposing it to the air will aid the healing process. If necessary fasten the dressings in place with roller bandaging.

Antiphlogistine Bandages—Occasions for the application of antiphlogistine are very frequent in athletics, and consequently a practical rather than an elaborate method of application is desirable. A very simple method used by many trainers is to place the

mud in a cloth sack which is then held on the part affected by means of roller bandages. The objection to this method is that much of the medicinal qualities of the antiphlogistine goes to waste.

Method 2. Place the hot antiphlogistine on thick oil paper. Bend over a margin of one inch of the oil paper so as to prevent the escape of the clay. Cover the antiphlogistine with a layer of gauze. Paint the surface to be treated with a layer of iodine and invert the prepared application over the area so that the oil paper will be on top. Carefully strap the margins with adhesive. Cover with a layer of cotton-wool to aid in retaining the heat and incidentally in absorbing the liquid part of the antiphlogistine. Fasten the whole in place with a combination Spiral-Reverse Spiral bandage. The danger of the contents leaking out may be obviated if the margins be taped with care and the whole application be reinforced with roller bandaging. Should the previously heated clay prove too hot for the patient to bear, it may be mixed with some of the unheated.

Method 3. Have prepared cardboard frames, about six inches long, four inches wide, about an inch deep and tapering at the top. Cover the lower part with gauze and tape the latter to the sides of the frame. Place this sieve-like arrangement over the area to be treated, fill with antiphlogistine about three-quarters of an inch high, cover with oil paper, and tape the margins Gibney fashion. Cover the whole with cotton-wool to retain the heat, fasten the dressing in place with gauze roller bandaging and adhesive. Use for "charleys."

Method 4. Paint the surface to be treated with tincture of iodine. Cut a piece of sterile gauze to cover the area. Tape the gauze down with narrow strips of adhesive. Now form a box-like receptacle for the antiphlogistine with four strips of two-inch wide adhesive, about half an inch of the lower borders of which are made to adhere to the strips of adhesive with which the gauze was fastened—the gummy side of the adhesive facing outward. Fluff some cotton-wool and adjust around this box-like receptacle so as to brace its walls. When the receptacle is ready fill it with the clay as hot as the patient can comfortably bear—cover with oil paper and a double layer of gauze. Tape the whole application Gibney fashion (checker-work effect); cover with cotton-wool, and further fasten

with roller gauze bandaging. This is a very elaborate method and incidentally a very expensive one. Can be fitted to any surface and can be made any size.

TAPING

Taping is the colloquial term for strapping with adhesive. It forms a very important part of the trainer's work. In general the application of adhesive is made for protective and therapeutic or remedial purposes. Thus a part of the body may be naturally weak and therefore in need of temporary support or protection, may have been weakened by injuries, or finally may be so protected as a preventive measure. Whatever the reason or object, the fact remains that certain parts of the body, and especially the joints, must be protected by taping. The use of adhesive tape supports is indispensable since it lessens to a great extent the danger of injuries and consequent incapacities.

Here I may say that the Gibney system of taping is undoubtedly the superior of all others. The essence of this all-important system centers in the fact that the successive layers of adhesive partially overlap or form a network or a checker-work, this interweaving adding to the strength of the support. The uses of this method of applying adhesive are almost limitless in scope.

Ankle Taping—In athletics the ankle joint is the one most liable to all the injuries characteristic of a joint, namely—sprains, dislocations, and fractures. Consequently an artificial support of some sort is an absolute necessity, and strapping is undoubtedly the one reliable means of attaining the object. The wearing of fitted ankle elastic bandages is of no practical value. Its aid is purely psychological and that is of no help to a man making a zig-zag run on a field full of treacherous little holes.

Every trainer has his favorite ankle "tape" and is willing to back his own favorite to the limit. Personally I have tried out various tape arrangements and have finally settled on the Gibney method as "the one tape." It is the superior of all ankle tapes. It gives proper support to the joint; does not impede the up and down movement of the foot; feels pleasant and comfortable; is liked by all athletes; does not compress the little bones of the outside of the foot arch, and if properly applied lasts a week. These

are about all the virtues a good bandage can be expected to possess. This bandage can be used to equal advantage in football, basketball, baseball, and for the treatment of sprained ankles. Back field men in football prefer the Gibney tape to all others.

Gibney Ankle Bandage—(Ill.8)—Note this general rule which is of vital importance in strapping the ankle joint—**always hold the toes bent up and the foot everted** so as to favor the outside ligaments of the ankle joint—since it is these ligaments which are most frequently sprained in athletics. Moreover if the foot be held everted, it will be found that when the bandage is completed and the foot is allowed to slip back into its natural position, the bandage will be found to fit just snug enough entirely to restrict the lateral movement of the joint and yet will not in the least compress the neighboring blood vessels.

Bend toes up, evert the foot then and hold it everted throughout the procedure. Start the first layer of the adhesive on the inside of the foot two inches above the ankle joint—parallel and close to the Tendon of Achilles (the large tendon at the back of the leg). Carry the strip of the adhesive under the heel up on the outside of the foot, pull the tape snug—make sure the foot is everted—and fasten one inch higher than the starting point. Press the tape down to make it adhere. Warming the gummy surface previously to applying will help in hastening it to adhere. (Place the rolls of adhesive on radiator.) This is the first perpendicular layer. Now the horizontal. Start at about the mid-point of the inside of the foot, follow the lower border of the foot around heel, pull snug, and fasten at the mid-point of the outside of the foot. Start the second perpendicular layer parallel to, and partially overlapping ($\frac{1}{4}$ inch) the first layer. Follow with a second horizontal similarly overlapping the first layer. A third perpendicular followed by a third and a fourth horizontal complete the bandage. The horizontal layers should not meet in front, since, if they do, the up and down movement of the foot will be restricted, and this is undesirable. If the ankle joint is weak an extra perpendicular layer may be added.

Take due care that the adhesive is laid on smoothly and not full of wrinkles and creases, which may cause local pressure, interference with the circulation, and irritation. To help this bandage to "get set" a combination Spiral Figure of Eight gauze roller

bandage is applied tightly over the tape and the athlete is instructed to keep off his feet for about five minutes. If this is not done the tape will soon get loose and the bandage will become worthless. If $1\frac{1}{2}$ inch strips of adhesive be used, three perpendicular and four horizontal layers will prove sufficient to form a strong supportive bandage. This bandage should last a week, but if it comes loose in the meantime it may be reinforced with a Figure of Eight.

A variation of the Gibney bandage described above, is to carry the perpendicular layers instead of straight up on the outside of the foot, across the front of the leg just above the ankle joint. The horizontal layers remain the same. This gives additional leverage. This method of strapping is used extensively in the army for the support of weakened or flat arches.

Figure of Eight Tape—This bandage is simple, effective, and economical. It can be used by high schools and smaller colleges who cannot afford the expense incidental to the more extensive methods of strapping. Tape alone may be used or a combination of a muslin, cambric, linen, in fact any stout non-elastic cloth bandaging with adhesive.

The Figure of Eight tape bandage gives ample support but as a whole does not compare favorably with either the Gibney or the Single Football bandages. Its chief disadvantage lies in the fact that it seems to press on the little bony projections of the outside of the foot, causing irritation, and, if the bandage be kept on at night, even sleeplessness. I mention the Figure of Eight tape, but I have no word of recommendation for it.

Figure of Eight Cloth Ankle Roller Bandage—Strapping with adhesive is useful, but much can be said against it. The tape left on for a week irritates and weakens the skin, predisposing it to infections. Constant use of an artificial support tends to weaken the ligaments of the foot. And the expense involved is great. The problem of how to get rid of the objectionable features of taping has probably been faced by most trainers.

Some years ago I did some experimenting in an effort to solve this problem and as a result am in position to submit suggestions based on concrete results. It is of interest to note that within the last few years a great number of colleges and schools have dis-

continued strapping with adhesive except on day of game. The bandage which is coming into almost universal use is the Figure of Eight Cloth Ankle Roller.

The outstanding fact in favor of this bandage is that it can be put on just before practice and removed on coming off the field, thus resting the feet overnight and assuring sound sleep. Again the technique of the bandage is easily taught and the boys soon learn how to put them on themselves. However, warn that carelessness in applying the bandage makes it valueless as a support.

The kind of cloth used is of little import except that it must be strong enough to act as an effective support, must not be of such thickness as to feel cumbersome, should be washable so as to last a season, and soft enough to fit into the hollowed contour of the foot arch. Cotton flannel, muslin, light canvas, have all given me good service. Buy the cloth by the yard and have the assistants cut it into strips $2\frac{1}{2}$ inches wide and about 8 feet long. The bandages should be hung up to dry after using, and sent to the laundry about once a week.

Procedure of Application (Ill. 3)—Flex the toes and keep them flexed. Evert the foot (bend it outward and upward) and keep it everted until the bandage is complete. Start on the ridge of the foot arch, carry the bandage on the inside of the foot under the arch, up on the outside. Cross over the arch upward, around the ankle, placing the strip above the joint and carry back over the arch to the starting point. Repeat the application of the layers until the desired strength of support is obtained—generally five to six turns answer the purpose. Fasten with a strip of adhesive. As far as possible lay the bandaging on without creases and wrinkles, close, but not too tight fitting.

There need be no doubt of the dependability of this support if properly applied. Carelessness, as I said, makes it worthless. For games it is advisable to use the Gibney Ankle tape.

This bandage may be recommended for college athletes for practice, since it can be removed daily, thereby giving the compressed feet a rest and preventing the tenderness and the irritation incidental to strapping with adhesive.

A variation of the Figure of Eight tape is used by many trainers. In this method of strapping, two loops of the adhesive are incomplete, i.e., they are not carried clear around the ankle

but the strips are attached on the inside of the leg just above the ankle joint, and the whole is fastened in place with a complete Figure of Eight. This makes an effective bandage even for games.

Single Football Bandage—The first perpendicular strip (which acts as a lever) is started on the ridge of the arch of the foot, with the foot everted, carried to the inside, under arch, up on the outside, running parallel and close to the Tendon of Achilles, fastening the strip about two inches above the ankle joint. A second strip starts where the first ends and is carried around the leg, the object being to hold the first layer in place. Complete with a Figure of Eight layer around the ankle joint.

The Double Football Bandage used for games differs from the "Single" in having two perpendiculars and two Figure of Eights, the second layers partially overlapping the first.

These two bandages are meritorious and were used on the Illinois athletic squads for two years with undoubted success, though I have preferred to use the Gibney bandage for reasons aforementioned. The trouble is that wherever the Figure of Eight is used, and left on overnight, complaints will be heard of discomfort, pain and inability to sleep, due to the pressure on the bones of the outside of the foot.

Shoulder Tape—Where a sore spot is present, if the injury is extensive and painful, it should be protected with a layer of cotton-wool, a pneumatic rubber doughnut, a rubber sponge, or even an aluminum protector, but where limitation of motion is the only object, use the Gibney Shoulder Tape. The first strip of adhesive one inch in width (split two-inch tape in two), is started on the back, at the lower border of the scapula, close to the spine, carried upward across the shoulder, running down the chest parallel to the sternum, fastening about six inches below the level of the shoulder. This is the vertical layer. Starting at the neck, the second strip is carried along the middle line of the shoulder, over the tip of the shoulder to about six inches down the arm—perpendicular to the first layer. The third strip is started where the first ended, carried parallel to the shoulder over the arm back to where the first strip was started. Repeat these alternations with partial overlapping until a checker-work of the desired strength covers the shoulder. Note that the manner in which you apply the third strip will de-

termine the degree of movement in the shoulder joint. The lower it is placed on the arm, the more will the motion of the joint be restricted, and vice versa.

Recurrent Bandage of Fingers or Toes (Ill.10)—A series of uncompleted Figure of Eights, each succeeding layer partially overlapping the preceding one. A very useful bandage in injuries of fingers or the thumb.

Rib Tape—Generally used for cracked or sore rib. Start a strip of adhesive close to the spine, bring forward on chest, instruct patient to exhale and then quickly fasten strip close to the sternum. A second and third strip, each partially overlapping the preceding one are applied similarly. Be sure the strips are applied while the patient is exhaling and from below upward, that is the first strip is the lowest. The object of the strapping is to restrict the movement of the chest wall on the affected side.

Flat Surface Tape (Ill.14)—Use the Gibney checker-work system.

Wrist Tape—A few turns of cotton or gauze roller bandaging laid on snugly, followed by a layer of adhesive will suffice. I would recommend the use of some simple effective wrist support for those who need it daily, as for instance, linemen in football. The daily taping of a large number of men is quite a waste of time and money.

Small of Back Tape—Sprains of the small of the back are common, and occasions for the use of adhesive are frequent. The tape may be applied in straight parallel strips, each succeeding strip partially overlapping the preceding one (Ill.15), or the Gibney checker-work effect may be used, a horizontal layer alternating with a longitudinal one (Ill.14). Still another method is to lay strips of adhesive at an angle so as to fit the hollow of the back (also checker-work effect) (Ill.13).

Spica Combination Bandage (Ill.12)—For the protection of the thumb, wrist, and knuckles. The Spica differs from the Figure of Eight in that one of the loops is larger. Thus a Figure of Eight which would include the thumb and the wrist would have the wrist loop far larger than otherwise. The successive layers partially overlap. Procedure: With one-inch tape start on the inside of

the wrist, carry the strip of adhesive to the outside of the thumb, loop the thumb, taking due care to lay the tape on smoothly. Run the strip back to the wrist and once around it. The second layer is applied similarly, partially overlapping the first one. A third strip may be added if desirable. To include the knuckles simply carry one of these strips over the knuckles and around the hand instead of around the wrist. This bandage is widely used for linemen in football.

Finger Bandage (Ill.10)—Use Recurrent bandage (see preceding page) and if the finger is painful, tape it to its neighbor, which by limiting its motion, tends to lessen the pain.

Elastic Bandages—I have already stated that the fitted elastic supports are worthless. The elastic bandages are useful when applied to joints which have a tendency to swell. In such cases the elastic pressure serves as a sort of massage, stimulating the removal of the extravasated material. The Ace elastic bandage is also useful as a removable ankle support.

Whitelocke's Elastic Bandage—The application of this bandage checks extravasation, promotes absorption of effused material, and provides temporary support and immobilization. It is of great value in the treatment of injuries of the knee and elbow joints. Procedure: Have the limb slightly flexed. Encircle the limb with a layer of cotton-wool one inch thick and about twelve inches wide. Start a roller bandage (gauze or cotton) about one inch above the lower margin of the cotton-wool and, as the successive spirals ascend, draw the layer of cotton down snugly, tight enough to exert a steady pressure on the swollen region, yet not so tight as to interfere with the circulation. Stop bandaging an inch from the upper margin. Fix with adhesive to maintain in place. Avoid making creases in the cotton-wool. The limb should be kept elevated while this bandage is on so that the extravasated material is forced up toward the trunk rather than down into the limb.

Pads and Protections—I believe a volume of three hundred pages could be written on the subject of pads and protections and still the coach or trainer would face situations where ingenuity alone could provide him the right sort of pad or protection. My only suggestion in the matter of protection is—use common sense.

Study the case in hand, consider the materials you have, and then figure out the best way of protecting the part with what you have.

There is one outstanding rule to bear in mind—"always bridge over the part you are trying to protect."

AVAILABLE MATERIALS

Sponge Rubber— $\frac{1}{4}$ -inch thickness commonly used. It is superior to felt for many purposes, since it has a certain amount of "give" which felt lacks. A necessity to trackmen as a heel protector; a strip of this rubber makes a dependable shin guard for backfield men and ends—it is to be preferred because it is light and lacks the cumbersomeness of most shin guards. Also protects protruding bones of ankle joint (malleoli).

Vulcanized Fibre (Paper Mache) and Aluminum—serve as floors for your "bridge." They successfully board off the injured part.

Felt—fine for prevention of injuries by acting as a pad, but I doubt its effectiveness as a shock absorber where injuries are already present.

Sheepskin—it will prevent scratches, wounds, etc., but is worthless as protector from violence. It cannot effectively absorb or lessen the shock of forceful impact.

Rubber Sponges—are more effective shock absorbers than felt. Effective when placed over sensitive projecting bone tips, such as at the elbow, shoulder, hip.

Pneumatic Rubber Doughnuts—A most useful item for shielding injuries or sensitive parts. The pneumatic cushion acts as an excellent shock absorber. They are exactly what the name implies—air-filled rubber doughnuts.

Leather—Used as framework. Effective for protections.

Elastic Bandages—such as the "ACE" are useful for support of weakened joints where limited motion is desired.

Elastic Supports—I repeat these are worthless or pretty nearly so. I for one would not depend on an elastic support to protect one of my boys. Does anyone really believe that an elastic ankle support, even when new, will prevent sprains?

Cottonwool—quite useful. Grade B can be used for pads and protections.

Corn Plasters—useful for small injuries.

As a general rule in football the following parts must be protected:

The Medulla Oblongata—at the nape of the neck. A good headgear usually answers the purpose.

The Shoulders—The linemen, especially, should have their shoulders well protected. Pneumatic rubber doughnuts and strapping with adhesive to limit the motion of the point are two effective means of preventing shoulder injuries.

The Elbows—Take care that the elbow pad is where it was intended to be. Frequently these pads slip down and the joint remains exposed. It is better to have no pad than to have one which drags inches below its position. Rubber sponge or a rubber doughnut is a more reliable protection than sheepskin.

The Crests of the Hip Bones—Make sure that the hip protector of the football pants protects. Last fall I had eleven injuries of the hip due to the fact that the hip protector did not protect.

The Knees—A good knee guard is indispensable. For weak or wobbly knees use a hinged steel knee brace.

The Shins—No matter what position a man plays, make sure he has his shin bones well protected. Here again bitter experience talks. I lost some of my best men last fall because their shins were inadequately protected. Paper mache protectors for linemen and felt protectors for backs will serve the purpose.

The external Malleoli of the Shin Bones—may be protected by sewing a pad or sponge rubber on the inside of the shoe, which fits just over the malleoli.

CHAPTER VI

MASSAGE

Massage is the scientific rubbing and manipulation of the tissues of the body. To derive the most benefit from its application, a thorough knowledge of the structure and workings of these tissues is indispensable, as is an understanding of the physiological effects of the different manipulations used in massage. We have no moral right to attempt to repair and to adjust delicate machinery unless we possess a thorough comprehension of its structure. Some of the so-called rub-downs are abominations and often may do more harm than good. Massage will be found to be a very valuable aid in the conditioning of athletes, in the treatment of injuries, and in the cure of various ailments.

The physiological effects of massage are:

1. Massage increases the blood circulation, locally or generally, depending upon the extent of the area treated.
2. Massage invigorates the various tissues of the body and the vital organs.
3. Massage acts as a sedative in cases of nervousness.
4. In cases of congestions of any sort, massage will break up the deposits of waste matter and by increasing the local circulation will aid in removing these. Moreover, the steady inflow of fresh blood will hasten the re-invigoration of the fatigued tissues or organs.
5. By quickly removing the products of fatigue, massage helps recuperation after severe mental or physical exertion.
6. By means of massage it is possible to stimulate the functioning of the various vital organs—heart, lungs, stomach, liver, kidneys, nervous system, etc.
7. Massage may be considered as a sort of passive exercise system, and by means of it, it is possible to prevent muscle waste

which frequently follows an injury. Moreover, it is possible to keep the muscles of the athletes, who are for some reason unable to take active exercise, in the best of condition.

8. Massage, by re-invigorating and stimulating the tissues, will strengthen weak muscles and joints.

9. Massage can be so applied as to invigorate the peristaltic movement of the large intestine, thereby aiding excretion, preventing constipation and its accompanying evils—headache, dizziness, etc.

10. Noted surgeons have emphasized the fact that massage is invaluable in the treatment of sprains, dislocations, and fractures.

“It may be said in a general way, that whenever we desire to modify profoundly the processes of nutrition; to remove effete matter from the system; to stimulate assimilation and invigorate digestion; to soothe nervous irritability and relieve nerve pain; to arouse dormant nerve force; to remove morbid deposits from inflamed joints, and thus restore their normal mobility; to equalize the circulation, drawing blood from the hot head, congested abdominal viscera or laboring heart, and accelerating its passage through cold extremities—we may find a safe resource in massage.”

Massage has a certain number of definite manipulations and each of these has a definite purpose and a definite effect:

EFFLEURAGE

A stroking movement with the palmar surface of the hand applied firmly, evenly, and always in the direction toward the heart (like stroking a cat's back).

Effect of Effleurage—Mostly superficial. It increases the peripheral circulation reflexly, by first forcing the local blood supply upward toward the heart, and as the pressure of the hand is removed, a vigorous inflow of fresh blood follows. If the contact with the part treated be light and the movements slow, the effect will be sedative—indicated in nervousness and headaches.

FRICTION

A circulatory rubbing movement with the tips of the fingers, thumbs, or palms of the hands, applied with pressure and force proportionate to the strength or solidity of the tissues treated.

Effect of Friction—Breaks up deposits of fatigue poisons; loosens up sore muscles; increases local blood circulation; aids in hastening removal of effused material; increases metabolism.

KNEADING

Four varieties:

(a) **Petrissage**—Superficial kneading with the tips of the fingers; a combination of a rolling, squeezing, and stretching manipulation executed by grasping the muscle or the skin (remember the manipulation is a superficial one) between the fingers or the hands (pinching).

(b) **Rolling**—(The limb should be flexed to a right angle in order to relax the muscles.) Grasp the mass of the muscle with one or both hands and roll on the bone or tissues beneath, at the same time squeezing and compressing the tissues.

(c) **Wringing**—Exactly what the word implies. With the limb flexed, twist and wring the muscles on the bone.

(d). **Shaking or Chucking**—With the limb flexed, put one hand under the muscles and shake vigorously by alternately pulling up and releasing the muscles—a sort of up and down movement.

Effect of the Various Kneading Manipulations—These movements are most valuable in the massage of athletes. They aid in loosening up the muscles, renew the blood supply to the deepest layers of muscles; break up deposits of fatigue poisons and hasten their elimination—in short they are the best means for recuperating fatigued muscles.

PERCUSSION OR STRIKING MOVEMENTS

In these the two hands are used in alternation; the movement is from the wrist, which serves to make the blows elastic and springy, rather than heavy and hammer-like, which is the case if the weight of the entire arm be used. There are four different percussion manipulations:

(a). **Slapping**—Use the palmar surfaces of the hands. (Like slapping one's face.)

(b). **Clapping**—Differs from slapping in that the hands are shaped in the form of a cup, producing a hollow sound when the body is struck.

(c). **Hacking**—Separate the fingers; hold them loosely and

relaxed. Strike the body with the inside (ulnar) surface of the little fingers, at the same time allowing the other fingers to drop loosely, the whole producing an invigorating vibratory effect. If the fingers are held tense when they strike the body the vibration will not occur, and the manipulation will be unpleasant to the patient.

(d). **Beating**—Use closed fists. Beat with the ulnar surface of the fists. Make the blows elastic and use the hands in alternation.

Effect of All Striking Movements—Stimulating, invigorating, and exciting. Never apply percussion movements to bony surfaces.

THE PROCEDURE FOR A FULL MASSAGE

Have the patient reclining on his back, covered with a woolen blanket. Place a hot fomentation on the abdomen to draw a large supply of blood to the organs contained in the abdominal cavity, thereby stimulating them to increased functioning. Uncover only the part to be massaged, and cover again as soon as you are through with the part, since there is always danger of chilling the patient. The muscle should be thoroughly relaxed, since but little benefit can be derived from the massage of tense muscles and it soon tires the masseur. Use some lubricant—my favorite is warm olive oil, but cocoa butter, talcum powder, or cotton-seed oil will answer the purpose. Following the massage the oil lubricant should be washed off, since if left on it will result in the clogging of the pores. It must be understood that the lubricant has no special medicinal value. Warm olive oil acts as a sort of sedative of the superficial nerves, but outside of that its value lies chiefly in the fact that by use of it we are able to prevent irritation of the hair follicles, which occurs when the dry skin is massaged. Furthermore, in massaging the dry skin one is sure to pull the hair—hardly an enjoyable sensation. Using a lubricant allows the manipulations to be smooth and pleasant. The duration of a full massage is forty-five minutes.

PATIENT ON BACK

1. **Leg**—(stand at side):

(a). Effluage five or six times up and down leg from toes to hip, using both hands and forcing the blood toward the heart.

(b). Slapping and friction of the soles of the feet—in order to increase the circulation. This is of especial value during the cold months and for patients with a poor blood circulation.

(c). Circular friction of the toes, followed by stretching and twisting of the toes.

(d). Friction of foot, flexion, extension, rotation, and circumduction of the foot.

(e) Friction of whole leg. Thorough friction around knee joint. Always massage joints thoroughly since the circulation thereabout is generally sluggish and congestions of waste matter and morbid material are common.

(f). Hard friction and kneading of the thigh muscles.

(g). Effleurage three or four times the whole length of the limb.

Bend leg to a right angle.

Friction and petrissage of the calf muscles; rolling, wringing, and shaking of the calf muscles.

Extend leg—

(a). Effleurage the whole length of the limb three or four times.

(b). Percussion (slapping, clapping, beating and hacking) of the whole limb but avoiding bony places, i.e., the patella of the knee and the shin bone.

(c). Effleurage whole length of the limb five times.
Same procedure to other leg.

2. **Arms**—The order of manipulations is exactly like that of a massage of the lower limbs.

3. **Chest**—Stand at head of the patient.

(a) Effleurage down sternum and up sides of chest, four times.

(b) Friction with thumbs and fingers of the whole chest; follow with palm of the hand friction.

(d). Effleurage, (e) kneading, (f) petrissage, (g) percussion, (h) effleurage.

4. **Abdomen**—Stand at right of patient. Get a mental picture of the exact location of the large intestine and its course in the body. Remember that it travels up right side, turns to run laterally across upper portion of the abdominal cavity, makes another turn to start downward on the left side, forms a letter S and ends in the rectum which lies close to the left side of the bladder. Now the contents of the large intestine in being excreted follow the course of the intestine. It follows that if we want to stimulate this excretory movement we must do so in the direction of the current and not against it. It is advisable to bend the knees before proceeding with an abdominal massage since it will help further to relax the abdominal muscles. Procedure:

(a) Effleurage in circles from right to left side.

(b) Friction with the tips of the fingers from the umbilicus outward.

(c) Kneading of colon with fingers so as to force its contents along toward the rectum.

(d) Kneading with closed fists with the same object as for C. Especially indicated in cases of chronic constipation.

(e) Effleurage, followed by mass kneading of the abdomen, the force of the kneading regulated by the amount of adipose tissue present.

(f) Kneading, petrissage, pulling, wringing, and rolling of the abdomen.

(g) Effleurage—and finally percussion or slapping movement, which should be given while the legs are extended and the abdominal muscles are tense.

PATIENT FACE DOWN

Place hot fomentations (folded towels wrung out in hot water—hot as the patient can comfortably bear) along the spine to stimulate the whole nervous system and incidentally to relax the muscles of the back. Routine:

1. **Back of Leg**—Stand at side—follow the order of manipulations as given from the front of the leg and thigh.

2. **Back**—Stand at patient's head.

(a) Effleurage down the spine and up at sides, seven or eight times.

(b) Friction with thumbs, fingers, and later with palmar surfaces of the hands of the whole back—very hard friction of the large muscles of the back.

(c) Petrissage and kneading of the whole back. Pulling, wringing, rolling, and shaking of the muscles.

(d) Effleurage a number of times followed by percussion of the spine.

(e) Vigorous friction of the whole back.

(f). Percussion, slapping, hacking, clapping, and beating of the back.

(g) Effleurage.

Follow a full body massage with a short warm shower bath succeeded by a short cold one. In athletic training these full massages are of great value in hastening the recuperation of "stale" athletes, or for those who need bolstering up, or on occasions to keep an athlete's muscles in good condition when he is for some reason unable to take active exercise. It is an excellent remedy for staleness, since it not only aids in removing the accumulated waste matter but also serves to keep the athlete's muscles in condition.

Take care, however, not to massage too hard a man who is tired out. A vigorous massage uses a man up fully as much as does a hard workout. The force used in the manipulations should be proportional to the condition of the patient and the object sought to be attained.

In connection with the massage corrective or medical gymnastics may often be given with much benefit to the patient. In fact where it is necessary to build up weak or injured parts such exercises are indispensable. These systems of exercise are of Swedish origin, and they consist of a series of graduated passive and active movements of flexion, extension, rotation, abduction, and circumduction.

Passive exercises are effective in bringing injured and weakened joints back to normal. These exercises are given by the operator while the patient is completely relaxed. Active exercises are taken by the patient himself. The main object of medical gym-

nastics is to loosen the joints and break up adhesions which have formed, thereby allowing free movement of the fluids of the body (blood and lymph). At the same time such exercises help to remove all pressure from the nerves. The subject of Medical gymnastics is, however, too broad for me to take up in this treatise. A number of excellent books on the subject can be obtained in any modern library.

The theory of contracted or partially subluxated joints causing pressure on the neighboring nerves and interference with the free circulation of the fluids of the body is in accord with the teachings of the osteopath. An osteopath attributes all disease to mechanical obstruction, and having a thorough knowledge of the anatomy of the human body he strives to remove this obstruction—he is an "anatomical engineer." An osteopath of my acquaintance who has specialized in the treatment of athletic injuries, claims that it is just as important to remove all irritation from the central nerve (located in the spine) which controls the affected part, as it is to apply local treatment, for, he asserts, if this irritation is removed an unrestricted flow of blood and lymph to the part will follow and since these fluids are the only true curative forces of the human body, recuperation will follow. This theory sounds reasonable and should be taken into consideration by the training profession.

Athletic rubs are modifications of a full massage. The same manipulations are used but with less attention to the technique. Kneading and friction movements predominate, and much less time is taken. The main object of these rubs is, of course, to aid the body in hastening the removal of the fatigue poisons and the reinvigoration of the muscles. These rubs will be considered further under the headings of the various teams.

CHAPTER VII

HYDROTHERAPY

Water is a valuable aid to the trainer, in both the conditioning of athletes and in the treatment of injuries. The basic value of hydrotherapy lies in the fact that by means of water applications at certain definite temperatures we are able to regulate, directly or reflexly, the local or general circulation of the fluids of the body, namely, the blood and the lymph. The blood is the protective and curative power of the body; the lymph the nourishing medium. It follows that where either one of these is needed an increased supply to the part would prove beneficial. On the other hand there are occasions where a lessened supply of blood is indicated, for instance in inflammations. By means of hydrotherapy we are able either to increase or to decrease the local blood supply.

Let me briefly review the physiological factors which make hydrotherapy such a valuable factor in training:

(a) Hydrotherapy gives us the power to stimulate or to inhibit the local or general circulation of the body fluids.

(b) Metabolism (nutrition) is increased in the parts heated. Hot applications cause a vigorous flow of blood and lymph to the part treated, and these are the carriers of nutrition.

(c) **Short applications of heat stimulate; prolonged, weaken; short, cold applications invigorate; prolonged cold lower the resistance of the body.** Cold applications are beneficial only if they are followed by a reaction—a pleasant sensation of warmth and added vigor. The alternation of hot and cold applications accentuates the effects.

(d) Cold applications, prolonged, inhibit growth and development. Incidentally they retard all inflammatory conditions.

(e) Cold hastens the coagulation process of the blood and is therefore indicated for use in stopping hemorrhages.

(f) It is possible by reflex stimulation to control the blood supply to any part of the body. Thus in congestive headache, heat applied to the extremities and to the abdomen will serve to reduce the blood supply to the head and consequently bring relief.

(g) "Local heat applications increase the number of leucocytes which are scavengers of germs and our protectors."

HYDROTHERAPEUTIC PROCEDURES

Half Bath—Fill bath tub half full of hot water, as hot as can be comfortably borne. Immerse only the lower limbs—the object being temporarily to increase the supply of blood and the rate of circulation in the limbs. The effect sought is purely local. Duration of bath fifteen to twenty minutes. Always finish with a cold bath.

Use of Half Bath—At the start of a training season athletes are frequently bothered with stiff or sore legs. This bath is one of the best remedies for it, frequently relieving the complaint in one application.

Full Bath—Fill bath tub with hot or cold water, as desired.

Use of Full Bath—Hot, very short, followed by a cold shower, is excellent for recuperation after prolonged physical or mental exertion. Hot, prolonged, followed by a cold shower and an alcohol rub is an effective substitute for a steam bath. Cold—used for morning plunge, is a powerful invigorant. The plunge should be short and a reaction should follow. Preceding and following the immersion with a dry, coarse towel rub will help to get the reaction. A full tub bath at body temperature acts as a sedative and is indicated in conditions of extreme nervousness or sleeplessness.

Sitz Bath—Galvanized iron sitz bath tubs may be obtained from any plumbing supply house. Common galvanized iron wash tubs will answer the purpose. These may be filled with hot or cold water, according to the effect desired. The two are frequently used in alternation, accentuating the effects. Only the pelvic and the abdominal regions should be immersed. The patient is instructed to sit down in the tub, keeping the feet and the upper body out. The effect sought is to stimulate the vital organs located in the abdom-

inal and the pelvic cavities—the stomach, the liver, the intestines, etc.

Use of Sitz Bath—For athletes, cold sitz baths taken daily will prove one of the best means of relieving fatigue and re-invigorating the body. The immersion should last about two minutes, taken immediately after the shower bath. For a time it may be necessary to keep after the men, encouraging the use of these sitz baths, but they soon come to like the invigorating effect which follows the bath and then encouragement is superfluous. Hot sitz baths are used for severe cases of constipation. By increasing the local blood circulation the digestive and eliminative organs are stimulated to increased functioning, resulting in better digestion and quickened elimination. Hot and cold sitz baths used in alternation (3 minutes in hot and 1 minute in cold) are even more effective in helping digestion and elimination. Cold sitz baths may help to prevent hemorrhoids, or later when they have developed, to relieve the pain and stop the bleeding incidental to this very bothersome complaint.

Sponge Bath—Use the same kind of tubs as for sitz baths. Fill with tepid or cold water in which is dissolved to saturation, common sea salt. Provide ten or twelve sponges to a tub. This salt solution is invigorating, astringent, and antiseptic. The men should be instructed to sponge their bodies with it. This will serve as an invigorant. Then the antiseptic quality of the solution will aid in preventing the spread of infections, such as boils. If at the start of the season the feet of the athletes be soaked in this brine, the astringent power of the salt will “toughen” the feet and thereby prevent the many ills to which the athletes’ feet are subject, at the start of practice. We have always used the salt sponge bath during the football season, and there is no reason why it should not prove as helpful to trackmen, baseball men and others.

Shower Bath—The athlete’s mainstay. Its uses will be considered in the next chapter. Remember this—a **short hot shower followed by a short cold one aids recuperation after violent exertions; a prolonged hot shower, or a prolonged cold shower, both reduce the resistance of the body, and are detrimental; a short cold one, if followed by a pleasant reaction and a feeling of warmth, is an effective invigorant.**

Fomentations or Packs—are cloths wrung out in hot or cold water. Woolen or flannel cloth serves the purpose best by retaining the heat longest. Linen is next in effectiveness; in a pinch coarse Turkish towels may be used. Fomentations are a valuable therapeutic aid to the trainer, since it is by the use of them that he is able to regulate the local circulation. If an increase of the circulation is desired, apply hot packs, or hot and cold packs in alternation; if a reduced supply of blood to the part is indicated, apply cold packs, as cold as can be obtained. Oiling the surface to be treated, just before applying the hot packs, will lessen the possibility of blistering the skin.

Percussion Douche—Consists of a garden hose with a nozzle, similar to one used for spraying lawns. The stream of water issuing through the nozzle is played on the patient according to the following procedure: patient standing with his back to you; turn the water on warm; run the stream up and down the legs, up and down the spine, laterally across the back, in circles on whole back, up and down the spine again. Patient standing with one side to you—arm held overhead, play the stream up and down the whole length of the body, in circles up and down the length of the body, up and down again, drop the arm to the side, up and down the arm; other side the same procedure. Patient facing you—play the stream up and down the legs, up and down the arms, across the chest, in circles on the abdomen. Repeat with cold water only, but of course make the cold application short and snappy. This is another excellent means of building vigor and vitality. The force of the stream of water acts as a sort of mechanical massage which, combined with the benefit derived from the water treatment, makes a very valuable addition to the trainer’s means of aiding recuperation of run-down athletes.

Hot Air, Steam or Electric Light Cabinets—All of these have the property of relieving congestions of waste matter in the blood by inducing sweating. A natural sweat (through exercise) is always to be preferred, but the trouble is that a man who needs a steam bath rarely has vigor enough to get up a sweat through exercise. A portable hot air or steam cabinet can be obtained from any drug supply house for about five dollars. There is a gradation of prices, reaching as high as five hundred dollars for some

makes of electric cabinets. Every trainer should have some sort of sweating apparatus.

Procedure—Have the patient drink two or three glasses of hot or cold water before entering the cabinet; place a cold towel on his head and see that it is kept cold. The duration of the treatment depends entirely on the patient. To set a time limit is ridiculous. Some men seem able to stand more, some less sweating. Have the man quit when he thinks he has had enough, and shows signs of feeling uncomfortable or distressed. Finish with a cold shower bath and a brisk, vigorous alcohol rub. Instruct the man to dress warmly and breathe deeply, going home so as to prevent a chill.

Thermolite—a handy, therapeutic lamp providing concentrated heat, powerful in effect, and penetrating. It is handy and



effective in the treatment of athletic injuries. The cost is nominal and it is advantageous to have a number of these lamps on hand in the training room. Hand one to the injured athlete and instruct him to heat the affected part. Treatment can be continued at home by permitting the patient to take the thermolite along.

Photophore or Arc Light—I used a 500 candle-power globe. The advantage of the arc light over the hot water fomentations is that the heat rays penetrate more deeply, while the effect of hot applications on the deeper lying structures depends on the derivative or reflex effect. Then again the arc light heat is concentrated, continuous, and time-saving.

High Frequency—The usefulness of this variety of electrotherapeutic apparatus has been exaggerated. Its effect is primarily

that of a counter-irritant, and it is most efficient in the treatment of skin diseases.

Galvanic, Farradic and Sinusoidal Currents—are all of great value to the trainer. These currents can be used to relieve congestions, such as muscle bruises; to promote the removal of effusion, and to stimulate fatigued muscles or nerves to increased activity. If you obtain a first-class outfit you will find it easy to operate, but be careful—you can do more harm than good by careless, unscientific application of electrical currents.

Medical Vibrator—I think that every training department ought to have one. "It reduces extravasations, breaks up and removes adhesions, relaxes contracted parts, and contracts relaxed parts, lessens stiffness, stimulates, increases blood supply to the muscle, renders it firmer and more elastic. . . ." Its uses are practically limitless. Cheap ones lack penetrative force. Good vibrators range in price from \$35 to \$125.

Electric Heat Packs—Where continuous heat applications are indicated these packs are efficient and handy.

Bakers—Various bakers for the treatment of injuries are on the market. All are useful though to varying degrees. The best I have ever come across is Dr. Tyrnauer's resistance coil baker. The temperature may be raised to 340° F., which assures a vigorous hyperaemia.



CHAPTER VIII

FOOTBALL

Now the season is opened. Your efforts have been successful—the boys are back looking trim, muscular, vigorous, alert, bright-eyed, clear-skinned—truly men to be admired, athletes not merely in name. The coach has reason to be pleased since he is able to start right in on the serious work of building his playing machine. To the trainer, also, the football season with its numerous problems of conditioning and treatment of injuries, is a time of great responsibility.

First Day Out—Have a weight card ready and instruct the candidates for the team to record their weight, going out to practice and coming in after practice. The weight cards are an indispensable adjunct. The fluctuations in the weight of the individual from day to day are the best indicator as to his condition. Once a man is in "shape" he should hold his weight from day to day. Thus the 3 to 6 pounds lost in a daily workout should be regained by the time he steps on the scales the following afternoon. When a man loses weight continually, keep your eye on him. He is on a negative balance, burning up his own bodily tissues and you can't keep that up long. He may go stale.

Coach Borleske points out that a daily study of the weight card enables you to appreciate just how strenuous your practice sessions are. It is a barometer which will tell whether you are overworking your men or whether you can drive a little harder. The loss of weight following an afternoon's workout will also give you a line on the zest with which the individual members of the squad go through the routine. You may be able to detect the man who is "soldiering" on the job and thus throws a greater burden on his mates.

Have the men cut their toe nails closely and properly, i.e., slightly hollowing the middle of the nails (Ill.11a and 11b). The feet should be soaked in cold brine, thoroughly dried and then painted with any one of the following astringents: Tincture of

Benzoin, Alum solution, Tannic acid solution, 1% Formaldehyde solution. All of these are effective astringents. Personally I have always favored the plain (not the Compound) Tincture of Benzoin. Powdering the feet with talcum powder or the common foot powder made up of Boric acid and a little Tannic acid is sure to prove helpful in anticipating foot trouble. There is no over-emphasizing the importance of toughening the feet at the start of the season. Keep the prescribed treatment up for four or five days and longer if necessary.

Start bandaging the ankles as soon as training begins in earnest. Make your choice of the bandage you will use during the season. If you decide to use the cloth Figure of Eight bandage (see under Bandaging) give each man a pair and show him the correct way of putting them on. These bandages must be put on every afternoon before going on the field. After practice remove the bandages and hang them up to dry. They should be gathered and sent to the laundry at least once a week. This, or for that matter any supporting bandage, must be applied properly or it will be worthless. A loose or misplaced bandage is no protection.

Should you prefer strapping with adhesive, use the Gibney Bandage (see under Bandaging). I generally tape my men Monday, leaving the adhesive on until Friday after practice—if there is a game on Saturday, or until Saturday after practice if there is an open date. Then the tape is removed, the feet are cleansed with gasoline or benzine to remove the remaining adhesive, and then thoroughly washed with soap and water, painted with tincture of benzoin, and allowed to rest until the following Monday afternoon, when they are re-taped. The best and least painful method of removing adhesive from hairy surfaces is to make it snappy—the pulling off of the adhesive must be forceful and decisive. Deliberateness is sure to cause agonizing and protracted pain, while a quick pull is almost painless. However, note—do not pull the tape upward off the skin—a vigorous pull upward may carry along some of the skin—but pull sideways, at the same time holding the skin above with the other hand. Occasionally the skin of the feet is irritated by the adhesive and an eczema-like rash breaks out. For treatment see under "Athletic Injuries." If there is a game Saturday, the tape is removed Friday, the feet are washed, painted with tincture of benzoin, and re-taped Saturday,

about ten o'clock in the morning in order to allow the men to get used to the bandage.

A number of the candidates will be found to have some part of the body, susceptible to injury. This may be due to natural or acquired weakness of the part. Ascertain the nature of the weaknesses in advance and provide suitable protections. Thus previously injured shoulders, weak knees, and falling arches must have special protections or supports.

At the start of the season the men beside following out the routine of training laid out by the coach, must spend about half an hour a day in special toughening-up drills. It will be found that most injuries afflict teams at the start of a season. This is the time when the coach is likely to lose the best men of his team through injuries. This is easily enough explained by the fact that at the start of the season the physical condition of the men is not such as will enable them successfully to withstand the roughness of the game. Later in the season, when the condition of the men improves, the body becomes inured to punishment, and injuries are rarer. Thus setting-up exercises and toughening-up drills, by hastening conditioning prove of inestimable value to the team. As a rule every alert coach has some sort of system of his own for conditioning his men, and this should be carried out with diligence.

Personally I am in favor of daily setting-up exercise drills of fifteen minutes' duration to precede the regular training routine. The exercises may be followed by the following effective toughening-up drill:

1. Line men up, do a front dive with a forward roll.
2. Do a series of continuous forward rolls.
3. Do backward rolls.
4. Lie prone on the ground, arms close to side, roll along the ground (as if rolling down hill).
5. From position at "attention" fall straight forward, lessening the shock of the fall by the use of the arms.
6. Take a short run and then a long dive, gliding along the ground on the chest and the abdomen.
7. Crawl along the ground "turtle" fashion.

8. Take deep knee-bending exercises to strengthen the knee joint. Also rising on toes exercise for the ankle joint.

9. Pair men of equal weight and have them playfully wrestle, with much tumbling. (On the hard ground, of course.)

After working out for a while the men soon perspire freely. Take care that they do not stand around and allow the sweat to evaporate, since it will cause a loss of much heat from the body, thereby reducing the resistive power of the individual, and resulting in chills and colds. Especially is this true on very cold days, when it would be advisable to have the men rubbed with camphorated oil, lard, or "hot stuff." Canvas coats lined with sheepskin or felt should be an adjunct to every training department and, when a player for some reason is forced to stand on the side lines, he should put on one of these. I am very much in favor of wearing sweat shirts under the canvas coats. These shirts cling to the perspiration-soaked jersey and thus prevent too rapid evaporation. They are economical and durable and come in handy in many ways. If a man does manage to contract a cold, attend to it immediately. Break it up with a steam bath and a laxative.

On the field during practice or a contest have handy a pailful of oatmeal water, prepared by soaking for one hour a glassful of rolled oats in a gallon of water. Allow the men to moisten their mouths by taking a gulp of it. Plain cold water may be used, but the oatmeal water is to be preferred since it has the quality of keeping the mouth moist for some time. Under no circumstances should the players be allowed to drink water during the practice session or during a contest. After practice they may drink all they crave, but in moderate quantities at a time. Drink only cool water, not cold. It may not be as tasty as a cold drink, but it will serve the purpose of allaying thirst.

On Scrimmage Days—Tape the shoulders, wrists, and thumbs of the linemen (see under Bandaging). Some trainers tape the whole wrist and hand excepting the fingers. I cannot see any special virtue in such a bandage. The bridge of the nose, especially if it is scratched, should be covered with a small strip of adhesive, since such injuries, if constantly irritated, are very slow in healing and tend to leave disfiguring scars. Provide suitable protections for the hip bone, the shins, and the external malleoli. Insist that every man, irrespective of whether he is a lineman or a back,

should have his shins well protected. A strip of felt two or three inches in width and in length sufficient to cover the whole of the shin bone, makes an effective shin protector for backs.

When injuries occur, apply first aid and then remove the man to the training quarters. If the injury is serious, it is advisable not to work the team hard or scrimmage them that day, since the injury to one of their comrades is sure temporarily to depress the stoutest hearts. The average football player is game and will strive to fight off depression, but human nature is to be reckoned with, and the effect of a serious injury to one of their fellow teammates temporarily weakens the strongest of them.

As soon as the man is comfortably lying on the table, remove his clothing with care, disturbing the injured part as little as possible. There is no justification for cutting and tearing parts of football clothes if it is possible to remove them without undue pain and disturbance to the patient. Rip the seams if necessary. Examine the injured part thoroughly, make a careful diagnosis, and apply the treatment indicated. If the injury looks suspicious—if you suspect that it may turn out to be more serious than it appears to be—play it safe by immediately referring the case to a physician.

There are injuries which time alone can cure. Do not hesitate to take and keep a man out of practice. The average trainer is too anxious to please the coach by rushing an injured man back on the field. This is a grave mistake. Cool judgment must rule, and if you know that the man is not well enough to go in, then do not take foolish chances. Make haste slowly. No matter what the coach will think or say, the welfare of the man is intrusted in your hands—**do what you think is right, not what is expedient.** Do not send an injured man out on the field only to get him injured worse than before. Moreover a sound scrub is as good, if not better, than an injured star.

While the men are out on the field let us go through the training quarters. These should be sunny, airy, and clean. The rubbing tables should not be over 32 inches in height, 72 inches in length, and 30 inches in width. With table sufficiently low, the masseur or rubber is able to use the power of his shoulders and back, to help his arms and hands. Whilst if the table is high, he can use only his arms, and that soon tires him out. The tables can be cov-

ered with dark blankets, canvas covers, sheets, or large sized Turkish towels. The last two are, of course, most hygienic, the linen being washed daily. Small pillows encased in canvas covers may be used for head supports.

The assistant trainers must be earnest, loyal, conscientious, and ready and willing to do their very best for the team. They should be healthy, vigorous, well-built boys, clean morally and physically. Teach them the science of massage and require good work. Very frequently these all important positions are given to men who care little about the work and all about the pay that goes with it. Now I favor giving these positions to athletes if they need them as badly as do others, but I see no reason why they should be permitted to give inferior service on the ground that they are athletes. These positions are not for the support of the athletes, but of worthy boys who are trying to work their way through school. I should give the athlete preference on only one condition, and that is that he realize he must earn every cent he gets by doing his best for the team.

The assistants should heed the complaints of the athletes and report these immediately to the head trainer, for the average athlete is very lax in reporting injuries (there are men of the opposite extreme, always complaining of something or other) or symptoms of an ailment, and failure to do so may delay treatment and incapacitate the man at a time when he is most needed. The rubbing should be done with vim, vigor, and snap, which is the only way to stimulate and re-invigorate fatigued athletes. A slow, draggy, half-hearted rub leaves the boys more tired out than ever.

The shower room should be kept very clean. The shower heads should be so arranged that the stream of water issuing through them should bear straight down and not out to the sides, as is frequently the case. A sign encouraging the use of cold sitz baths and cold salt sponge baths (see Hydrotherapy) should be hung in the shower room. The surest way to have the boys do a thing is to keep it in their minds constantly. Sitz tubs should be provided, and the assistants should fill them while the team is on the field. Some of the tubs should be filled with cold water, others with the brine solution. Sponging the body daily with the cold salt solution not only serves as an effective invigorant, but the solution having antiseptic qualities prevents widespread infections,

such as boils, which occur at times around the training quarters. Be especially insistent that this rule be abided by when the boil germ makes its appearance in epidemic form.

While the team is on the field the assistants should put the training quarters in order, fill the sitz tubs, and see to it that a can of antiphlogistine is kept hot, since practically no day passes but it is needed.

Practice over, the players should take a short warm shower followed by a short cold one, their sitz bath and sponging, dry themselves thoroughly, especially between the toes and in the crotch (failure to dry these parts predisposes, in the first case, to soft corns, and in the second to gym itch), take their rub, and report to the trainer for the treatment of injuries and ailments. A vigorous rub with a coarse Turkish towel is as effective an invigorator as the best massage.

Here I may suggest that following the shower it would be a good plan to have the men lie down for about ten or fifteen minutes. A short period of complete relaxation is the surest and quickest way of hastening recovery from the fatigue brought about by strenuous exercise. Lack of proper accommodations or space often makes this impossible.

The men should be well cooled off before rushing out into winter breezes.

As the season progresses the approximate line-ups of the first and second teams become apparent. These men are worked harder and consequently the trainer is justified in paying more attention to them than to the scrubs. They should have preference on the rubbing tables and with the trainer. It is not that we tend to cater to stars, but simply that these men are athletically of more value to the team. It certainly is disgusting to see a man who is on the squad only because he has somehow obtained a suit, claim precedence over a first line man on the massage table or with the trainer.

The football rub is a modified full massage (see Massage), covers the whole body, and lasts ten to twelve minutes. The procedure:

1. Effleurage (stroking); friction (circular rubbing); kneading (shaking, twisting, etc.); and percussion (slapping, beating,

hacking, and cupping) are applied in the order given to (1) limbs, (2) chest, (3) abdomen, (4) back.

Since the time available for a football rub is rather limited, less attention is paid to the technique of massage, than might otherwise be done, the main object being to stimulate the circulation, thereby hastening the removal of the fatigue poisons, and to reinvigorate the tired muscles. The kneading and percussion movements predominate, the former serving to loosen the congestions of waste matter and the latter acting as the invigorating medium. For a long time I used the following rubbing mixture: One quart of grain alcohol (never use denatured alcohol, which is a poison whether it is used internally or externally), three quarts of witch-hazel, and a few drops of iodine, mixed thoroughly. This makes an invigorating, antiseptic compound. The coming of prohibition makes it hard to obtain pure grain alcohol, but the medicated alcohol sold under various patent names is the exact equivalent, adulterated with some harmless (to the skin) chemical substance which makes the grain alcohol undrinkable. Do not rub with concentrated alcohol unless you are trying to reduce a fever. Prepare the rubbing mixture in the proportions given above, and when through with the rub, wipe the body with a towel. Alcohol evaporates easily and in doing so causes the loss of much bodily heat, leaving the body chilled and uncomfortable. This objection, of course, applies only to seasons of the year when conservation of bodily heat is advantageous.

For reasons of economy place the rubbing mixture in copper or aluminum oil cans, squirting just enough to lubricate the part of the body to be massaged. Don't keep the mixture in the cans for any length of time since it has a tendency to form rust. Remember never to massage without a lubricant since it is sure to result in an irritation of the hair follicles and to cause the patient discomfort and pain.

The men must be impressed with the importance of reporting injuries as soon as they occur. Attend to these at once. Nothing will go away of itself. Be patient with injured or stale men. They are often cranky—ill-temper is a by-product of disease. When a man is forced to stay out of play on account of an injury, give him daily body massages to keep his muscles in the best of condition. If, however, the injury is such that it will not prevent the athlete from

taking active exercise, then there is no doubt that the latter is preferable. If he is able to run signals, protect the injured part well, and send the man out.

During the football season the men should report at the training quarters Sunday afternoons and be given a full body massage with warm olive oil followed by a percussion douche. This will greatly help in relieving fatigue, re-invigorating the athletes and preparing them for the strenuous week ahead. Incidentally particular attention may be paid to those injured, or ailing in any way. Some coaches favor a 3 to 4 mile hike on Sundays to work out the stiffness caused by Saturday's game. I think a massage and rest more effective.

The last meal before a contest should be eaten at least three hours before the scheduled start and be very light. The simpler the combination, the easier and surer the digestion (see Diet).

There is no cure for nervousness except self-control. A certain amount of nervousness is really a necessity to an athlete, since it serves to put the man on edge, but extreme and prolonged nervousness is weakening and must be fought off by the individual as any other unworthy feeling. Keep your mind on something else.

During a game the trainer running out on the field of play should carry along a bottle of oatmeal water, a pail full of ice cold water with four or five sponges in it, a towel, smelling salts, a roll of adhesive; a dry towel (impress on men importance of drying hands thoroughly after handling a wet sponge or the water bottle); have a sift-top can of powdered rosin and be liberal with it (no team can afford fumbles). The trainer must remember not to talk shop to the men. It is against the rules and in a tight game may mean a disastrous penalty.

Take care of the player who is temporarily taken out of the game. Keep him warm. It may be advisable to send him in for a rest or even a short, cold shower, and a change of shirts.

Between halves have the men lie down. Remove helmets. Loosen belts. Stretch out comfortably. Relax to the utmost. Wipe their faces with towels soaked in ice cold water and then dry thoroughly. A cold towel on the forehead helps to normalize the circulation, clear the head and invigorate the man. Hot beef tea may be served, a cupful to each man. Some favor giving an orange to suck—not to eat. The trainer should pay most attention

to those who need it most. If a man complains of a sick stomach, which is a rare occurrence in football, give him a teaspoonful of aromatic spirits of ammonia and peppermint in a wineglassful of water.

The trainer will have to insist that after a game all injuries be attended to at once. Elated over a victory or depressed over a defeat, the players fail to report injuries, dress rapidly, and rush off to fill a date. The next morning they come straggling in, complaining of sprains, wounds, or "charleys." Failure to treat the injured part promptly has given the complaint a flying start, and much valuable time is lost.

Celebration of a mid-season victory does not justify the breaking of training rules. I have in mind the case of a crack hurdler who, having helped the team to a victory, decided that he deserved to have a good time. So he marched down town and ate and drank all he possibly could. The next day he was down with an acute attack of dyspepsia which lasted long enough to make him useless to the team in its next battle. Training rules are exacting, but they must be recognized as necessary to a team's success.

On trips the trainer will have to guard the quantity and the quality of the food served the team. A thorough study of dietetic rules will enable him to choose a menu suitable for the needs of the men. He will have to guard that the men do not gorge. A favorite trip meal of the Illini squads has been the following: Sirloin steak, baked potatoes, toast or bran bread (never white bread), ripe olives, celery and baked apple or ice cream for dessert. Ice water should not be allowed. The difference in the chemical composition of the drinking water on trips may prove disastrous to the chances of a team by disabling its members. Demand pure spring water wherever you go. To assure having the right kind of water, the kind the men are used to, and the kind that cannot do them any harm, most college teams generally carry distilled water with them on their trips.

All meals should be served promptly. There must be no waiting for service. I have always made this a point to be taken up with the hotel management. After the meal the men should rest for about an hour. Then a short walk may be taken to break the monotony of the waiting. Do not permit sight-seeing before a contest.

BASEBALL

Only weak ankles need be bandaged. During the spring training period and at the start of the season massage the throwing or pitching arms daily with a little olive oil. Soaking the arm in hot water for about three minutes followed by rubbing with a chunk of ice or a cold wet towel is an excellent method of relieving soreness and of invigorating the muscles of the arm. The fact is that hot and cold alternate applications are far more beneficial in relieving fatigue of muscles than massage. The chief object is to increase the local circulation so as to hasten the removal of the fatigue poisons, and there is no better means of effecting this than by the use of hot and cold packs in alternation.

The pitcher's arm should be well protected from the cold. Light massage with olive oil or "hot stuff" or capsoline, will aid in keeping the arm warm. After a workout or a game, the pitchers should have the whole upper part of the body massaged, since the throwing motion involves the musculature of the arm, neck, shoulder, and back.

TRACK

It is quite generally accepted among trainers that trackmen are the hardest athletes to train. To a very large degree this can be attributed to the fact that the sport itself is conducive to the development of temperamental, high-strung athletes. In track no man can do his best unless he is nervously "on edge." The regrettable thing is that this edge tends to persist even after competition. The trainer, however, must recognize that nervous tension is a quality indispensable to trackmen and their being exacting and irritable is an inevitable consequence.

Pre-seasonal conditioning is practicably indispensable for track men. The legs alone do not always carry a man to victory, but the whole musculature of the body co-operates in giving him the necessary drive to win a race. Moreover, trackmen must be in the best of condition at the start of the season since this sport makes strenuous demand on the vitality and nervous stamina of the athlete and starting the season with a good supply of both is bound to prove helpful. The candidates for the team should, therefore, start training systematically as soon as they return to school in the

fall, and apply themselves with diligence and earnestness to the task of attaining an all-around development. Particular attention should be paid to the upbuilding of the upper body and the abdominal muscles.

The injuries peculiar to trackmen are: "shin splints," "stone bruises," "pulled" tendons, and cinder scratches. At the start of the season there will be many sore and stiff legs. Carefully graduated training, aided by massage, may prove successful in preventing such soreness. Shin splints are due to overwork of untrained muscles. Stone bruises and cinder scratches may be considered unavoidable; they are results of accidents. Most cases of "pulled" tendons are preventable. Warn the men carefully to warm-up before "letting out," especially on cold, wet days. Massage with "hot stuff," and plenty of jogging are of aid.

Indigestion is a frequent ailment and is often accompanied by constipation. On the squad there will always be found a number of men who have a tendency to chronic constipation, and these should have their diet regulated, their abdomen massaged daily, and they should be encouraged to take sitz baths to invigorate the abdominal organs.

At the start of the season rub only the legs. These should be thoroughly kneaded, shaken, loosened, and invigorated. The procedure of a track rub is as follows:

Man on Back—Effleurage (stroking with palms) from toes to hip; friction of palm of foot; friction of toes; friction of whole foot (this part of the treatment more extensively if the patient's feet are cold, indicating a poor blood circulation); circular friction of the lower leg; friction and kneading around the knee joint; friction, kneading, and grasping of the thigh muscles. **Bend the leg to a right angle**—knead, shake, and grasp the muscles of the calf of the leg; same manipulations to back thigh muscles. **Extend leg**—effleurage a few times whole length of the limb and finish with percussion (slapping, hacking, cupping, beating) of the fleshy parts only. Remember the rule about avoiding bony parts when giving percussion manipulations.

Man face down—Effleurage of the whole limb; friction of the limb (starting at the foot and traveling up); deep kneading of the whole limb: **Flex knee to a right angle**—knead, shake, and grasp muscles of calf and of the thigh. **Extend leg**—effleurage length

of limb; percussion of limb. I use witch hazel for track rub downs. A little medicated alcohol may be added.

As the season progresses problems of conditioning begin to arise and full body massages may be indicated in some cases. Massage with warm olive oil and finish with a brisk alcohol rub. Watch out for colds and break them up quickly, since they may do much harm in disabling an athlete at a time when he is badly needed.

Beside their work on the track, the men should spend from fifteen to twenty minutes a day exercising with the pulley weights, or a class in setting-up exercises may precede the daily training routine. The development of the chest, back, shoulder arm, and abdominal muscles should keep step with the progressive development of the lower limbs. It is disgusting to see a man with a well-muscled pair of legs and a child's upper body development. Yet such cases are frequently met with.

The track shoes should fit snugly, and the men are to be instructed to cut their toe nails closely. On cold days the men must be provided with flannel underdrawers and "sweat shirts" (flannel jerseys). When in competition and waiting for their turn they should keep warm by wearing bath-robos, or covering up with woolen blankets.

On chilly days which are frequent at the start of the season, excessive heat radiation may be prevented by massaging the body with camphorated oil, lard, cotton-seed oil, or on very cold days, with "hot-stuff." Pay particular attention to the back of the thigh muscles. Loosen them up thoroughly by massaging, put on the "hot stuff," and warn the athlete to take time in warming up. These muscles of the back of the thigh are the ones most liable to be "pulled."

The recipe for "hot stuff" is: one quart of camphorated oil thoroughly mixed with about three tablespoonsful or more, according to the strength desired, of synthetic oil of wintergreen. The latter is a very expensive drug, and for the sake of economy "hot stuff" mixtures are frequently prepared by using ammonia, chloroform, or capsicum.

The suggestions regarding showers and sitz baths as found in the chapter on "Football" are equally applicable here. A short warm shower followed by a cold one and completed with a cold sitz bath is an effective routine.

Track meets generally start about two o'clock in the afternoon. The morning meal should be eaten not later than seven, and a very light luncheon may be served at eleven. After luncheon the men should go up to their rooms and rest. A quarter to one the men are called and a little after one they are on the field getting ready. A slight shaking-up of the muscles may be given before the events. Tendons which have been pulled should be thoroughly massaged and covered with "hot stuff."

If the meet is to be held at night, the routine suggested for basketball should be followed.

For "come-backs," undress the man; rub his whole body with a coarse towel wrung out of cold water, dry him thoroughly, allow him to lie down, covering up to keep warm. A cold towel to his forehead may prove helpful. Just before his event is called give him a short, snappy invigorating rub with alcohol. Should the man show signs of lack of vitality or be to all appearances "pepless," give him a short cold shower followed by rubbing with a dry Turkish towel, to assure a vigorous reaction. If a man vomits after a race, do not worry. The undigested, partly fermented food is better out than in. You will find that as a general rule the athlete will always feel better after he has vomited. If he is nauseated or sick at the stomach give him one teaspoonful of aromatic spirits of ammonia and peppermint (a small bottleful of which you should be sure to have with you on the day of a meet).

Suppose you are competing in a place where there are no showers. Have a pail full of warm water. Dip a coarse Turkish towel in it and as the men get through with their events, rub them down thoroughly with the towel. This will serve to wash off the perspiration and the rub acts as an invigorator. Then instruct them to dry themselves thoroughly with a coarse towel. Carry your own towels. Where there are no showers there are probably no towels.

In this respect I must relate an interesting experience. It was during the Milrose meet held at the Madison Square Garden last fall that I happened to be in the training quarters of a big Eastern university. This particular team had a night on and were "cleaning up." As the runners came in sweated-up, tired, but happy, they found neither showers nor towels. Some proceeded to dress. Others made an effort to dry themselves with their

sweat shirts. I noticed particularly one slim little fellow who had run a great half-mile and looked pretty well petered out. A boy in that condition must be taken care of. No one did anything for him except to offer hearty congratulations. As I saw the youngster trying wearily to dry himself and thought of the chilly winter breezes outside, I wondered what the results would be. Yet the boys were in charge of a well paid trainer. It is evident that someone either wasn't on the job or knew no better. Moral: Take care of your boys if you expect them to do their best for you.

On trips take care to stop at clean and attractive hotels. The mental condition of a track team is frequently a big factor in determining their ability to do things. As far as possible keep the men comfortable and satisfied.

The training of the swimming team does not vary in its main essentials from that of the track team. I am not considering the training of the various minor sports since under one heading or another I have covered all possibilities in training and conditioning of athletes and the ingenuity and resourcefulness of the trainer will have to supply the rest.

CHAPTER IX

DIAGNOSIS AND TREATMENT of ATHLETIC INJURIES

Be careful.

Be clean.

Be aseptic. Wash hands with green soap or lysol after handling infected wounds.

Be alert.

Be thorough—any old way is a sloth's old way.

Be considerate—as far as is possible.

Know your limitations.

Diagnose with extreme care.

Don't be unnecessarily rough. Bodily tissues are not made of rubber or steel. Don't pull or jerk unless you are sure what you are about. The someone else you saw do it "just so" may have been wrong and picked it up as you did by seeing, not by knowing.

Don't fool around with fractures or uncommon dislocations.

Don't be too anxious to hustle an injured man back into harness. You may aggravate a healing injury and permanently disable the player.

Don't pay attention to every Tom, Dick, and Harry, when an emergency arises. The cheapest thing on the market is advice from onlookers. Let them talk. Follow the routine of treatment you are sure of. The dope in the following pages is reliable, scientific, practical, proven. It isn't merely my own ideas. It is the cream of all there is on the treatment of athletic injuries.

Don't be too hasty in following new suggestions even if the source is apparently reliable. Science does not accept statements unless they are backed up by facts netted by experimentation. Test new ideas.

When the occasion is most exacting, is the time for you to suppress all emotion and act coolly and decisively. You may never be forced to face a very serious injury, but if you do, act with the surety and thoroughness expected of a man of responsibility.

Be economical in the use of first-aid supplies.

In the treatment of athletic injuries, heat in any of its forms is your best friend.

ATHLETIC INJURIES AND TREATMENT

Dislocations—Dislocations occur rather frequently among athletes. The usual cause is violence. The symptoms are—deformity of the joint, with the end of the bone in an abnormal position, there being a depression where the head of the bone is supposed to be; loss of function—inability to make use of the joint; rigidity of the surrounding muscles; pain and tenderness. When examining a case do not be too hasty in forming conclusions as to the diagnosis—**guard carefully for fractures**—note whether the end of the bone rotates with the shaft.

The primary treatment of dislocations consists in the immediate replacement of the joint. Since dislocations are serious injuries involving a more or less extensive laceration of the surrounding tissues, the replacement should not be attempted by one who has had little experience in first aid. Unskilled attempts at replacement have been known to do much harm. It follows then that only a trainer who has had much experience in replacing dislocations is justified in treating such injuries. Those lacking experience should rely on the medical adviser of the team.

Some dislocations are easier to replace than others. Thus dislocations of a thumb, finger, wrist, ankle, or even the shoulder joint, can be safely replaced by any cool-headed first aid man. The danger of harming the joint will be obviated if the trainer remembers the golden rule that in the replacement of dislocations it is the

steady, powerful pull and not the rough jerk that "turns the trick," for a dislocation or a fracture is immediately followed by a contraction of the surrounding muscles. This rigidity of the muscles must be overcome before adjustment is possible. Now the steady traction on the contracted muscles soon tires them, a relaxation follows, and the bone slowly slips into its natural abode. On the other hand the rough jerk seems to stimulate the contractile power of the muscles and instead of relaxation we have increased tenseness. Vigorous, sudden efforts to overcome this tensity, may result in a severe pain or even a rupture of the muscles involved. So remember, replace slowly, steadily, and forcefully.

Dislocations of the Clavicle—(a) The sternal end may dislocate forward or backward. The patient sitting, place the knee against his spine and draw the shoulders upward and backward—the clavicle will snap back into place. To hold it there apply a small leather or felt pad over the point of dislocation and tape it to hold in place.

(b) The outer end may dislocate upward on the shoulder. With knee pressed against the spine, draw the shoulders as far as possible out to the side and backward. Tape with a pad to hold in place.

Lower Jaw—To differentiate from a fracture, a dislocated jaw is immobile, a fractured mobile. The dislocation is generally forward and upward. Patient sits facing you, place the padded thumbs upon the two last molars and grasping the chin firmly between the fingers and the thumbs, press downward and backward on the jaw **at the same time pulling upward from the chin**, steadily but gently. The jaw will snap back into place.

Thumb—Pull the thumb, at the same time bending it backward and with the other hand try to push the dislocated bone back into place. Bandage and tape for a few days. In general to replace any small dislocated bone, apply traction, pulling steadily, stretching the joint while trying to force the dislocated bone back into place. Another method is simply to pull steadily for a few minutes until the ligaments relax and allow the dislocated bone to slip back into its place.

Wrist—Grasp the hand and pull steadily, at the same time rotating slightly until replacement occurs. Dislocations of the

small bones of the wrist should not be disregarded as they are likely to result in stiff wrists. Bandage and tape for a few days.

Elbow—The commonest form in athletics is the backward dislocation of both bones of the forearm (radius and ulna). The point of the elbow will be found projecting. To replace—patient sits in a chair. Rest your bent leg on the chair, place your knee in the bend of his elbow, and, grasping the forearm and the upper arm firmly, pull steadily until the ligaments involved tire and the bones slip back into place. Another simple and effective method is to pull the forearm steadily while an assistant holds the upper arm. An elbow joint dislocation is a serious injury and calls for careful, scientific treatment. Always refer such cases to a physician.

Shoulder—"The very range of movement enjoyed by the shoulder is its source of weakness." "The humerus may dislocate in any direction except upward, for an upward dislocation can only take place if the acromion process is broken off, and this is rare." **"In 95 per cent of the cases the humerus is dislocated downward and forward."** There are two good methods of replacement:

(1) Patient prone on the ground, the operator removes shoe and places his foot in the arm-pit of the affected shoulder; taking a firm hold of the patient's wrist he pulls the arm firmly but steadily, at the same time slowly carrying the arm toward the body. The head of the bone will slip in with a distinct snap.

(2) Kocher's method—1. Flex the elbow to a right angle and press close to side. 2. Turn the forearm as far as possible away from the trunk, thus causing an external rotation of the arm. 3. Keeping the arm in this position start moving the elbow toward, and upward, on the chest. 4. Now move the hand across the chest downward, at the same time beginning an inward rotation of the whole arm (under itself, so to speak), the movement being carried out slowly and as the forearm is lowered and the arm drops to the side, the head of the humerus will be heard to snap back into place. This is a very efficient method of replacement and can be easily learned.

The after treatment of shoulder dislocations is very important since if left alone the joint becomes weak and subject to chronic dislocations—"slunk shoulder." A shoulder dislocation always

involves the tearing of neighboring ligaments. With hot and cold applications, massage, electricity, and progressive exercises it is possible to bring the joint back to its former strength. At first treat the joint with light massage and passive movements to prevent the formation of adhesions. The vibrator will be found very useful for the purpose. As the case improves prescribe systematic exercise with a view of building up the muscles of the joint. A weight in the form of a dumb-bell is an excellent means for this purpose.

Knee—Place the patient on his back. Have an assistant hold the thigh and pull it away from the joint. Grasp the foot firmly and while applying steady traction, rotate the foot gently. If this does not bring about a replacement, pull the leg steadily forward, start bending the knee, placing one hand just back of the joint, pull the leg upward while continuing the bending; here the leg may be rotated gently and the knee will jump back into place. Massage and hot applications to prevent swelling are indicated.

Ankle—Pull the foot steadily forward, at the same time rotating gently. If unsuccessful place the foot in hot water and when the surrounding tissues relax try the same procedure again. The rest of the treatment is the same as for a sprain, which is always a complication. Another method is to have the patient lie face down, flex the knee to a right angle in order to relax the muscles of the calf. Grasp the foot and while pulling steadily upward, rotate it gently.

DISLOCATIONS OF TENDONS

Displacement of the tendons from their natural positions generally occurs as a result of a violent wrench or twist and is always accompanied with a severe sprain.

Long Tendon of the Biceps Muscle—This tendon, located beneath the belly of the deltoid muscle and enclosed in the sheath of the pectoralis major muscle, may slip out when this sheath is torn by a violent movement and "swim" around over the tip of the shoulder. To replace, raise the arm to the level of the shoulder and, firmly grasping the hand, rotate the extended arm, inward and outward. After replacement immobilize temporarily with adhesive (Gibney shoulder tape); apply hot packs and massage daily.

Begin passive movements the second day, at first very light, but gradually increasing the force used, adding resistive exercises and later continuing with active exercises. The immobilization is important to enable the tear to heal.

Peroneus Longus Tendon—The displacement of this tendon with the nerve and the blood vessels which accompany it, **from the groove back of the external malleolus** to its surface is not infrequent in athletics. It is generally a complication of a sprain. The diagnosis consists in "finding a cordlike tendon, which ought not be there, rolling over the external surface of the malleolus." Treatment: Flex and evert the foot, at the same time forcing the dislodged tendon back into its groove. Prepare a leather or a felt pad, fitting it to the groove so as to prevent a recurrence. Tape the ankle Gibney fashion, favoring the outside of the foot. To accentuate this a felt pad may be placed underneath the outside part of the heel. In a few days begin treating the ankle with hot water, massage, and passive movements.

Tibialis Posticus Tendon—This tendon lies in the groove **back of the internal malleolus** and if displaced will be found on its surface. To replace: Flex the foot inward and press the tendon back into place. Apply a felt pad, tape the ankle (this time favoring the inside of the foot), and after a few days, massage and give passive movements.

A suggestion—In all cases of sprains of the ankle joint, run your hand over the surfaces of the malleoli, to make sure there are no tendon dislocations.

RECURRENT DISPLACEMENT OF THE KNEE JOINT FLOATING CARTILAGE OF THE KNEE

This is by no means an unusual case in athletics. It is generally due to a violent movement which chips off a small fragment from the semi-lunar cartilages of the knee. This fragment floating aimlessly around and about the joint slips in between the articulations and causes a partial displacement often accompanied with a "locking" of the joint. The patient falls to the ground suffering unbearable pain. Treatment: immediate replacement. The patient reclining on his back, legs extended, grasp the foot firmly, pull away from the knee joint and rotate the leg gently to the right and

to the left. This is sometimes sufficient to effect a replacement. Another method is to flex the leg upon the thigh and the thigh upon the pelvis. With the leg in this position grasp the foot and rotate it inward and outward. You will find that, as a rule, the patient himself knows the best way of effecting a replacement. Swelling may follow the subluxation and to prevent it apply a Whitelock bandage immediately after replacement. There is only one efficient remedy for this trouble and that is an operation to remove the fragment. The alternative is to wear a special knee brace with a leather pad over the location of the fragment to hold it in place. This, of course, is only a palliative measure, and rarely effective.

DISLOCATION OF THE SEMILUNAR CARTILAGE

The semilunar cartilages of the knee may slip forward, leaving the knee in a semi-flexed position, locked, and causing much pain. Treatment: the patient reclining on his back, bend the knee, grasp the foot firmly and rotate it gently, at the same time forcing the subluxated cartilage (located previously by palpation) back into its normal position. Daily, for a few weeks, apply hot fomentations, give massage and **resistive exercises**, continuing until the trouble entirely disappears.

FRACTURES

There are three varieties of fractures: (1) **Simple**—The bone broken in one place; (2) **Complex**—The bone broken in several places; (3) **Compound**—Where the fracture is complicated with a laceration of the surrounding tissue. Any one of these is likely to occur in athletics, and the trainer's responsibility is limited to diagnosing the case properly, applying temporary aid (splints, etc.), calling a physician, and supplying the after-treatment.

Diagnosis—(1) History of injury—The patient may have felt the bone snap; (2) change in contour of limb; (3) inability to use the limb; (4) roughened or sunken outline along the surface of bone, detected by tracing with the fingers; (5) false joint; grasping the limb on each side of the suspected site of the fracture, bend it very gently. The same movement may produce a cracking sound—

crepitus. Whether you are absolutely sure or just suspicious that the injury is a fracture, do not attempt to move the patient until you affix temporary splints, so adjusted as to make movement between the broken parts impossible. Immediately send for the medical adviser. For splints use wooden planks—padding hollowed places with cotton wool so as to make the splint fit the contour of the limb, and fasten in place with roller gauze bandaging. The replacement of fractures is a part of the physician's work. In compound fractures where the surrounding tissue is lacerated, wash the wound, stop the bleeding and do not apply the splint until the fracture is replaced.

It is in the after treatment of fractures that the trainer can be of great aid in hastening recovery. Using hot and cold fomentations, massage, vibration and passive movements, he can help nature in her efforts to remove the effused material.

All bones of the body are subject to fracture. As a rule, when the larger bones are affected, diagnosis is easy, but we need the aid of the X-ray to detect fractures of the little bones of the wrist or of the foot. The clavicle, humerus, wrist, forearm bones, nose, ribs, lower jaw, patella, lower leg, and ankle bones are most liable to fracture in athletics.

CRACKS OF RIBS

Cause—Violence. Treatment—Tape Gibney fashion, and protect well. It is not a serious injury, but may easily become such.

FLATTENED NOSE OR BROKEN NASAL BRIDGE

Cause—Violence. Treatment—Refer to physician expert in such work.

SPRAINS

A sprain is generally caused by over-extension of a joint due to a violent movement and is usually accompanied by a partial or complete laceration of the ligaments of the joint. It is characterized by a sharp tearing pain, an immediate swelling, due to effusion from the broken blood vessels, and inability to use the joint. The treatment consists so far as possible, in keeping the swelling

out, or if it has already occurred, in hastening its removal. The point to remember is that the healing process is interfered with, if not entirely stopped, by the presence of the effused material. It follows that keeping the swelling out will assure a quick recovery. As soon as the injury occurs, instruct the patient to elevate the sprained part, bandage rather tightly with a cotton roller bandage, and apply cold packs for about fifteen minutes. This may prove painful, but is effective and therefore necessary. Then use hot fomentations for about half an hour, as hot as the patient can bear. Dry thoroughly and tape the part affected Gibney fashion. The next day soak the joint in hot and cold water alternately, remove the tape, and massage derivatively (not on the sore, tender spot but around it) and upward toward the heart. Re-tape. Repeat this procedure daily until the joint is completely healed. Under no circumstances should the joint be rested wholly. Make use of it as far as is practicable. In severe sprains, take an X-ray to make sure there is no complicating fracture. A cane may be used for partial support. The blue-black discoloration which appears within a day or two can be ignored. It is due to the decomposition of the blood which filled the tissue interspaces when the blood vessels ruptured.

In some cases the pain in the strapped joint may become unbearable. The adhesive will have to be removed and the part immersed in water as hot as can be borne. Keeping the limb at a higher level than the rest of the body may bring relief from the pain, without removing the adhesive.

Passive movements may be added to massage after the third day.

Sprain of ankle—The most common sprain in athletics. Treatment—After making sure that there are no complications (fractures, dislocations, etc.), bandage the joint with a cotton roller bandage, elevate the limb and apply very cold applications for about fifteen minutes. Follow this with very hot fomentations for about half an hour. Dry thoroughly and tape either Gibney fashion or Football Tape No. 2 the next day, and repeat the procedure until the foot is healed—remove the tape, have the patient soak the foot alternately in hot and cold water, for about an hour; massage at first gently, but gradually increasing the force of the manipulations. Gentle passive movements such as flexing, extend-

ing and rotating the foot should be given to prevent the formation of adhesions, and finally the foot should be re-taped. The athlete should keep on walking, being instructed not even to favor the injured ankle.

Big Toe—Sprains are a common occurrence. Symptoms usual. Recurrent bandage best. Here cold water is better to relieve the pain than hot water.

Knee Joint—Sprains are common among football players. Cause—wrench, twist, violence or a combination of these. Diagnosis—history of injury, inability to bear weight on the knee, tendency of the knee to cave in to one side, either in or out, depending on which way the force of the blow was applied. Swelling may or may not be present, a very tender and painful spot can be localized just below the patella and indicates the seat of the injury. Often either the internal or external lateral ligaments of the knee are overstretched or partially or even completely torn as a result of the sprain. This is the chief cause of the many cases of weak and wobbly knees which we often meet in athletics. Treatment of the acute cases—apply hot fomentations for about an hour, massage derivatively, above and below the knee; apply Whitelock's bandage (see Bandaging). Remove the bandage daily, and use hot and cold packs in alternation; massage and after the second day give gentle passive movements.

Back—Sprains generally occur in the **small** of the back. Treatment—hot and cold applications alternately. Rather forceful massage can be given at once. Lay the man off for a day or two. Support sprained muscles with a Gibney checkerwork bandage (Ill. 14) or a diagonal Gibney bandage (Ill. 13).

Thumb or Finger—The treatment is the same as for a sprain of the big toe (see above). An antiphlogestine bandage may be applied over night.

Wrist—Treatment—soak the wrist in hot water, massage derivatively, and tape for support. An antiphlogestine bandage applied over night will hasten the healing process.

Elbow—"Baseball elbow" caused by "excessive or faulty exercise of the muscles of the forearm, is very painful at times. The

pain travels down the forearm. Treatment—rest for a few days, hot fomentations and massage.

Biceps of Arm—rather rare. I had one case last year. Pain and tenderness in the upper part of the muscle. Treatment—heat, massage, electricity, and temporary support with elastic bandage.

Shoulder—There are three different varieties of shoulder sprains, and in diagnosing, one should differentiate from an injury to the suprascapular nerve.

1. **Sprains of the Shoulder Ligaments**—generally due to a violent fall on the hand or the elbow. The symptoms are—pain on moving the shoulder and the tip of the shoulder may be swollen. The patient cannot raise his hand as high as his head. He is able to put the arm behind his back or rotate it inward. Treatment—heat, massage, rest, taping Gibney fashion for temporary immobilization. After a few days give passive movements.

2. **Baseball Shoulder**—This is a strain due to a violent throwing motion resulting in the dislocation of the Long Tendon of the Biceps muscles. The treatment of this disabling injury is taken up under "Dislocation of Tendons."

3. **Sprains of the Acromio-Clavicular Joint**—common among football players. Generally caused by a fall on the elbow or shoulder. This injury is characterized by much tenderness and pain in the region of the joint. It takes a long time to get well and for all pain to disappear. Treatment—hot and cold applications, continuous, the longer the better. Complete rest of the joint for a few days. To assure this, the shoulder should be taped Gibney fashion and the arm should be carried in a sling. Daily treat with hot fomentations, massage, and passive movements. Vibration and the sinusoidal current are helpful.

Nerve Bruise of the Shoulder—The injury to the suprascapular nerve is one of the most frequent in athletics. This nerve is located just beneath the depression of the shoulder with no natural protection. A fall on the side of the arm jams the head of the humerus against the nerve, causing an irritation which is persistent and troublesome. The treatment is the same as for a sprain of the acromio-clavicular joint, considered above. A prolonged rest is indicated.

PULLED TENDON

RUPTURE OF MUSCLES OR TENDONS

Cause—A violent twist, wrench or extension of the muscle while the latter is still flexing. "Any part of the muscle or tendon may be ruptured, but most generally nearest the ends, where the muscle fibers blend into the tendinous fibers. A complete rupture is more likely to occur in the long than in the short, flat muscles." The conditions which influence pulled tendons are—season of year, temperature of the air, want of fitness, kind of sport and failure to "warm up."

Symptoms—"Sudden sharp pain localized in one spot. Sensation as if struck by a whip or a stone. History of something tearing. Power to use the muscle involved is lost. If the injury occurs during the race, the man falls to the ground as if shot. The seat of the rupture will be painful, tender, and there may be a depression. To ascertain the extent of the rupture, flex the limb involved, to contract the affected muscle, and feel for the gap with the fingers."

Treatment—If your diagnosis indicates an extensive rupture, call in a physician for consultation. In case of "pulled tendons" an experienced trainer may be far more effective than a physician who rarely meets with such cases. "Where the tendon or muscle is ruptured completely an operation is indicated. Complete ruptures are, however, very rare. The main object of the treatment is to approximate the torn fibers and keep them approximated until they unite." Complete rest in bed for a few days is indicated. As soon as the injury occurs apply very hot fomentations for about an hour. This will aid in "the removal of the effusion which fills the gap and interferes with the union of the torn fibers." Follow this with immobilization with adhesive tape, strapping the affected muscle so as to include its origin and insertion. The object is to provide artificial support and thus to remove all strain from the muscle, preventing further tearing. Give daily treatments consisting of hot and cold applications, massage, very gentle passive movements, vibration, and electricity. As the patient improves, increase the severity of the massage and the exercises. Such an injury generally incapacitates an athlete for a long time. When starting

training again, the man must take care to "warm up" the muscles thoroughly. The wearing of fitted elastic supports is of doubtful value. It is probably worthless as a support, but gives the runner a sense of security.

Rupture of the Semitendinosus—This muscle, which is located on the back of the thigh (carefully study its origin and its insertion), and whose function it is to flex the leg on the thigh, is the one most generally "pulled" in athletics, and very frequently by trackmen. Treatment—after applying hot fomentations for some time, strap the whole upper leg with adhesive tape in circular horizontal layers, each succeeding one partially overlapping the preceding one. The tape should be laid on snugly and should not reach entirely around the limb, but leave a gap of about an inch in front of the thigh, so as to assure non-interference with the circulation. Salisbury's porous plaster may be used. The advantage of the latter is that perspiration is possible and consequently the tape does not have to be changed often. "**Raising the heel of the boot aids in relaxing the affected muscles.**" Keep the patient in bed for at least three days or until the limb begins to feel stronger. Hot water bottles, or electric pads may be applied with benefit. On the second day begin gentle passive movements and derivative massage to prevent stiffening and adhesions. Following absolute rest the patient may start moving about with the aid of a cane or crutches (depending on the severity of the injury). Massage and passive exercise should be given daily. To assure thorough healing, the man should not return to competition for at least two months. When he does start, he should always take care to "warm up" thoroughly and should wear an elastic support. The injury is very likely to recur. The lengthening of the distance of the race may help to lessen the possibility of a recurrence.

Rupture of the Rectus Femoris—This muscle with the two vastus muscles forms the bulk of the muscles on the front of the thigh. Its upper attachment is to the ilium and below it is attached to the upper part of the tibia. Its function is to flex the thigh on the abdomen and to extend the leg. Usually the rupture occurs close to the knee. Treatment—heat applications, rest in bed, and immobilization by taping. If swelling of the knee joint occurs, apply Whitelock's bandage to help remove the effusion. Do not use the joint until it is completely healed.

Rupture of the Quadriceps Extensor—Generally occurs at its attachment to the patella and may be complicated by a fracture of the latter. The symptoms are—inability to extend the knee, tenderness and pain and a depression at the seat of the injury. "If the rupture is close to the patella the matter is serious and a physician should be consulted." Treatment—applications of heat, complete immobilization of the joint by strapping, daily hot applications, and massage. The joint should not be used until thoroughly healed.

Rupture of Ligamentum Patella—"It may be torn from above or below and in each case a fragment of the bone (patella) may be broken off. The rupture may be complete or partial. On diagnosis the patella will be found drawn either above or below its normal position—depending on where the rupture has occurred. Swelling of the joint may follow." Treatment—immobilization with adhesive and Whitelock's bandage. An operation is indicated if the rupture is severe or complete. As a rule such cases should be referred to a physician.

Rupture of the Calf Muscles—Generally the soleus or the plantaris muscles are affected. Usual symptoms. Treatment—strap the whole length of the leg with adhesive, apply hot fomentations, massage, give gentle passive movements.

Rupture of the Tendons of Achilles—"Usually just above its attachment to the os calcis. Usual symptoms. When the ankle is flexed the depression may show clearly. Treatment—strap the ankle Gibney fashion, applying the bandage rather high. Massage daily. The patient may walk about, wearing a high heeled shoe."

Rupture of the Biceps Muscles—Not unusual in athletics. "The long head of the biceps separates from its attachment to the scapula." Complete separation justifies an operation. Treatment—heat, massage, immobilization by strapping, the arm being carried in a sling.

Oblique Muscle of Abdomen—I had four cases in one football season. The cause is generally a sudden violent wrench or twist. The most prominent symptom is pain along the spine of the hip bone. Palpation with fingers will localize a tender and painful spot which indicates the seat of the rupture. Treatment—continuous hot applications followed by strapping with adhesive, the strips

of tape laid horizontally from below upward and reaching high enough to make the movement of that side of the body impossible. Recovery generally in two weeks. One of my cases failed to improve in spite of all efforts. On examination by a specialist, an abscess was found at the site of the injury. This affection is sometimes called "Bowler's side."

WOUNDS

Wounds of all sorts and varieties are frequent in athletics. As a general rule they are superficial, rarely severe, and rarely seriously infected. Yet it is the latter factor that makes a wound a matter of concern. Therefore the trainer's main efforts should be to keep the wound aseptic. Naturally he cannot prevent some germs reaching the wound, but the body is well able to rid itself of these few intruders. It is only an overwhelming germ attack that breaks down the defenses of the body and becomes a source of grave danger. The cause of wounds is self-apparent, and the diagnosis is easy.

Treatment of wounds—remove all foreign matter, such as dirt, cinders, etc., by washing the wound with soap and water, warm borie acid solution, or best of all medicated grain alcohol. If a hemorrhage is present it may be stopped, if slight, by merely painting with iodine, or by the application of a sterile dressing saturated in cold water, with pressure. If the wound is lacerated, even out the edges, approximating the torn parts as closely as is possible. If stitching is indicated refer the case to the medical adviser. Pour Hydrogen Peroxide on wound. Paint with tincture of iodine. "Iodine hastens separation of slough; limits formation of pus and stimulates granulation." Apply a sterile gauze dressing. To prevent the formation of hard scabs, spread a thin layer of some non-irritating salve on the gauze before applying. Vaseline, Unguentine, or Balsam of Peru, will answer the purpose. Do not use zinc oxide salve with iodine. Repeat the procedure daily until the wound is completely healed.

During the football season keep on hand a solution of creosole or lysol and when the players report for the treatment of injuries wash all abrasions with this solution. Be exceedingly careful in the use of these tissue destroying antiseptics.

Small Face Wounds—Wash with alcohol and paint with collodion. (Swimmer's Protection—wash with alcohol, paint with collodion and tape Gibney fashion.)

"Strawberries" (Floor Burns)—Upper layer of the skin is scratched off by sliding, etc. Rather a common occurrence in athletics. Wash with alcohol, paint with iodine, and apply an Unguentine dressing. Repeat the procedure daily until the wound is healed. In some cases the healing is rather slow.

Mat Burns—The skin is rubbed off in wrestling. Treatment—the same as for "strawberries."

Torn off Skin—Common among gymnasts working on the horizontal bar, the parallels, etc. Wash with alcohol. Paint with Tincture of Benzoin. Protect the tender skin with a gauze dressing and adhesive tape.

Cinder Scratches—are generally due to a fall on a cinder track. Thoroughly wash the wound with soap and warm water or clean out the cinders. Wash out with alcohol. Apply a dressing of cottonwool saturated in glycerine or an Unguentine dressing, to loosen the embedded cinders. The next day wash again with alcohol and paint with iodine. If the wound shows the least tendency to become infected apply cottonwool soaked in bichloride of mercury, over night.

CONTUSED WOUNDS

Cause—Violence. Symptoms—more or less pain, tenderness, numbness, swelling and discoloration of the skin. Treatment—diagnose all bruises with care. Make sure there are no fractures. Apply hot fomentations or an antiphlogistine bandage. Application of an AWG (see under Supplies) dressing is very effective, but hot applications are the royal remedy for bruises.

BONE BRUISE

Cause and symptoms similar to above. The pain is pronounced, sickening, persistent. Bone bruises are very slow in healing and are easily aggravated. Therefore be sure to protect well. Bridge over the bruised part. Treatment same as described for CONTUSED WOUNDS.

BLACK EYE—ECCHYMOSES

Caused by a blow rupturing some of the small blood vessels under the skin. Treatment—immediately apply cold in any form—ice, cold water, or steel, with pressure—the object being to stop effusion. After the latter has subsided, apply hot fomentations to remove the swelling.

FOREIGN BODY IN EYE

Instruct the patient to look down. Grasp the upper lid by the eyelashes and pull it straight downward. Draw the lid slightly forward and downward and then invert over a match laid in the hollow of the lid. After locating the foreign object remove it with a swab of cottonwool on the end of a toothpick. Do not expect to find a mountain; the source of irritation is generally even smaller than a mole. Be careful not to irritate the sclera of the eye which is very sensitive and easily inflamed.

CAULIFLOWER EAR

Generally caused by a blow. The auricle fills with blood. The symptoms are swelling and pain. When the swelling is slight, hot fomentations will effect a cure. In more troublesome cases an incision, followed by thorough draining is indicated. Such cases should be referred to the medical adviser. Wrestlers are very likely to get this injury. To prevent—apply a protective bandage, place some cotton-wool back of the auricles, apply a circular bandage with roller gauze (about six turns) around the head, and finish with one layer of adhesive.

ULCERS

"A large wound with thick infiltrated and dusky edges and an indurated base which is often covered with a layer of tenacious white necrotic tissue." Treatment—some of the chlorine antiseptics and germicides, which have lately flooded the market will probably prove effective in the treatment of ulcers. The ulcers we meet with in athletics cannot compare with the extensive war wounds, yet the latter were successfully treated with these new germicides.

The treatment as I gave it in my last edition of this book was as follows: "Wash the wound with hydrogen peroxide to oxidize

the pus material. Wash with alcohol to loosen the necrotic tissue, paint with iodine and cover with a sterile gauze dressing spread with a layer of Unguentine or any other non-irritable salve. Do not allow hard scabs to form, since suppuration will continue underneath the scab. Remove the latter, if it forms, with alcohol. The application of a salve will prevent such formation. If the ulcer is slow in healing, or does not seem to heal at all and the destructive process continues, try the following treatment, which has proved effective in some of my cases. Wash the wound with alcohol, paint with a five per cent solution of carbolic acid, and follow with another alcohol wash. Be careful to use as small a quantity of carbolic acid as possible, since it is likely to cause gangrene of tissue. Then apply your Ungentine dressing. Exposing the ulcer to the rays of the sun or of the arc lamp has proved a very effective means of hastening the healing process of ulcers."

HEMORRHAGE

If the bleeding is slight, painting with iodine and the application of a dressing with pressure will easily control it. Severe hemorrhage calls for specific measures. If the hemorrhage is arterial—the blood escaping being bright red in color, and issuing in spurts—apply pressure with fingers or with a tourniquet (a tight bandage around the limb with a pad over the artery or vein suspected to be involved) above the wound. If the hemorrhage is venous—the blood being dark red in color and flowing in an uninterrupted stream—apply pressure below the wound. Slight bleeding of a wound is beneficial in that the escaping blood cleanses the nooks of the wound more thoroughly than you can.

In prolonged hemorrhage the position of the body may prove a factor to be reckoned with. Elevate the part of the body so that the escaping blood has to flow against the force of gravity.

INTERNAL HEMORRHAGES

Here is a dangerous condition which, if not quickly recognized and aborted, may prove fatal. Fortunately internal hemorrhage of an extensive nature is a rare occurrence in athletics. It is generally due to extreme violence rupturing one of the more important arteries or veins of the body. The diagnosis depends on the fol-

lowing symptoms: pallor and cyanosis of the features, shortness of breath, gasping for breath, rapidly increasing pulse, and a fall of the body temperature to subnormal. If the hemorrhage is close to the skin the presence of fluid may be felt by palpating the part. First aid treatment—immediately send for a physician; elevate the part; apply ice or cold fomentations to the part.

BOILS—FURUNCLES

Cause—as a rule infection by staphylococci, which take root because the local resistance is lowered by persistent friction or an injury or because the general resistance of the body is below par due to lack of vitality (run-down condition). The appearance of a boil is familiar to all. It should be differentiated from a carbuncle, which covers a larger area, is flat, and as a rule has a number of "heads." The treatment of carbuncles should be referred to a physician.

Treatment of Boil—Some surgeons recommend lancing as soon as a boil is detected. Others say "wait until it ripens." The trainer had better follow the latter course because it is the safest. Permitting a boil to "ripen" gives the body a chance to encapsulate the inflamed area so that when the incision is made the probability of spreading the infection is lessened.

To hasten the "ripening" of a boil apply either—

1. Hot antiphlogistine.
2. Cottonwool soaked in hot glycerine.
3. A dressing of Ichtyol ointment (20%).

Treatment of a "ripe" boil—Wash the surrounding skin with grain alcohol and paint with iodine. This will prevent infection from the escaping cocci when the boil is lanced. Incise. See that your knife is sharp. The incision should be parallel to the course of the blood vessels, not crossways, and the opening should be large enough to permit removal of the core. Many surgeons use two incisions, making a cross. When the four flaps are drawn back there is a wide opening. To lessen the pain the area may be anaesthetized with a few drops of ether, by rubbing with a piece of ice, or by spraying with ethyl chloride which is a favorite local anaesthetic, safely and easily applied. When the opening is made the

pussy contents will probably ooze out. Catch them on wads of cottonwool and be careful what you do with these infected wads. Don't squeeze the boil. Rough squeezing will break the protective capsule and permit the spread of the infection. Very gently press down on the sides of the boil, carefully stretching the skin away from the opening. This will flatten the cavity and further empty the contents. If the "core" remains grasp it with a pair of aseptic tweezers and gently draw it out. Don't jerk the "core." Next swab the cavity with a piece of cottonwool saturated with iodine. Again wash the surrounding surface with alcohol and follow by painting with Tr. Iodine. Apply a dressing of Ichtyol ointment or cottonwool soaked in glycerine, either of which will serve to drain out what remains in the cavity. When the boil is thoroughly cleaned out, keep it aseptic by painting daily with iodine and covering with a dry dressing. Change bandages daily until the wound is healed. And finally protect yourself and others by being extremely careful and clean in the treatment of boils.

A boil may subside without coming to a "head." The area remains swollen and red. This is known as a "blind boil."

There are a lot of foolish suggestions as to how to abort or kill boils, but none of them are of any worth. There is no way of killing a boil. Even if there were, such a procedure would be contra-indicated, since certainly no good could result, if the infection were driven from its localized point, all over the body.

ACUTE ABSCESS

"A circumscribed collection of pus in a cavity, the result of an inflammation due to infection caused by pus-forming organisms. The pus burrows in the direction of least resistance and consequently the abscess may be either superficial or deep. Symptoms—a red swelling, a feeling of constant tension against the surrounding tissues, and a sharp tearing pain, when the place is bumped or pressed on." Treatment—refer the case to a physician. The procedure of the treatment is practically the same as for boils—lancing, evacuating the contents with a suction cup, and aseptisizing with iodine. When opened, an abscess must be drained since it tends to fill up again. Some iodized gauze placed in the opening of the wound will assure drainage. Under no circumstances should an abscess be squeezed, for there is danger of spreading the infection.

WIDESPREAD INFECTION

CELLULITIS

"A diffuse swelling of the skin characterized by read streaks which spread along the course of the neighboring blood vessels." Tenderness and pain are present. The lymphatic glands in the scrotum may become congested. The cause is generally some sort of irritation. Frequent removal of the tape may cause it. Treatment—the patient should be put to bed; apply hot fomentations or antiphlogestine to draw the infected material to one spot. Incise, bleed with suction cup, and keep aseptic with iodine and dry dressings. No exercise should be taken until the infection completely disappears. Cases of cellulitis should be referred to a physician.

SWOLLEN GLANDS

Lymphatic glands or nodes serve as sieves for the waste matter of the human body. Occasionally they are overwhelmed by an excess of the waste, due to the absorption of poisonous material, become inflamed, tender, painful, and swollen. The glands most commonly affected are those in the upper part of the thighs, close to the groin. Treatment—look for some infected suppurating wound on the side where the swollen gland is located. Boils, wounds or ulcers, if present, should be thoroughly cleansed and aseptisized. As soon as the cause is removed the gland will recover. Applying hot fomentations may relieve the tension and the pain, but may also result in the spreading of the septic material over the body. Surgeons suggest that the swollen glands be lanced and the contents evacuated. Constipation, overwork, and like causes which result in much waste matter being thrown into the system may cause enlarged glands.

UMBILICAL SUPPURATION

Rare—I have had but two cases. Matter oozes out of the umbilicus. Treat as any other infected wound—wash out with alcohol, paint with iodine, and apply a sterile gauze dressing.

IRRITATION OF SKIN DUE TO TAPING

Cause—Adhesive tape irritation. Symptoms—itching, and if the cause is not removed a rash may break out. Treatment—remove

the tape, wash the part with soap and water; follow by washing with grain alcohol and when the latter evaporates, rub Unguentine or zinc oxide ointment into the skin, and bandage with roller gauze. Repeat the procedure daily until the skin is completely healed. If the man is a football player and the taping of the ankle is an indispensability, use the Figure of Eight bandage consisting of four turns of roller gauze and one layer of adhesive. This bandage should be removed daily after practice.

An irritation of a similar character is sometimes produced as a result of massaging without a lubricant or with too much force. The hairs are pulled, the hair follicles become irritated and inflamed, and pimples appear. The treatment consists in aseptisizing with alcohol and rubbing with Unguentine. The part affected should not be massaged until the inflammation entirely disappears.

CONTUSION AND CONCUSSION OF THE BRAIN

Cause—Getting hit on the head. Common in football. Only a physician can determine the exact extent of the injury. Send for one if the case looks serious. Lay the patient on his back, the head slightly elevated. Remove all constrictions. Cover well with blankets, but keep the patient in a cool room. Wash his face with cold water and place a towel wrung out in cold water on his forehead and another cold towel across the front of the neck (to cover the carotid arteries). Ask a few test questions to determine the condition of the injured one. If his answers are rational, he may be expected to improve quickly. However, don't converse much with him; complete mental and physical relaxation is what he needs. If vomiting occurs, turn him face downward so as to prevent the danger of choking. Temporary unconsciousness may occur. Wipe his face with a cold towel and give him salts to smell. Headache may last for a few days. It would be advisable for the man to refrain from study for a day or two following such an injury. As a rule always send for a physician when such injuries occur.

SHOCK

Shock is a condition of more or less severe collapse due to mental and physical exhaustion brought on by a severe injury. Gameness and "bluff" which are characteristic of a vigorous athlete to a large degree, prevent shock. Very rarely severe internal

injuries involving some of the vital organs may result in the collapse of the athlete. The symptoms of shock are those of utter collapse—clammy and pale skin, shallow respiration, subnormal temperature, a rapid but very weak pulse, slight delirium, and in some cases partial unconsciousness. The treatment consists in assuring the patient absolute rest, providing artificial warmth by thoroughly covering the body and placing hot water bottles at the feet and at the sides of the patient. Hot coffee, or hot tea may be given as a stimulant. Be considerate in the treatment of a man's injury—do not be any rougher than you absolutely have to be.

FAINTING

Treatment of patient about to faint—lay him prone on his back, wash his face with cold water, and give him salts to smell. Still another way is to drop the head between the knees while sitting in a chair. Treatment of patient who has fainted—place the patient on his back, the head low, sprinkle cold water over the face and the chest. Loosen the clothes. Slap the chest over the region of the heart. Give him salts to smell. If there is a tendency to a recurrence of the attack, apply hot and cold fomentations alternately to the spine.

NAUSEA

May be due to fermenting food, extreme physical exertion, or nervousness. Treatment—one teaspoonful of aromatic spirits of ammonia and peppermint (prepared mixture) in a wine-glassful of water. Wash face in cold water. Have the patient lie down and place a cold towel on his forehead. Instruct him to breathe deeply.

HEADACHE

Headache is not an ailment in itself but is primarily a symptom of some other disorder. Four distinct varieties are to be distinguished:

1. **Congestive Headache**—Symptoms—flushed face, red eyes, bursting feeling, severe throbbing sensation, cold extremities. Treatment—the main object is to deplete the blood from the head. Apply heat to the extremities and the abdomen, and cold to the head. A hot sitz bath, keeping the feet in hot water, with a cold towel on

the head is a very effective remedy. Stroking massage, from center of forehead outward, will help.

2. **Anaemic Headache**—Patient pale, dizzy and has a gnawing, irritating pain. Treatment—object, of course, is to increase the blood supply to the head. A hot shower followed by a cold one and a full massage will help, by normalizing the circulation. A brisk two or three-mile walk is a sure cure. A hot fomentation on the forehead will relieve the pain.

3. **Sick or Splitting Headache**—Generally due to some digestive disorder. Symptoms—pain generally in the temples; patient sick at stomach; may vomit; has a “dopy” feeling. Treatment—remove the cause. Clean out the stomach and the bowels. Give hot water or hot lemonade to drink to clean the stomach and hot enema for the bowels. Hot packs to the abdomen or a hot sitz bath are beneficial. Hot or cold fomentation (whichever feels best) may be placed on the forehead.

4. **Nervous Headache**—Generally caused by eye strain or excessive mental excitement. The pain is steady, dull and boring. Treatment—remove the cause. Bathe the face in hot and cold water alternately. Rest in a dark room. Asperin tablets are a favorite headache remedy. I am strongly opposed to the use of asperin since it is “dope” and the use of it is very likely to become habitual. I have never failed to relieve a headache, and yet I have never used this drug.

ATHLETIC HEART

The heart is a muscular organ and as such falls under the rule that “function makes structure.” It follows that a man who makes more of a demand on the heart than the average will have a heart larger than the average. The physiological facts are that extreme demands on the heart cause hypertrophy (enlargement) of the heart muscle. Any muscle in the body grows proportionately to the extent of the use of it. If this development is gradual and has not brought about any organic lesions, then it is physiologically normal, simply a response on the part of the body to an increased demand. Hypertrophy of the heart, however, which is a normal condition, must be differentiated from dilatation of the heart which is a pathological condition. Hypertrophy is a growth, a develop-

ment; dilatation is a stretching, a weakening of the normal structure. Hypertrophy comes on gradually; dilatation suddenly as a result of over-exertion. The former means improved efficiency, the latter disease and weakness. Consequently in considering athletic injuries I can only discuss:

DILATATION OF THE HEART

In athletics the cause is generally over-exertion, resulting in an acute dilatation of either one of the auricles or one of the ventricles. The symptoms are—shortness of breath; palpitation of the heart, growing worse during competition; tenderness on pressure in the region of the heart; the man is easily fatigued and shows all symptoms of staleness, lack of appetite, constipation, tired feeling, etc. This condition can be cured with systematic, progressive exercises, milk diet, and clean hygienic habits. Such cases, if detected, should be referred to the medical adviser. Naturally, the athlete must give up training.

NOCTURNAL EMISSIONS

“Wet dreams,” involuntary emissions of semen at night. Serious only when occurring in too rapid succession—nightly or twice during the same night. Generally leaves the man in a weakened condition. Cause—full bladder, constipation, tight clothing, sleeping with closed windows, too heavy covering, etc. Treatment—remove the cause. Patient should eat plenty of fruit and vegetables to keep the bowels loose. He should desist from eating or drinking anything at night before going to sleep. He should sleep on the right side with the under leg drawn up, so that the genitals can rest on it, wear loose underclothing, and sleep under light covers. Cold sitz baths by invigorating the system will prevent recurrences. Occasionally an athlete reports having had two or three emissions the night preceding a contest. This is undoubtedly due to the high nervous tension under which the men labor. A cold plunge or a cold sitz bath of one minute's duration repeated about every three hours is sure to reinvigorate the man for the coming contest. I have used this method with unfailing success.

“STONE BRUISE”—“HEEL BRUISE”

Cause—hitting some hard object. The injury is very irritating, painful and bothersome. It generally occurs on the sole or

heel of the foot, and occasionally on the palm of the hand. It may be a bruise of the muscle, of the bone, or both. It is a "charley."

Treatment—bake the affected part or soak it in hot water. Massage derivatively. An antiphlogestine bandage applied overnight will hasten healing. A dressing of cottonwool saturated in glycerine, or a dressing of unguentine, will help soften the congested parts. Protect and rest the area involved by means of sponge rubber one-quarter inch thick, or a felt pad, cutting out a hole so as to remove all pressure from the sore spot. The hole may be filled with Unguentine. This injury should not be ignored since it is liable to incapacitate the athlete for some time.

The use of sponge rubber heels in track shoes is a preventive.

NOSE BLEED OR EPISTAXIS

Epistaxis or nose bleed may be caused by a blow, violent sneezing, etc., rupturing some of the small blood vessels in the nose. **Treatment**—lay the patient on his back, the head raised higher than the rest of the body, bring his arms overhead and keep them there. Apply ice, or cold packs to the nose and to the back of the neck. Bathe the face in hot water. Compress the nose with the fingers for a few minutes. If the bleeding persists in spite of all these measures, syringe the nostril with a five per cent solution of antipyrin.

VARICOSE VEINS

Cause—Failure of the valves and weakening of the walls of the veins with resultant dilatation. There may be bulgings along the course of the affected vein. The dilatation may so weaken the walls of the veins as to burst them and cause a hemorrhage.

Treatment—Treat as for hemorrhage, using a pad or a tourniquet (apply it below the site of the injury since it is the venous circulation which is involved). Prolonged cold fomentations are sure to prove helpful in reducing the local congestion. Refer to physician.

SUBCUTANEOUS HEMORRHAGES

Occasionally violence may cause a rupture of blood vessels without doing much other damage to neighboring tissues. In such

cases the dominating feature is a swelling fluctuating under the fingers. The immediate treatment is to immerse the part in cold water to stop further bleeding. Later immersion in hot water hastens removal of the effused blood. The elbow joint is the most common site of this type of injury.

"CHARLEY HORSE" (Muscle-Bone Bruise)

Cause—Violence. In a game occasions occur when a charging player, with muscles tense and arms and legs driving like powerful rams sails into another player who is temporarily relaxed, whether due to fatigue or the unexpectedness of the attack. The relaxed muscles are forcefully jammed against the underlying bone and we have a severe bruise of the muscles, bone, blood vessels, and often the nerves—in short, all the tissues intervening between the skin and the bone are more or less squashed. There is internal bleeding from the torn vessels. The injured muscle tissue coagulates, hardens the involved area and causes more or less immobility. Thus the characteristic symptom is a hard, painful congestion at some part of the muscle, radiating along its course.

Treatment—The main object is to increase the local circulation in order to carry off the extravasations, break up the coagulated mass, and hasten the reparatory process. As soon as the injury occurs apply hot fomentations for from one-half to one hour. Massage derivatively (around but not on the affected area, and toward the heart). Apply either an antiphlogestine dressing, hot fomentations, a hot water bottle, or an electric pad, or use the Thermo-lite—simply different forms of applying heat, aiming to keep up an active circulation. The electric pad or the hot water bottle may be applied over night. The next afternoon use hot packs and massage hard with "hot stuff." Protect with paper mache and send the man out. Keep using the limb. Rest or immobilization may cause the stiffness to persist. No man should stay out of practice on account of a "charley" unless it is a very severe one. Run signals if you can't do anything else but keep going. But—an effective protection is vital, since a second blow may do much harm and a few blows may leave permanent disability. Bridge over the injured part with paper mache padded on the sides with felt an inch thick. And when you apply the protection make sure it will stay put—use plenty of adhesive.

The possible result of an untreated "charley" is fibrosis and perhaps even ossification of the bruised area.

CRAMP OF MUSCLES

Cause—Overwork. The muscles suddenly contract—the whole side of the body may become temporarily paralyzed. Hard rubbing of the whole limb, combined with slapping and kneading manipulations will bring about a relaxation of the tense muscles. Grasping the belly of the muscle and squeezing with considerable force may prove effective in some cases. If the tenseness persists, hot fomentations or a hot bath should be given.

HERNIA OF MUSCLES

Cause—A "sudden contraction of the muscle bursting its sheath." This injury occurs occasionally among athletes but is not serious. **Diagnosis**—a slight swelling at some point along the course of the muscle which becomes small and hard when the muscle is tensed.

Treatment—If the injury is extensive, complete rest and taping, as for a ruptured muscle, is indicated. In milder cases, apply an antiphlogestine bandage overnight. Hot packs and light derivative massage should be used until the swelling disappears. Such injuries are not serious unless extensive.

"SHIN SPLINTS"

Cause—Overwork of the extensor muscle of the lower leg. **Symptoms**—dull pain and soreness, aggravated when the muscle is used. Pain radiates along the spine of the tibia.

Treatment—Complete rest for a day or two, depending on the severity of the case. Hot applications. Paint with iodine. Massage with "hot stuff," or iodine petrogen. Farradic or sinusoidal applications are helpful.

"WRY NECK"

Cause—Blow, sudden wrench or cold. Frequent among athletes. **Symptoms**—the neck muscles of one side tense and become painful. The patient is unable to turn or bend the head without pain.

Treatment—Apply hot fomentations to relax the affected muscles. Massage, at first gently, gradually making the manipulations more vigorous. Rub in some counter-irritant like "hot stuff." Protect with cottonwool from cold. Galvanic, farradic or sinusoidal currents are all of great help; so is mechanical vibration. If the above means fail to bring relief consult an osteopath or a chiropractor.

METATARSAL PAIN

Cause—A strain of the transverse ligaments which bind the metatarsal bones, due to a wrench or the wearing of tight shoes. **Symptoms**—pain between the metatarsal bones radiating to the toes. Swelling may be present.

Treatment—Remove the cause (change shoes). Soak the foot in hot water, and massage thoroughly. Pulling the toes forward and sideways may help.

WIND KNOCKED OUT

Cause—Violence. **Symptoms**—pale face, weakness, short, shallow breathing, and pain. If the pain persists suspect an injury to the abdominal organs, and refer the case to a physician.

Treatment—When the injury occurs during scrimmage or a contest, place the patient on his back, aid respiration by grasping the legs and flexing them on the chest; extend, and repeat the procedure. Raising arms overhead and bringing them forward downward to the sides of the chest is also effective. Rest, quiet, and plenty of air is essential. A dash of cold water, or washing face with cold water is effective. If the seat of the injury is painful apply an ice bag or cold applications.

If recovery is slow be on the alert for internal injury. In all cases of abdominal injury, if the patient does not recover promptly and shows persistent weakness, pallor, or pain, get a physician.

CONTUSION OF SCROTUM

Cause—Violence. Occasionally intentional, for example jumping with knee flexed in basketball. This injury occurs in scrimmage or a contest.

Treatment—Rest on back, knees drawn up. Raising the lower limbs high by grasping at knee joints lessens the congestion, relieving the patient. If the pain is severe, support the genitals. Apply cold fomentations or ice bag. If symptoms persist, suspect internal injury—call physician.

“GYM-ITCH”

Two types must be differentiated:

1. A dermatitis (skin inflammation), due to friction, failure to dry parts thoroughly, or excessive sweating.
2. Tinea Cruris—an irritation, due to a specific fungus which burrows into the skin. This form of gym itch is infectious and contagious. An attack, unless treated with vigor, is apt to persist for months. When it makes its appearance be careful to prevent spreading by keeping victim's equipment separate. Encourage frequent laundering of supporters.

Treatment—is the same for both types, except that in the case of Tinea Cruris it will have to be persisted in until all trace disappears.

Wash with medicated alcohol. Paint once with iodine. Dust daily with talcum powder. If persistent, rub in Unguentine or Ammoniated mercury ointment. Wash out daily with the alcohol and re-apply the ointment, since all ointments are apt to become rancid if left on too long and rancid fats are very irritating to the skin. Keep the parts thoroughly dry.

VERTEBRAL SUBLUXATIONS

Cause—Violence in football, basketball, etc., throwing the vertebrae partly out of their usual alignment with resultant pressure on the spinal nerves. These nerves, when interfered with and irritated, lessen the resistance and power of functioning of the parts of the body which they control. The symptoms are pain and soreness over the affected vertebrae.

Treatment—Subluxations along spine can be adjusted by placing two pillows under the patient so arranged that the part of the spine to be treated is bridged over these pillows (the patient lying face downward). Order the patient to relax completely.

Place one hand, palm down, parallel and close to the sore vertebrae and the other hand on the opposite side of the spine, also parallel and close to the affected vertebrae. Steadying yourself for an instant, give a short, quick thrust downward by suddenly stiffening the elbows. A distinct snap will be heard, indicating successful adjustment. After-soreness can be relieved with hot fomentations.

BLISTERS

Cause—Friction. The blisters may be filled with blood or serum.

Treatment—Puncture with sterilized needle. Press out the contents. Paint with tincture of benzoin to harden the skin. Protect with gauze and tape from further friction. Do not cut skin away—give the tender skin underneath a chance to harden. If, however, the matter squeezed out is pus, cut the blistered skin off and treat as any other infected wound—wash with alcohol, paint with iodine and apply a sterile gauze dressing. Infected blisters are common among athletes. Feet which have a tendency to blister should be toughened by painting with benzoin. Evacuated blisters should be protected from further friction, by placing strips of adhesive over them.

INFLAMMATION OF PERIOSTEUM OF BONE

Cause—Violence. Symptoms—swelling, redness, heat, pain which grows worse at night, tenderness. The pain is dull and boring. Use of limb uncomfortable. Refer such injuries to the medical adviser.

STITCH IN SIDE

Cause—Generally a collection of gases, products of fermentation of food, usually due to exercising too soon after eating. An athlete should not leave competition because of it. Breathing deeply and rubbing the affected part will give quick relief. In persistent cases apply hot fomentations. Circular rubbing and stroking of parts have proved effective.

TEETH

If bad, teeth should be treated by a dentist. Poor teeth are one of the chief causes of digestive disorders.

When sound teeth are knocked out as occasionally happens in athletics, replace them in their sockets as reattachment is possible. Send the man to a dentist and have him fasten the loosened teeth in place by wiring.

"WATER ON THE KNEE"

Cause—In athletics, violence, a blow, wrench, etc. We must differentiate two types:

1. **Bursitis**—Here the swelling, painful and tender, is circumscribed, giving the appearance of an inflated pouch projecting from the joint. A bursa (a cavity containing lubricating fluid, aiming to lessen friction and aid the gliding movements of tendons around a joint) is inflamed and becomes filled with fluid.

2. **Synovitis**—(The synovial cavity is formed by the membrane lining the joint articulating surface.) Here there is a more or less profuse effusion of blood and synovial (lubricating) fluid into the joint cavity, swelling the whole joint. Pain only on attempting to use the joint. This is the type of "water on the knee" we most often come in contact with. Bursitis is rare.

The effusion into the joint is aseptic and is therefore quickly absorbed if the joint is rested. Absolute rest for a day or two is imperative. Haste here will predispose to recurrence. The repeated swellings distend the joint, weaken the ligaments and the ultimate result is a weakened, "wobbly joint." Bitter experience has taught me that it is folly to be hasty with this injury. The longer you rest it, the more certain you are of absolute healing.

Symptoms—Swelling, hollows of the joint fill out. Palpation proves presence of effusion. Pain or tenderness may be present. Patient able to get around but feels insecure.

Treatment—Some cases respond quickly, others drag. The following routines of treatment are submitted in the order of their effectiveness:

(a) In mild cases apply hot and cold (alternate) fomentations; or give the joint a good baking out. Massage derivatively,

mostly stroking movements upward. Apply "Whitelock's bandage" (see under Bandaging) over night. Rest joint for from 1 to 3 days, depending on the severity of the case. Assure immobility by using splint. Continue baking, or hot and cold applications, and massage throughout the day, but allowing intervals of rest. Re-apply Whitelock's when not actively treating joint. Repeat the treatment prescribed daily. **The rest must be absolute, the patient going to bed.**

(b). In troublesome cases a plaster of Paris cast worn for three or four days assures complete immobilization and is an effective method of treatment.

(c) A very good method of treatment is a modification of Bier's Hyperemic treatment. Strap the thigh snugly with an elastic roller bandage so as to cause interference with the venous circulation. At the same time apply hot fomentations to the effected joint. A vigorous local circulation is set up as a result of which much of the effused material is carried off by the blood. Continue the treatment for an hour, remove the bandage and repeat in four hours. It may be followed by rubbing with chunks of ice. Over night apply Whitelock's bandages and remember that complete rest for a day or two is essential.

Though "water on the knee" should be treated promptly yet a mild case should not keep a man out of a contest. If he is needed, strengthen the knee with an elastic bandage, protect from blows, and use him.

INGROWN NAIL

Cause—Chiefly method of cutting the toe nails round. They should be cut straight across or if anything, the center hollowed out slightly so that the edges protrude.

Treatment of a mild case—Soak the toe in hot water. When the nail softens, raise the buried edge, paint with iodine, and place a strip of cottonwool or gauze smeared with Unguentine or with glycerine, between the buried edge and the skin. Change this application daily until the nail grows out or until the soreness disappears. "Strapping with adhesive may be so applied as to drag upon the overhanging integument and keep it pulled away from contact with the ingrowing edge." If the pressure has brought on

suppuration, then the case should be referred to the medical adviser who will remove the nail or the part of it which is causing the trouble.

FLAT-FOOT

Cause—Breaking down of the arches due to the weakening and stretching of the long and short plantar ligaments which brace them.

Treatment—There is too much of a tendency to give only temporary aid. Permanent cure should be insisted upon. It will call for some consistent application, but surely will be worth while.

Procedure of treatment—1. Passive exercises (given by operator, but can be entirely supplanted with active exercise); (a) flex foot; (b) extend foot; (c) bend foot to side, first to right, then to left; (d) circumduct foot. 2. Active exercises—(a) rise on toes; (b) walk on tip-toe; (c) walk on outer borders of feet; walk on heels; vigorously separate toes. In walking take care always to toe in. 3. Soak the feet in hot and cold water alternately. 4. Vigorously massage the feet. 5. Support weakened arches during the training season by placing a felt pad under them. These pads should be changed daily. 6. Mechanical supports should be worn only temporarily and during the acute stages. Specialists condemn mechanical supports and rely on strapping with adhesive to give temporary relief and support.

WEAK OR WOBBLY JOINTS

Cause—Stretching or partial or complete rupture of the ligaments, due to sprains or dislocations, which allow the joint a great deal of abnormal mobility.

Radical treatment—Operation to shorten the elongated ligaments or to affect a union of the ruptured ones.

Conservative treatment—Use hot and cold fomentations (whenever strengthening is the object, use more cold applications than hot), massage and resistive exercises—the operator resisting by pushing while the patient tries to extend the flexed limb, and resisting by pulling while the patient tries to flex the limb. The theory is that a demand being made on the body, the latter will respond by strengthening the ligaments of the weakened joints.

During the last few years I have had quite a number of cases of “wobbly” joints referred to me by coaches anxious to retain the services of good “prospects.” My usual routine is to make sure just what ligaments are involved and prescribe a series of exercises involving these. Thus suppose the lateral knee ligaments are involved. Any number of knee exercises are available. Persistence in taking these exercises is sure to bring the desired result, although we must recognize that there are hopeless cases.

WEAK WRIST

Cause—Stretching of the annular ligament of the wrist.

Treatment—Persistent, active exercise, such as flexing the wrist, flexing and extending the fingers, resistive movements, etc., are sure to remedy this condition.

STALENESS

Cause—Reporting in poor condition; reporting “too fine”; overwork; overeating; constipation; indigestion; mal-nourishment (eating wrong kind of food); under-nourishment; dissipation; loss of sleep; worry; monotonous routine of training; depression.

Symptoms—First characteristic sign is loss of weight; listlessness; lack of interest in training work; face drawn, pinched; becomes “temperamental,” peevish, irritable; loses appetite; sleeps poorly; “all in;” tires easily; lacks driving power; easily injured; injuries slow in healing, etc.

Prevention—Anticipate by keeping eye on daily weight record. Avoid overworking men. Hold men in check at start of season when they are apt to overwork. Learn to judge the condition of your men by their general appearance.

Treatment—Lay man off for a few days. In mild cases it is not necessary to stop training entirely—just ease off. He should eat pure, easily digestible, wholesome food, and take long walks in the open air. Plenty of sleep is essential. Give the man daily a full body massage followed by a percussion douche (see Hydrotherapy) and a cold sitz bath. Massage with warm olive oil, paying special attention to the abdomen and spine. A vibratory treatment is helpful.

UNDER AND OVERWEIGHT

As a rule the general training routine tends to normalize weight—reducing the fat, building up the lean. Radical measures of reducing weight must be carried out with care. Growing boys should not be forced to undergo any severe regime tending to reduce weight.

METHODS OF "REDUCING"

1. **Diet**—Probably the most important factor. Persistent gorging will nullify all efforts to get rid of fat. Therefore limit the amount of food intake to minimum. It is an error to cut out this or that article of food. Eat the food combinations you have been accustomed to, but in lessened amount. Eliminating starch foods may lead to hyper-acidity and other disturbances of digestion.

2. **Increasing amount of exercise**—Effective, but don't go to extremes. Don't try to effect a reduction too rapidly. Slowly but surely. Rapid loss of weight is injurious.

3. **The wearing of gum rubber shirts**, or heavy sweat shirts—both are worn to increase sweating during exercise.

4. **Steam baths**—Useful within limits. Should not be taken oftener than three times a week. Sweat baths "reduce" but leave patient exhausted, which is hardly desirable for an athlete.

5. **Limit sleep** to eight hours—and no lying around in bed on waking.

6. **Massage**—A good hard massage will burn up a lot of adipose.

METHODS OF GAINING WEIGHT

1. **Diet**—Assure good food and plenty of it. If the athlete is in active training, is not being overworked and yet persistently loses weight he is probably eating the wrong kind of food or his digestive organs are not functioning properly. Find the cause and remedy it. Induce the man to drink a pint or more of milk at about 9 p. m. Let him sip the milk slowly and if he chooses he may have some raisins, figs, or prunes with the milk. I have used

this routine for a number of years and have been uniformly successful in building up "skinnies."

2. **Sleep**—The more the better. Lean people are as a rule of very nervous temperament and during the day are so much on the go that they burn up most of their intake. Sleep time is their building time.

3. **The amount of exercise must be regulated**—The nervousness characteristic of the "lean" leads them to overwork. Hold them in check.

4. **Massage**—Aim to increase the circulation and stimulate the abdominal organs and the spinal column. A full body massage with olive oil, using limited force, paying most attention to spine and abdomen, and followed by a percussion douche and sitz bath is a stimulating treatment sure to net desired results. (See under Massage and Hydrotherapy.)

6. **Hikes**—Five-mile hikes are great stimulants to the circulation, digestion, and in fact to the whole functioning apparatus of the body.

STIFFNESS OF MUSCLES

Cause—An excessive accumulation of products of fatigue in the blood, due to strenuous exercise and inability of the circulation to remove this morbid material. This condition is rather common among athletes at the start of a training season. Do not allow the man to "lay off" on account of stiffness.

Treatment—Object is to help the body to eliminate the waste and establish an equilibrium of the circulation. Instruct the man to take a hot half bath or a hot full bath for about twenty minutes, followed by a short cold bath. A good massage and a vibratory treatment will prove effective. If the stiffness persists give a steam or electric bath followed by either a cold shower, or a percussion douche and a brisk rub. As a general rule, hot water never fails to relieve this condition.

CHILLS

Cause—Exposure to cold or wet.

Treatment—Give a steam bath or a hot shower. Put to bed, cover with blankets. Use a warm enema to clean out the bowels.

Give hot lemonade to drink. When an athlete complains of a chill, attend to it at once, since it may turn into a cold, tonsilitis, etc.

VOMITING

Cause—In athletes, the presence of indigestible food in the stomach, aggravated by extreme physical exertion. This trouble is not unusual among trackmen or swimmers.

Treatment—Encourage at first, for getting rid of the irritating matter is bound to prove beneficial. To stop vomiting, have patient suck small lumps of ice or drink half a glassful of cold water. If persistent, apply hot fomentations to the abdomen.

HARDENING THE SKIN

The best method we have used to harden the skin is to soak the feet in cold salt water, dry thoroughly and then paint them with tincture of benzoin.

The following astringents are all effective in hardening tender skin:

Tannic acid—tablespoonful to a quart of water.

Glycerite of Tannin.

Alum—a teaspoonful to a pint of water.

Formaldehyde—1% solution.

HEAT EXHAUSTION

Occurs occasionally among athletes. Diagnosis—must be differentiated from sunstroke.

Heat exhaustion—Face pale, patient weak, dazed, prostrated, not unconscious, skin cool, breathing noisy.

Sunstroke—Face flushed, patient unconscious, skin dry and burning, breathing rapid and shallow.

Treatment: **Heat exhaustion**—Rest quiet, plenty of air, cover the man with blankets, apply heat to the extremities, give hot tea or cocoa as a stimulant. **Sunstroke**—Cold bath, ice to the head, cold enema, heat to feet.

SOFT CORN

Cause—Friction, uncleanness, or failure to dry oneself thoroughly. Occurs generally between the toes.

Treatment—Scrape off the loose dead tissue. Paint the corn with silver nitrate. Keep the toes apart by placing cottonwool saturated in Unguentine or glycerine, between them. The corn will dry, become hard and black. Remove as much of the blackened cuticle as possible by scraping with a dull knife, and repeat the procedure until the corn entirely disappears.

CORNS (HARD)

Cause—Pressure.

Treatment—Remove cause. "Prevent the development of the corn by removing the hardened cuticle as it is formed. Soak the feet in hot water once or twice a day. Then apply to the center of the core a little acetic acid. When the hardened skin softens, scrape away with a dull knife. Protect the spot with corn plaster. Do not wear tight boots." Touching the corn with a drop of salicylic acid and protecting from further pressure is another effective remedy.

BURNS

Occur occasionally in training quarters. Cases are generally mild.

Treatment—Apply an ointment or olive oil at once. Cover to exclude the air. Bad burns should be treated by a physician. Sodium bicarbonate (baking soda) makes a fine application. A dry dressing of boracic acid or zinc oxide, covered with cottonwool to keep the air out will prove efficient.

SWEATY FEET

Wash thoroughly every night with soap and water. Finish with cold water. Paint with tincture of benzoin. Keep the feet thoroughly dry. Washing the feet in a two per cent solution of formalin is frequently recommended by physicians as an effective remedy for this complaint.

RINGWORM

Paint daily with iodine until cured. A mixture of collodion and salicylic acid is popular with army physicians for the treatment of ringworm.

CHAPPED LIPS

Apply cold cream or vaseline nightly before going to sleep until cured. Warn not to lick the lips.

BUNIONS

Cause—"Inflammation and swelling of the bursal sac which lies at the inside of the ball of the great toe."

Treatment—Remove the cause (generally pressure). When acute, soak the foot in hot water, followed with cold. Hot and cold applications applied daily for a few weeks will remedy the condition (providing the pressure is removed).

FINGER CRACKS

Generally caused by constant friction or exposure to winds. Rub the affected part with glycerine or any mild ointment. Wearing a rubber cap will often soften the parts.

CALLOUSES

Cause—Constant pressure or friction.

Treatment—Soak the affected part in hot water, or still better, in hot washing soda solution. Paint with iodine to asepticize. Shave the thickened skin with a sharp lancet—if you are handy and careful with surgical instruments. If a beginner, scrape with a dull knife.

Wash with alcohol. Painting with 20% solution of salicylic acid in collodion, or 20% Salicylic acid ointment is very effective in softening the callous.

FROST BITE

On very cold days the fingers, ears, or parts of the face of a football player may be nipped by the frost. In restoring the part be careful to warm it gradually. Increase the local circulation by

gently rubbing with snow or cold water. Follow with applications of warm cloths, and finally soak the part in hot water. The habit of soaking a frozen part in cold water is foolish and harmful. To prevent a re-attack the part may be painted with iodine or some "hot stuff" and otherwise protected from the cold.

CHAPTER X

Common Ailments

APPENDICITIS (ACUTE)

An acute inflammation of appendix. Exact cause disputable. Constipation predisposing factor. The inflammation may involve surrounding tissues.

Symptoms—Prostration. Patient on back, knees drawn up, severe stabbing pain in region where appendix is located (right groin), local tenderness; nausea, vomiting, fever, rapid pulse.

Means of prevention—Care in diet. Guard against constipation.

First aid—Ice packs to pain area. Absolute rest. No food. Under no circumstances should a laxative be given. Send for a physician.

BILLIOUSNESS

Torpidity of the Liver—A congestion of the liver due to improper dieting, lack of activity plus over-eating, digestive disorders, etc. The whole digestive apparatus is torpid, sluggish; there is jaundice, lack of appetite, depression, lassitude, and headache.

Means of prevention—Proper diet, regular exercise.

First Aid (in acute attacks)—Hot enema to cleanse bowels. A tablespoonful of Epsom salts in a glassful of water as a purgative. Instruct patient to drink large quantities of hot lemonade, only slightly sweetened. Give a hot bath or a steam bath followed by a full body massage. Regulate diet. Increase quantity of fruit and green vegetables eaten.

COLD

An inflammation of the nasal and air passages, characterized by a more or less profuse discharge of thick mucous; headache, lassitude, pains and aches all over the body; the symptoms vary great-

ly and it is hardly necessary to list them since we are all familiar with the common features of a "cold." Various germs are blamed for this ailment, but an important predisposing cause is a lowered body resistance. Thus an athlete on the verge of staleness is a fine host for the germ. Men who keep their bodies clean and their vitality high are immune from colds.

Take all colds seriously. Attack them with vigor. Early and effective treatment will "break up" a cold with comparative ease. Give it a start and you may pay dearly.

Treatment—Elimination by all possible means. Hot enema. Epsom salts. Steam bath followed by a full body massage, then sleep. Limited diet for a few days. Encourage drinking of large quantities of hot lemonade to flush out the body. To loosen the congestion in the nasal passages use an antiseptic spray, or apply argyrol (10%) with dropper; or you may use mentholated vaseline. To relieve the congestion in the air passages, inhale steam, drink hot lemonade.

Preventive measures—Eat less and exercise more. Keep the bowels open. Sleep in well ventilated rooms. Do not expose yourself unnecessarily and keep away from those who have colds. If you have a cold protect everybody else by keeping away from them.

CONSTIPATION

Cause—Overeating; hasty eating; eating too refined food; eating pastry in excess; irregularity of meals; exercise too soon after eating; chronic use of laxatives; neglect to eat sufficient coarse food; lack of exercise; weakness of the abdominal muscles; failure to answer nature's call; failure to establish regular hours for the evacuation of the bowels; insufficient liquid.

Treatment—Find the cause and remove it. Teach moderation in eating. Assure supply of coarse food, such as whole wheat or bran bread, green vegetables, dried fruit, especially figs, raisins, and prunes; give exercise to build up the abdominal muscles; instruct not to exercise after meals; encourage long distance hikes; the patient should form the habit of going to stool every morning either before or after breakfast. He should be warned not to strain at stools. Straining causes "piles" and weakens the surrounding muscles so they lose the power of proper contraction. Warn

against the habitual use of laxatives. In acute cases an enema will prove a quicker and more effective remedy.

For chronic constipation the following may be recommended:

Agar-Agar, a Japanese sea-weed. It is absolutely odorless and tasteless. It absorbs water like a sponge and aids in keeping the contents of the intestines moist. It also provides bulk which serves as a stimulant to peristalsis. It is indigestible. **Dose**—One tablespoonful to a meal. Can be taken with soup or in fruit juices. Patient should drink plenty of water.

Russian or Domestic Mineral Oil—There are many grades on the market, and they are all of about the same quality. The oil which is tasteless and odorless serves to lubricate the intestines and to keep the contents soft. It is indigestible and unabsorbable, leaving the body as it enters. The action of both, Agar-Agar and the oil is purely mechanical. The efficacy of both has been repeatedly demonstrated.

Massage of the abdomen is another efficient measure for the relief of constipation. If you have an athlete who is chronically constipated give him an abdominal massage daily. Acute constipation may be relieved with an enema, tablespoonful of Epsom salts, or with two C. C. pills (see supplies).

COUGH

A cough is not an ailment in itself, but a symptom of some other disorder, such as irritation of the bronchial tubes most generally. If a cold is present treat the cold and the cough will disappear. Inhaling steam or the fumes of tincture of benzoin, or the copious drinking of hot water aid in relieving a cough. Gargling a syrup made of strained honey in a glassful of hot water is an effective remedy.

DIARRHOEA

Diarrhoea is generally caused by the presence of indigestible or putrifying food in the intestines. The toxins produced irritate the walls of the intestines, inducing cramps. At first no effort should be made to stop the diarrhoea, since the evacuation of the poisonous matter from the bowels is bound to prove beneficial. To hasten the removal of the irritating substance give a hot enema

and a dose of Epsom salts. The patient should fast for a day or two.

In athletics we frequently find cases of "nervous" diarrhoea. The probable cause is indigestion and consequent putrefaction due to extreme nervousness on the part of the athlete. It usually occurs on the day of a contest. If slight, ignore. If persistent, give a warm enema to cleanse bowels. Follow with a cold enema to restore tone. A cold sitz bath will further arrest the diarrhoea and restore pep. Paregoric is of little value. Use it for lack of any other effective remedy.

DIPHTHERIA

A highly contagious disease characterized by soreness of the throat, difficulty in swallowing, headache, lassitude, high fever, and a grayish membrane covering the tonsils. All sore throat cases should be referred to the team physician for examination.

ACUTE INDIGESTION

Magnesium oxide is preferable to Sodium Bicarbonate as a remedy. In a pinch the latter will do. Hot water with a few drops of Oil of Peppermint helps in some cases. Encourage belching during attack.

After treatment—A disordered digestion is inimical to effective athletic efforts. To restore normality, place the athlete on a milk diet for a few days—a pint of milk every three hours. To prevent constipation add some dried sweet fruit, such as raisins or figs. In the meantime clean out the body thoroughly. Use enema, salts, baths, massage, and large quantities of hot water to drink.

LIBERTY OR EX-GERMAN MEASLES

A mild contagious affection characterized by the appearance of rose-colored spots on the face, gradually spreading down the body. The lymph glands back of the ears swell. There is a slight soreness of the throat and the eyes are inflamed and watery. Like most of the eruptive diseases, German measles is self-limiting, disappearing in three to four days. The only treatment indicated is washing the eyes with a warm boric acid solution. Daily warm

baths followed by a cold one and keeping the bowels open will hasten recovery.

HAEMORRHOIDS

Cause—Chronic constipation and straining at stool. The veins in the rectum become dilated (varicose) ultimately rupturing and bleeding. The pain and sensitiveness in the affected region may be acute. The object of the treatment is to remove the cause and to invigorate the weakened blood vessels. Prescribe treatment for the constipation. Patient should make a habit of taking daily sitz baths. Astringent suppositories are helpful.

BRIGHT'S DISEASE

A congestion and inflammation of the kidneys. May be either acute or chronic and is due to the wear and tear on the organs caused by the necessity of eliminating all sorts of toxins produced in the body. The main symptom is the presence of albumen in the urine. The urine is dark in color and may even contain blood. Pain over the kidneys if persistent should make one wary. Refer the case to a medical adviser.

MEASLES

A self-limiting contagious disease characterized by lassitude, high fever, chilliness, ache in the muscles and bones, inflamed eyes, and a catarrh of the nose. There is a crimson colored pimply rash which starts on the face and soon spreads all over the body.

MUMPS

An inflammation of the salivary glands characterized by swelling at the angles of the lower jaw bone, a high fever, lassitude, and a headache. The infection may travel down into the testicles. The ailment is contagious. The treatment consists of absolute rest and the patient must be isolated.

NASAL CATARRH

Indicates congestion of waste matter in the body. Stimulate the excretory organs. Give a dose of Epsom salts or a hot enema, to cleanse bowels and a hot steam bath to increase perspiration. The

use of an antiseptic spray; argyrol; mentholated vaseline, or inhalation of steam all aid in relieving the congestion.

PLEURISY

Is an inflammation of the serous membrane which covers the lungs (the pleura). The usual predisposing cause is exposure when the bodily vitality is at a low ebb. The most prominent symptom is a severe stabbing pain under the shoulder blade.

PNEUMONIA

An acute inflammation of one or both lungs. A germ is the activating cause. Lowered resistance and exposure are predisposing causes. The symptoms come on with characteristic suddenness: violent chill, fever, stabbing pain, prostration.

ACUTE ARTICULAR RHEUMATISM (RHEUMATIC FEVER)

Cause—Unknown virus. Diseased tonsils and decayed teeth are thought to be breeding places for the germ. Symptoms vary with severity of attack: pain, fever, inflammation and swelling of joints, prostration. The attack is generally self-limiting (two to three weeks), but serious complications are common, the heart being especially liable to become involved.

RUPTURE (HERNIA)

Protrusion of a part of the abdominal contents through a rent in the membranes enclosing the abdominal cavity. Congenital weakness, severe exertions, etc., are the usual causes. Symptoms vary with extent of tear and protrusion: dragginess, pain, external bulging. In athletics most common at sides of scrotum. Careful examination by competent physician can determine whether the hernia can be remedied with corrective exercises aiming to restore the strength of the weakened membrane, or whether an operation alone will bring relief. The operation is a comparatively easy one. The wearing of a truss is of temporary aid.

SCARLET FEVER

An acute infectious disease characterized by a very high fever, inflamed throat, vomiting, and within twenty-four hours after the appearance of the initial symptoms, the breaking out of a fine scarlet rash which runs so close together that the body appears as if covered with one solid mass of eruptions. The disease is self-limiting but complications are common.

SCIATICA

Sciatica is an inflammation of the sciatic nerve. There is a sharp stabbing pain radiating along the course of the nerve trunk. Consult an osteopath. Hot packs will temporarily relieve the pain and stretching exercises will aid in curing the ailment.

SMALLPOX

A very contagious disease characterized by a high fever, vomiting, prostration, headache, radiating muscular pains, a flushed face and a darkish red rash, which quickly covers the whole body.

SYPHILIS

Two to six weeks following exposure "hard chancre" appears on genitals or lips, etc. The chancre is usually ulcerated and on palpation shows presence of a hard base. For one limited in experience a chancre is indistinguishable from a common ulcer. Look with suspicion on every "sore" or hard "nodule" noted on the genitals or lips. Don't forget we are dealing with young people. Refer to physician.

GONORRHEA

Symptoms of diagnostic value: two to eight days after exposure patient notes persistent itching, followed by burning pain on passing urine and a mucoid discharge which gradually thickens in consistency. Immediately refer case to physician. Forbid use of gymnasium.

TONSILITIS

An inflammation of one or both tonsils, varying in type and severity.

A. Acute Superficial Tonsilitis—Slight, little swelling, slight pain, swallowing difficult.

Treatment—Give treatment prescribed for "Colds," since this form of tonsilitis is a form of "cold." Gargle with warm salt water, or Dobell's solution.

B. Acute Follicular Tonsilitis—Inflammation extensive, much swelling, redness, pain and difficulty in swallowing. There is fever and the neighboring glands are swollen.

Treatment—As for A. Put patient to bed. Inhale steam containing vapors of Compound Tr. of Benzoin.

There are other less common forms rarely met with in athletics. Tonsilitis is rather frequent among athletes and it behooves the trainer to have the treatment down pat and go at a case with vim. Ignoring a case may mean an epidemic of sore throats, especially if the team is temporarily stale.

INFLUENZA

An acute contagious disease with symptoms of a very bad cold.

There is a high fever, pains in the muscles and the bones, an inflamed throat, prostration, and mental depression.

Treatment—Give a hot steam bath, a hot enema, a laxative, have patient drink large quantities of hot lemonade (as hot as the patient can bear), limit diet, and prescribe absolute rest for a day. Take the "flu" very seriously. In itself it is not dangerous, but it predisposes to very severe attacks of pneumonia. In the treatment of influenza proper care and whole-hearted nursing is of greater importance than medicinal aid.

CHAPTER XI

SUPPLIES

In this chapter I intend to consider the various chemical substances and surgical materials which we use in training.

Alcohol—Principally used to wash out wounds, but alcohol 75 per cent strong makes an effective antiseptic. It is widely used by surgeons for the sterilization of surgical instruments. Alcohol has the property of dissolving fatty matter, so that the iodine application following can come into immediate contact with the carriers of infection. Alcohol in various degrees of solution is used for liniments and as "rub-down stuff." It must be noted that the application of alcohol to the skin induces a loss of bodily heat through evaporation. It follows that if the bodily temperature of a patient is low, or if the patient is chilled, application of alcohol is likely to do harm. Prohibition makes it impossible to obtain the pure grain alcohol, but for our purposes the medicated alcohol sold under various patent names is just as good. Medicated alcohol is at least 90 per cent pure grain alcohol. The adulterant added is harmful only to parched throats and starved stomachs.

Hydrogen Peroxide—The popularity of this antiseptic is fast waning. In my six months in the army I have never seen any physician use peroxide. Its antiseptic and bactericidal powers are negligible. Its best use is for the destruction of pus cocci, only when the latter are found superficially. Peroxide should not be poured into cavities, since the oxidized pus material becomes a toxin which retained in the wound may become a source of grave infection. Use only for superficial pus formations.

Boric Acid—A mild antiseptic, useful for allaying irritation of very sensitive organs such as the ear and the eye. Solution, four ounces to a quart of boiling water. Dry boracic acid makes a good application for burns or blisters due to excessive heat applications.

Bichloride of Mercury—Is a very strong germicide. In fact its strength is such that it may attack the tissues of the body exposed

to it. One thousandth, or one two-thousandth solution may be used on wounds having a tendency to fester, or which have been exposed to a source of infection.

Iodine—Is still the royal antiseptic and counter-irritant for the trainer's needs. It rarely fails. Until sufficient proof is found that the new antiseptics are all they are claimed to be iodine should be preferred to all others for antiseptic purposes. Some people are susceptible to iodine and cannot have it applied without showing signs of iodine poisoning. At any rate, "surface covered by iodine should not exceed the width of the two hands." To remove iodine stains wash with sodium hyposulphite. Do not coat too heavily.

Iodoform—or any other powdered iodine preparation is of no particular value to the trainer. Its action depends mainly on the liberation of the iodine it contains. Avoid the use of such drying powders. A wound drying too fast is apt to fester.

Carbolic Acid—A five per cent solution makes a very strong antiseptic and certain bactericide. But, like the bichloride of mercury, it is so strong in its action that frequent applications may prove injurious to the tissues. For that reason its use is generally discouraged.

Avoid the use of Carbolic acid. In athletics, the only occasion when you are justified in using it, is to paint a persistently festering wound or ulcer. And then immediately wash the wound with grain alcohol to remove the Phenol. All you try for is the instantaneous effect. Under no circumstances should you ever apply a wet dressing containing carbolic acid. Gangrene (death of tissue) and loss of limb is almost a sure consequence.

Collodion—Antiseptic and protective. Good for small wounds.

Tincture of Benzoin—A resinous balsam, antiseptic, protective and astringent. On drying it forms a water-proof covering over a wound. Used chiefly for toughening skin, especially of the feet. Mixed with water and a little resin it makes an effective "anti-fumble" application for hands. Alcohol is a good astringent and since the Tr. of Benzoin contains about 80 per cent alcohol, the combination nets a very efficient skin "toughener."

Compound Tincture of Benzoin—Is not as good an astringent as the plain Tincture. It contains various medicinal substances

and is used to allay inflammation and irritation of the air passages, such as occur in colds, cough, tonsilitis. Place a teaspoonful to a pint of water in a kettle. The mixture is brought to a boil and when the steam containing the vapors of the Compound begins to come off the patient is instructed to inhale it. Repeat treatment every three hours to permanent relief.

Tannic acid—Effective astringent. Tablespoonful to quart of water.

Alum—Effective astringent. Teaspoonful in pint of water.

Formalin—1 per cent solution hardens skin effectively.

Unguentine—Is a patented preparation and as a rule it is not considered good taste to recommend patent medicines. But here is an ointment that has done some very effective service and it is no more than fair to admit it. A fact of interest is that the formula of the ointment is printed on the container, the producers apparently having no fear of imitators.

Unguentine comes in handy in a hundred and one ways. It is antiseptic, hygroscopic, stimulates healing, prevents festering, soothes, allays irritation—in short it is very useful. It is to be preferred to zinc oxide ointment. Balsam of Peru is popular with some physicians but the Pharmacopea will tell you that it is a rather weak antiseptic ointment.

Glycerine—Is hygroscopic in character and serves to excite the secretion of fluids. It is generally applied to suppurating wounds to draw out the contents.

Talcum Powder—To allay irritation and tenderness due to friction or excessive sweating.

Sodium Bicarbonate and Picric Acid—A small quantity of both should be kept on hand for the treatment of burns, which are fortunately rare around training quarters. Sodium Bicarbonate or Magnesium Oxide relieve "heart burn."

Aspirin—Is an acetyl of salicylic acid—a popular remedy for headaches.

Smelling Salts—Cottonwool saturated in spirits of ammonia—helpful in cases of fainting or semi-consciousness.

Aromatic Spirits of Ammonia and Peppermint—For a sick stomach. Dose—One teaspoonful in a wine-glassful of water.

Epsom Salts—Saturated solution. An effective remedy for acute attacks of constipation. Dose—Tablespoonful in glassful of water, to be taken on arising in the morning.

C. C. Pills—Compound cathartic pills, helpful in relieving acute attacks of constipation.

Salicylic Acid—Useful for removing hard corns. Salicylic acid ointment is used in treatment of callouses.

Ethyl Chloride—A local anaesthetic used in the form of a spray.

Lunar Caustic—Sold in pencil form, useful for treatment of soft corns.

A. W. G. Mixture—An antiseptic, antiphlogistic, hygroscopic mixture, composed of one part alcohol, two parts witch hazel, and one part glycerine, "limits swelling, subcutaneous oozing, allays pain, favors drainage, and promotes absorption of effusion." Saturate cottonwool and apply as a dressing to the wound or bruise.

Antiphlogestine—Useful for relieving inflammation and congestion. It is a complicated chemical compound, the base of which is clay. The clay retains the heat; the glycerine it contains has antiphlogistic (drawing) power and iodine, the other constituent serves as a counter-irritant. It is extensively used in the treatment of injuries. The different methods of application will be found under "Bandages." Have a spatula for spreading the clay, also oil paper to cover it.

Benzine or Gasoline—Used to wash off adhesive plaster.

Liniment Ingredients:

For "Hot Stuff"

Chloroform water
Ammonia Water
Camphorated Oil
Oil of Wintergreen
Oil of Eucalyptus
Oil of Mustard

For "Rub-Down"

Medicated Grain Alcohol
Witch Hazel
Oil of Wintergreen to "spice"
Soap Liniment

Mineral Oil—Odorless, is used as a base for oil liniments.

Soap Liniment—Makes an effective base for rub-down liniments.

Massage Lubricants:

Olive oil—Warm olive oil is soothing. Also used as food tonic for run-down athletes.

Cocoa butter—Pleasant to handle.

Mineral oil—Odorless—serves the purpose well.

Cold Cream—Preferred by many masseurs. Bath to follow.

Cocoonut Butter—Odorless. Fine lubricant.

Adhesive Tape—For general first aid work buy adhesive in rolls 12 inches wide, 5 yards long. This will mean a great saving. For strapping ankles I have favored 2 inches wide by 10 yards long. Many big schools buy only the 5 x 12 and cut strips of desired width. If the adhesive is dry put it on the radiator. Adhesive does not deteriorate rapidly. Government adhesive made in 1918 is still going strong.

Cottonwool—Sterile. Buy it in 1-pound cartons.

Roller Gauze Bandaging—Two and three-inch widths. If you need one-inch width cut the two-inch in half with a sharp knife.

Sterile Gauze—Five-yard cartons.

Ankle Roller Bandages—Made of cotton flannel, muslin, or weaved cotton. Two and one-half inches wide by 8 feet long. Wash before using to remove starch.

Elastic Bandages—The "ACE" bandage is the best in the market.

Rubber Elastic Bandages—Two inches wide by 5 yards long come in handy.

Pure Para Rubber Bandages—Two or 3 inches wide, 9 to 12 feet long. Quite useful around the training quarters.

Felt, sponge rubber, vulcanized fibre, aluminum, sheepskin, rubber sponges, shoe leather—are used for protections. (See under Protections.)

Powdered Rosin—Is absolutely indispensable to prevent fumbling. Use plenty of it on wet days. On warm days prevent hands from getting sweaty and slippery. Keep it in shaker cans.

Weight Cards—Make them or buy them, but be sure to have them. Have spaces for recording weight "going out" and "coming in."

Small Bath Sponges—For the sponge baths.

Sea Salt—For salt sponging.

Corn Plasters.

Hot Water Bottles—Two or three should be taken along on trips since injuries after a game can be treated on the train while homeward bound.

Electric Heating Pads.

Flannel Packs—Useful for the application of hot fomentations. Saves the towels.

Ice bag, enema bag.

Gallon size Thermos Bottle—For the hot drink between halves.

Spray—For nasal or throat work.

Surgical Dressing Scissors—5½ inches. *Tear*

Surgical Bandage Scissors—6 inches. *San*

Surgical Tweezers.

Lancet.

Bier's Suction Cup for draining of infected cavities.

Hot Air or Steam Cabinet—A portable outfit can be obtained from any drug supply house for about five dollars. A complete training room should possess an electric cabinet bath. I bought one for Illinois in 1916 for about \$200. It has given a world of effective service and is still going strong. Any money invested in training room equipment will draw large dividends by assuring continued service of much needed men.

Electric Vibrator—Unless you can buy a good one (cost about \$45) don't buy it at all. The cheaper makes lack penetrative power.

Baker—For treatment of injuries. Indispensable.

Electro-therapeutic Outfit—Choose one that combines the galvanic, faradic and sinusoidal currents.

High Frequency Outfit—Lots of sparks, little effect. Waste of money to buy one unless for skin diseases.

Thermolite—By all means have one or more on hand in the training quarters.

Trainer's First Aid Field Handbag—Comes in pretty handy.

CHAPTER XII

HINTS AND GLINTS

No trainer knows so much that he cannot afford to know more.

Don't rest on your laurels. Life is a race, and if you slow up or stop some one is sure to pass you. There is a long line back of you eager to go ahead. Superiority is the determining factor. The only way to stay in front is to be better than those who are following you. Keep driving ahead. The trainer who thinks he knows it all is on the express train running to "Oblivion."

The trainer should be ever on the alert for new discoveries and suggestions which may help to increase his efficiency.

To turn one's back on a good thing because it is new, is a very ancient way of doing a thing wrong.

I believe an M. D. should utilize the principles of osteopathy, chiropractic, naturopathy, and all other "opathies" (providing they are of value) in his practice. I do not believe in belonging to a "school." One should be a physician, a dispenser of health, not a cult adherent.

It is generally agreed among trainers that the least medicine we use in athletics the better. "Doping a man" to make him well is a maxim of the past.

"The co-operation of the patients is of the utmost importance. They must be active participants in the work of their own salvation."

"Humbug is justifiable when it is in the interest of the patient."

Give your assistants credit for what they do.

"A long and careful training always gives better results than a short, severe one."

"The training must be varied according to the physique of the individual."

"Mental alertness is a vital factor in athletics. There can be no mental alertness without corresponding physical vigor."

One of the biggest crimes in athletics is misuse of an athlete, especially of immature age.

To say that athletic teams have made good showings without pre-seasonal conditioning is a mighty poor argument. What would they have done if they had been in good condition?

When you get a new idea talk it over with your coaches. They are men of experience, and their opinion is sure to prove valuable.

Always see that the visiting team is treated royally. The spirit behind the game must be that of gentlemen.

"Reservoirs of power, available only under great excitement, exist in all of us."

"The response to stimulation after a period of inaction is less vigorous than the response to precisely the same amount of stimulation after the muscle has been exercised for awhile. This fact explains the necessity under which baseball pitchers and other athletes labor of warming-up before they can use their muscles effectively."

Why not warm up swimmers?

Genuine muscular fatigue is rare—most fatigue is more neural than physical. Similarly the loss of weight during practice or a contest is chiefly due to the loss of water through the pores of the skin; but little of the solid tissue is affected.

Muscular exertion means a great use of bodily energy. The body derives energy from the oxidation of carbohydrate foods. It follows that during the playing season an athlete should be served a liberal quantity of carbohydrate foods daily.

"The spirit of emulation and contest is a natural one and a noble one, and the spectacle of skilled athletes matching their powers in a fair, generous, courageous struggle for mastery, is inspiring, calculated to sustain interest in gymnastics and to supply that incentive which stimulates endeavor and counteracts the monotony of bearing, in decision of character, in quickness of judgment and in practice."

"Athletics are a splendid training in self-restraint, in chivalric resource in emergency."

If you come across something of value in connection with training, conditioning, or the treatment of athletic injuries, I'll be thankful if you'll drop me a card addressed 40 W. 29th St., New York City.

INDEX

Chapter I—Training	7
Chapter II—Applied Anatomy Physiology and Physical Examination	10
Head	10
Neck	11
Shoulder	12
Arms	13
Chest, Abdominal Region, Thigh.....	14
Knee	15
Leg	16
Back	17
SECOND WIND	18
Circulation in Exercises	19
Surplus Energy	19
Sleep	20
Warming Up	22
Mental Condition	25
PHYSICAL EXAMINATION	29
Chapter III—Conditioning	33
Football	35
Basketball, Baseball, Track.....	38
Swimming	39

Coach or Trainer	39
Chapter IV—Diet in Athletics	40
Dietetic Abominations	44
Sample Menu for Training Season.....	45
Sample Meals for Before Contest	45
Vital Factors Affecting Digestion	45
Chapter V—Bandaging and Taping.....	49
Taping	53
Protections	60
Chapter VI—Massage	62
Effleurage, Friction	63
Kneading, Percussion or Striking Movements.....	64
Procedure for Full Massage	65
Chapter VII—Hydrotherapy	70
Hydrotherapeutic Procedures	71
Chapter VIII—Football	76
Basketball	86
Baseball	88
Track	88
Chapter IX—Diagnosis and Treatment of Athletic Injuries....	93
Injuries and Treatment	94
Dislocation of Tendons	97

Recurrent Displacement of the Knee Joint.....	98 ✓
Dislocation of the Semilunar Cartilage	99 ✓
Fractures	99
Cracks of Ribs	100
Flattened or Broken Nose	100
Sprains	100 ✓
Pulled Tendons	104
Wounds	107
Contused Wounds	108
Bone Bruise	108
Black Eye	109
Cauliflower Ear	109
Ulcers	109
Hemorrhage	110
Internal Hemorrhages	110
Boils—Furnucles	111
Acute Abscess	112
Widespread Infection	113
Shock	114
Fainting, Nausea, Headache	115
Athletic Heart	116
Stone Bruise	117
Nose Bleed or Epistaxis	118
Varicose Veins	118

Subcutaneous Hemorrhages	118
"Charley Horse"	119
Cramp of Muscles	120
Hernia of Muscles	120
"Shin Splints"	120
"Wry Neck"	120
Metatarsal Pain	121
Wind Knocked Out	121
Contusion of Scrotum	121
"Gym Itch"	122
Vertebral Subluxations	122
Blisters	123
Inflammation of Periosteum of Bone	123
Stitch in Side	123
Teeth	124
"Water on the Knee"	124 ✓
Ingrown Nail	125
Flat Foot	126
Weak or Wobbly Joints	126
Weak Wrist	127
Staleness	127
Under and Over-Weight	128
Stiffness of Muscles	129
Chills	129

Vomiting	130
Hardening the Skin	130
Heat Exhaustion	130
Soft Corn	131
Corns (hard)	131
Burns	131
Sweaty Feet	131
Ringworms	132
Chapped Lips	132
Bunions	132
Finger Cracks	132
Callouses	132
Frost Bite	132
Chapter X—Common Ailments	134
Appendicitis	134
Biliousness	134
Cold	134
Constipation	135
Cough	136
Diarrhoea	136
Diphtheria	137
Acute Indigestion	137
Liberty or Ex-German Measles	137
Haemorrhoids	138

Brights Disease	138
Measles	138
Mumps	138
Nasal Catarrh	138
Pleurisy	139
Pneumonia	139
Acute Articular Rheumatism	139
Rupture (hernia)	139
Scarlet Fever	140
Sciatica	140
Smallpox	140
Syphilis	140
Gonorrhea	140
Tonsilitis	140
Influenza	141
Chapter XI—Supplies	142
Chapter XII—Hints and Glints	149