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Athletic Training

BY

S. E. BILIK, D. P.

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Athletic Training



BY

S. E. BILIK, D. P.

SERGEANT MEDICAL CORPS U. S. A.

FORMERLY TRAINER OF ATHLETIC TEAMS

UNIVERSITY OF ILLINOIS

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TO
NOVEMBER 4, 1916

(ILLINOIS 14—MINNESOTA 9)

And the men who made the day memorable.

Coach—Robert Carl Zupke

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.

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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 Clarke 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 adopted 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 acknowledge 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.

Jan. 15th, 1917.

S. E. BILIK.

CHAPTER I

TRAINING

What is training?

"It is," says Wood, "to put the body with extreme and exceptional care under the influence of all the agents which promote its health and strength, in order to enable it to meet extreme and exceptional demands upon it."

The crude veterinary-like methods of the old time trainer have become a thing of the past. Training has evolved into a science which requires a thorough understanding of the human body, its structure, its functions, and its methods of adaptation to newly created conditions; diligent and persistent observation of cause and effect; open minded derivative judgment; and common sense conclusions. On analysis training is found to be divisible into the following branches:—

(a) *Conditioning*—preparation of the athlete for the intense muscular and neural exertions which are incidental to competitive athletics.

(b) *Treatment of Injuries*—practical and efficient application of first aid and the elements of minor surgery. The trainer's methods in the treatment of injuries are more drastic than a physician's because the former deals with vigorous youth possessing great power of recuperation, while the latter has real invalids to treat.

(c) *Specialized Training*—development, to the highest possible degree, of skill in the application of the individual's efforts in his chosen field of athletic endeavor.

Of these the last one, naturally enough, falls under the scope of the coach's work. The trainer's responsibility is thus limited to getting the candidates for the various teams "*into condition*" and keeping them, at least throughout the playing season "*in condition*." Thus the trainer's work may be likened to that of the man who provides the very best grade of raw clay, and the coach to the sculptor who moulds his masterpiece out of this clay. Less figuratively we may define a trainer as a cross between a specialized physician and a health director.

Some of the essential qualities of a trainer are—

Thoroughness—Half-hearted efforts net half-hearted results. The man who does not have his heart and soul in the work should not be a trainer—too much depends on him. “Whatever is worth doing, is worth doing well.”

Patience—“To get out of sorts is to paralyze one’s working power.” The trainer will encounter all manner of temperamental athletes and be annoyed with impositions of unreasonable “stars.” For various reasons there is often no choice but to bear it and grin. The measure of one’s power of leadership is frequently the ability to get along with all manner of men. Amiability, self-control, and a dignified attitude will ultimately gain the trainer peace and respect.

Cleanliness of Mind and Body—At all times the trainer must adhere to a high standard of thought and conduct. Youth is susceptible to influences, good or evil. The trainer who is morally lax or physically unclean is an abomination and a peril. The trainer must take sides definitely for good and against all evil. *Shoddy stories should be tabooed around the training quarters*—nip them in the bud at the start of the season, for moral degradation is usually the forerunner of physical degeneration.

Optimism—Confidence and cheerfulness are always contagious. During the long training season, and even more so just before or during a contest, the trainer’s psychological aid is often of more value to the team than his physical efforts.

Ingenuity-Resourcefulness—A trainer can obtain much valuable information from books, but unless he possesses the ability of applying this information, of drawing analogies and skillfully fitting the conclusions to the case in hand, he is sure to fail, or at most to remain a trainer of mediocrity. In his studies he must endeavor to grasp the reasons for a certain procedure of treatment, rather than to attempt merely to memorize the treatment.

Calmness—Time and again the trainer faces a serious situation. He must act coolly, confidently, and promptly. Nervousness implies uncertainty and instills doubt as to his ability to handle the case properly. Knowledge alone brings surety in action.

Foresight—The trainer must be alert, ever watching his charges as a mother watches her brood. Athletes are rather lax in reporting

injuries or incipient symptoms of ailments. It is up to the alert trainer to detect "somethin' wrong." He must learn to be a student of human nature and to be able to diagnose the condition of the men under his care, by their faces, eyes, muscles, and general appearance. He must "beat trouble to it." A suspicious looking pimple ignored develops into a troublesome boil; a complaint of indigestion disregarded may mean mal-nutrition and consequent "out of condition."

Finally I want to emphasize the fact that a trainer or the coach who does his own training must recognize that the scope of his work in the treatment of injuries is narrowed by the degree of his preparation and experience. *Practicability*, which is the essence of the trainer's methods, is a quality gained only through experience and is consequently limited by the extent of the latter. A trainer should never overstep these limitations. At all times he must bear in mind the fact that he is not a physician and that he has no moral right to take risks with the welfare of those entrusted to him. When in the least doubt of his ability to handle a case, being unable to make a diagnosis, or suspecting a serious condition, it is his duty to call a physician immediately. At all times proper co-operation between the trainer and the medical adviser will mean increased efficiency in the conditioning of the athletes.

CHAPTER II

APPLIED ANATOMY AND PHYSIOLOGY

I do not intend to waste much space by giving a summarized outline of Anatomy and Physiology. Admittedly a thorough understanding of the human body, its structure, its needs, and its functions, is essential to trainers as well as to coaches who do their own training. For, lacking that knowledge, we would have no moral right to treat injuries or ailments. It is safe to assume that the great majority of trainers and coaches possess that knowledge. To these my brief summary would be entirely superfluous. To those who lack the knowledge, the outline would do no good, since anatomy and physiology are subjects too broad to be justly treated in a few pages. To them I would suggest the perusal of some good text book on the above subjects. I am sure they will find the reading not only instructive but very interesting as well. My intention in this chapter is merely to call attention to the particular parts of the body with which we are frequently concerned in training.

HEAD.

Skull—involved in contusion and concussion of the brain as well as in minor injuries.

Auricle—(external part of the ear)—is subject to “cauliflower” and may be partially or completely torn off.

Nose—the cartilage of the nose and the nasal bones may be fractured or dislocated. Nose bleed is frequently very troublesome. In practically all cases the bleeding comes from a small 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.

Lips—occasionally swollen or split due to violence.

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

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

Lower Jaw Bone—is subject to fractures and dislocations.

NECK

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.

Medulla Oblongata—is located at the nape of the neck. It is a part of the brain and controls the respiratory organs. It lies in a rather exposed position and as a result is subject to injury. Since injuries of the medulla are likely to prove serious this part (in football) should always be well protected.

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 stretching of the surrounding muscles 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 dilatation 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. Bending exercises are best for the development of these muscles. These muscles 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.

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. These glands are sieves for the waste matter of the body and their swelling is an indication of a morbid congestion.

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."

Semitendinous 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.

KNEE

Patella—a sesamoid bone subject to fracture and dislocation.

Semilunar Cartilages—line the articular surfaces of the knee joint. A fragment of these cartilages chipped off by violence is the cause of the "floating cartilage of the knee," a very troublesome injury. The semilunar cartilages are also subject to dislocations.

Bursae—are little sacks containing lubricating fluid and are located near the joints beneath the neighboring muscles and tendons. An inflammation of these bursae, due to a wrench or a blow on the joint, results in a condition known as "bursitis."

Internal and External Lateral Ligaments of the Knee—in severe sprains of the knee joint these ligaments may become over-stretched or ruptured causing weak or "wobbly" knees. I have in mind a case of a youth who made a brilliant athletic record while in high school and was much sought after by different colleges. He finally decided to enroll at Illinois, but he never played for us. The lateral ligaments of his knee were torn, and nothing could be done for him—nothing barring an operation, and that was out of the question.

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.

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 and strength 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 criticise 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 my 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.

And it is in this phase of athletic training—conditioning, that the trainer's resourcefulness and a knowledge of 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 treat-

ment. 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.

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 leftover 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 reporting in good condition. 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 your 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 mollicoddles, 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.

Next make appointments with each one of the probable 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. 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. 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 but with a cur.

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.

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 stops 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.

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.

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.

SWIMMING

The best conditioning exercise for swimmers is swimming. This sport is an all-around developer.

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 store-house 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 in 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 quarter-back 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 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 num-

berless 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, grapes, 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 and while on trips we have always ordered toast for the athletes.

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.

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

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.

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.

DIETETIC ABOMINATIONS

Spices and Condiments—Catchup, 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, ice water, all needlessly irritate the stomach causing gastric distress.

Lunch Counter Sandwiches—"Hamburgers", "dogs", hot ham, etc., have a negligible nutritive value but 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 to-day 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, dessert, 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. *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 practicality 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 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 commend-

able 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 was 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 "Dietetics 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—

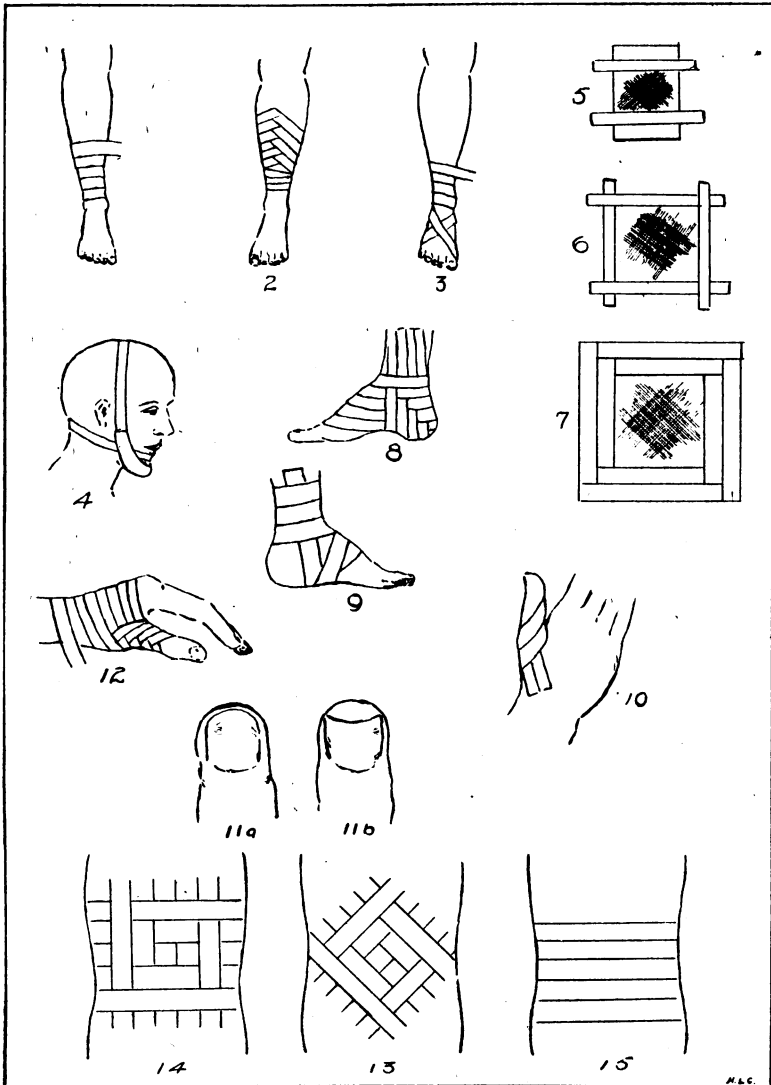
1. *The Spiral or Circular*—(Ill.1)—A series of ascending spirals or turns, each succeeding one partially overlapping the preceding one.

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 "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



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

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).

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.

Antiphlogestine Bandages—Occasions for the application of antiphlogestine 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 antiphlogestine goes to waste.

Method 2. Place the hot antiphlogestine 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 antiphlogestine 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 incident-

ally in absorbing the liquid part of the antiphlogestine. 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 antiphlogestine 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.

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 antiphlogestine 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.

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 elastic bandages is of no practical value. Its aid is purely psychological and that is of no help to a man making a zigzag 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 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.

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 and 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. 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, 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. 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 perpendiculars 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 out side 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 Combination Bandage—Strapping with adhesive is indispensable yet much can be said against it. The tape left on for a week irritates and weakens the skin predisposing it to infections. The presence of an artificial support tends to weaken the ligaments of the foot. Thus while necessary taping is also harmful. The problem of how to get rid of the objectionable features of taping has probably been faced by most trainers.

Last fall I made up my mind that none of my men would be forced to keep tape on a week. In Chicago I obtained a rubberoid material, cut it in strips, ($2\frac{1}{2}$ inches in width) and at the start of the football season used these bandages, applying them in Figure of Eight form. The results were satisfactory. Later in the season when the rubberoid bandages became worn out I started to use muslin strips with equal success. Throughout the whole season I had but two sprained ankles. Every afternoon the men had the bandages put on and fastened in place with a short strip of adhesive. The day's work over, the bandages were removed and hung up to dry. For games I continued to use the Gibney tape. The athletes welcomed the change, and the scheme proved both efficient and economical—a very satisfactory combination.

Such bandages may be laundered weekly or a new supply may be used, since the bandaging can be obtained at a very slight cost. In my own experience three yards of muslin at eighteen cents the yard, yielded about fourteen strips, two and a half inches in width, at a cost of less than four cents each.

Procedure of Application—(Ill.3)—Evert the foot and keep it everted. 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.

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, 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 horizontal 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 determine 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.

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 as supports elastic bandages are worthless. They are most 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. To a small extent they are helpful in steadying weak or wobbly joints.

Whitelocke's Elastic Bandage—(Ill. 11) 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 protections 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. 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 joint 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.

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.

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 maché 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 of sponge rubber on the inside of the shoe, which fits just over the malleoli.

Pneumatic rubber doughnuts, rubber sponge, sponge rubber, paper maché, leather, aluminum and elastic bandages may be utilized in the preparation of protections.

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—

1. *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.

2. *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.

3. *Kneading*—Four varieties—

(a) *PETRISSAGE*—Superficial kneading with the tips of the fingers; a combination of a rolling, squeezing, and stretching manip-

ulation 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.

4. *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). Effleurage 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 palms 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 abdomen 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, adduction, 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 gymnastics 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 "anat-

omical 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 in 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 re-invigoration 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 abdominal 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 a season. 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 athletes 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 thru 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.

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.

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

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, for 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 fluctuations in the weight of the individual from day to day are the best indicators as to his condition. When a man loses weight continually, watch him closely—he may be going stale.

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 water, or in brine, thoroughly dried and then painted with tincture of benzoin. Powdering the feet with talcum powder for the first few days of the season is sure to prove helpful in preventing tenderness of the feet. This treatment should be repeated daily until the feet are thoroughly toughened.

Start bandaging the ankles as soon as the coach informs you that he is going to begin training in earnest. Make your choice of the bandage you will use during the season. If you decide to use the cloth Figure of Eight bandages, (see under Bandaging) these will have to be put on every afternoon as soon as the candidate reports for practice. After practice remove the bandages and hang them up to dry.

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 retaped. 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 retaped 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 these 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". Canvass 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. 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, when they have cooled off, they may drink all they crave but in moderate quantities at a time.

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 team-mates 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. 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 fact soon tires him out. The tables can be covered

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 canvass 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 that 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 antiphlogestine 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.

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 accommodation or space often makes this impossible.

As the season progresses the approximate line-ups of the first and second team 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 re-invigorate 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 witchhazel, and a few drops of iodine, mixed thoroughly. This makes an invigorating, antiseptic compound. Because of its high price, last fall I dispensed with the use of alcohol entirely, relying on witchhazel to help keep my boys in condition.

For reasons of economy the rubbing mixture should be kept in copper or aluminum oil cans, squirting just enough to lubricate the part of the body to be massaged. 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.

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.

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, and a

roll of adhesive. The trainer must remember not to talk shop to the men. It is against the rules and may bring a penalty against his team.

Between halves have the men lie down. 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. 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 waters 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.

Long trips should be broken. Railroad travel rarely agrees with anyone, and there are many people who cannot sleep soundly on Pullman cars. Arrange to leave a day earlier and stop over at some mid-point.

The freshmen varsity should be put in charge of a capable assistant who can take care of all the minor injuries and massage those who need it. Serious injuries should be reported to the trainer.

BASKETBALL

In general the suggestions I made for the football team may be readily applied to the basketball team as well. I favor bandaging the ankles, but Ralph Jones, the Illinois basketball coach, is opposed to it on the ground that the bandaging interferes with the free mobility of the joints. All weak parts should be protected. The showers and rubs should be short and snappy, and the use of cold sitz baths should be encouraged. The rubbing mixture is the same as for football men. As the season progresses be on guard for staleness. Basketball men are very apt to overwork, and this, if combined with weak digestive power, or a poor diet, is sure to throw a man out of condition. Another thing to be guarded against is colds.

Before a game, if you have a man who is pepleless and apparently not on edge, have him take a short cold shower and as he steps out rub him briskly with a coarse dry towel. I have tried this method of stimulating pepleless athletes, time and again and have always obtained good results. If a man feels chilly, rub a little "hot stuff" on his legs.

Between halves have the men strip off their jerseys and rub the whole upper part of the body with a towel wrung out of cold water and then dry thoroughly with a Turkish towel. Don't make the men wait for their turn. Get the subs to help you. Then the men should lie down and relax completely. Cover them with blankets if the room is chilly. Hot beef tea may be given to those who like it. Hot coffee is craved by some, but the use of it should be dis-

couraged, since its short stimulating effect is quickly followed by a depressing reaction.

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 practically 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. Gradual 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 muscles.

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 travelling 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.

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-robcs, 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 at 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."

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 bottlefull of which you should be sure to have with you on the day of a meet.)

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

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 of 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 tenseness 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.

Peroneous 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 maleoli, 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.

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 crackling 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.

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. Retape. Repeat this procedure daily until the joint is completely healed. Under no circumstances should the joint be rested. It should not even be favored. 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, extending 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 an 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 a 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. Elastic supports are sometimes helpful. Howard Drew, the negro sprinter, generally wears an elastic bandage. So does Andy Ward, the crack C. A. A. (National Champion) sprinter, both of whom have "pulled tendons."

Rupture of the Semitendinous—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 White-locks'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 Tendon 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 side 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 grain alcohol or gasoline. 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. 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 carefully wash all abrasions with this solution.

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

"Strawberries"—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 to 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 antiphlogestine bandage. Application of an AWG (see under Supplies) dressing is very effective, but hot applications are the royal remedy for bruises.

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 the effusion. After the latter has subsided, apply hot fomentations to remove the swelling.

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 are 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 Unguentine 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 following 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.

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 help-

ful in reducing the local congestion. As a general rule refer all acute cases to the medical adviser.

BOILS—FURUNCLES

Cause—Infection by streptococci which take root because the local resistance is lowered by 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, however, be differentiated from a carbuncle, which covers a larger surface, is flat, and may have a number of "heads." (The treatment of carbuncles should be referred to a physician.) Treatment—it is advisable to lance a boil as soon as it is detected. The only thing gained by waiting for it to come to a head is a further spread of the infection. If, however, you prefer to wait until it "ripens" then you can hasten the ripening process by applying hot antiphlogestine or cotton-wool soaked in hot glycerine or a dressing of Ichtyol ointment. Procedure of treatment—1. Wash the surrounding skin with grain alcohol and paint with tincture of iodine. This is to prevent infection from the escaping cocci when the boil is lanced. 2. 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 allow the removal of the core. To lessen pain the boil may be anesthetized with a drop or two of ether or by rubbing with a piece of ice. 3. Apply Bier's suction cup (which can be obtained from any drug supply house.) This should draw most of the contents out. If the core remains, extract it with a pair of aseptic tweezers. 4. Swab the cavity with a piece of cottonwool saturated with iodine. 5. Apply a dressing of cottonwool soaked in glycerine, which has antiphlogestic power, and will draw out what remains in the cavity. 6. When the boil is thoroughly cleaned out, keep it aseptic by painting daily with iodine and covering with a dry dressing. Change bandage daily until the wound is healed.

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 contraindicated, 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 red 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 antiphlogistine 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 the 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 inflame, 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 re-

frain 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 characteristics 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 the 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 development; 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 re-invigorate the man for the coming contest. I have used this method with unfailing success.

"STONE BRUISE"

Cause—Hitting some hard object. The injury is very irritating and painful. It generally occurs on the sole or the 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. *Treatment*—soak the affected part in hot water. Massage derivatively. Apply a dressing of cotton-wool saturated in glycerine or covered with a layer of Unguentine—either of these will help to soften the congested parts. Protect and rest the affected parts by means of a sponge rubber or felt pad so fitted as to remove all pressure from the sore spot. This injury should not be ignored, since it is likely to prove very bothersome, incapacitating the athlete for some time.

"CHARLEY HORSE" (*Muscle Bruise*)

Cause—Violence. *Symptoms*—a hard, painful congestion at some particular part of a muscle, radiating along its course. The Sartorius muscle of the front of the thigh is most frequently affected. *Treatment*—the main object is to increase the local circulation in order to carry off the extravasation and aid in the healing process. Apply hot fomentations for from one half to one hour. Massage derivatively (around, but not on the affected part, and toward the heart.) Paint with iodine and apply either an anti-phlogestine bandage, or hot fomentations, or a hot water bottle, over night. The next day use hot packs and massage hard with "hot stuff." Protect with paper maché and send the man out. No man should stay out of practice on account of a "Charley" unless it is a very severe one. But protection is important, since a second blow may do much harm.

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. Quiet and plenty of air is essential. Wash the face with cold water or a chunk of ice. If the seat of the injury is painful, apply hot fomentations.

CONTUSION OF SCROTUM

Cause—Violence. This injury generally occurs in scrimmage or during a contest. *Treatment*—rest on the back, knees flexed. If the pain is severe, support the genitals. Apply cold fomentations. Raising the lower limbs high lessens the congestion, relieving the patient.

GYM ITCH

Cause—Friction; failure to dry parts; excessive sweating. *Location*—crotch and axilla. *Treatment*—wash with alcohol. Paint once with iodine. Then dust daily with talcum powder. If persistent, rub in Unguentine. Wash out daily with alcohol and re-apply the Unguentine, since there is danger of the salve becoming rancid if left on too long. 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 (BURSITIS)

Cause—Inflammation of one or more of the bursal sacks which lubricate the knee joint. *Symptoms*—swelling, hollows of the joint fill out. Palpation proves presence of effusion. Pain or tenderness may be present. The patient is able to use the knee but feels insecure. *Treatment*—some cases respond immediately, others persist. Complete rest for a day or two is essential. The various treatments are given below in the order of their effectiveness.

(a). In mild cases apply hot or cold fomentations or dry heat; massage derivatively, mostly stroking movements upward. Apply Whitelock's bandage over night. Rest joint for a day or two.

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 affected 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 cotton wool 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 exercises); (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. Army physicians 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.

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; overwork; overeating; eating of wrong kind of food—constipation or indigestion; dissipation, etc. Symptoms—the first sign is loss of weight. The face becomes drawn and pinched; the athlete lacks driving power, becomes “temperamental,” peevish and irritable, loses appetite, and sleeps poorly. Treatment—the athlete should lie off for a few days, not stopping activity entirely but taking things easily. He should eat pure, easily digestible, wholesome food, and take long walks in the open air.

Plenty of sleep is essential. Give the man a full body massage daily followed by a percussion douche (see Hydrotherapy) and a cold sitz bath. Massage with warm olive oil, paying special attention to the abdomen and the spine. A vibratory treatment is sure to prove helpful.

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 lie 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. Rub the patient down with alcohol. When an athlete complains of a chill, attend to it at once, since it may turn into a cold, tonsillitis, 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.

Glycerite of tannin is said to be a good skin toughener. It should be rubbed in well. Alum is used by many trainers for the purpose.

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, uncleanliness, 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.

CORN (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 friction 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 cotton-wool 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 knife. Wash with alcohol. Paint with benzoin or collodion. Apply a pad for protection and to remove the pressure. Painting with acetic acid will help soften the callouse.

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.

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 the appendix, a small pouch-like organ the size of the little finger, located close to where the small intestine joins the ascending colon. The function of the appendix is unknown.

Cause—decomposition of undigested food by bacteria, the toxins produced irritating and inflaming the appendix. This inflammation may spread to the surrounding tissue.

Symptoms—a severe stabbing pain in the region where the appendix is located (right groin), coughing increasing the pain; local tenderness; more or less prostration; nausea, vomiting, and lack of appetite; fever and rapid pulse.

Means of prevention—proper diet.

First Aid—hot enema. Ice packs to pain area. Under no circumstances should a laxative be given. Send for a physician.

Biliousness (Torpidity of the Liver)—a congestion of the liver due to some disorder of the digestive process. The whole digestive apparatus is torpid, 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 clean out the bowels. 60 c. c. of Epsom salt solution, as a laxative. Instruct patient to drink all the hot water possible. Give a steam bath followed by a full body massage. Regulate diet. Increase quantity of fruit and green vegetables eaten.

Cold (Coryza)—an inflammation of the mucous membrane of the nasal passages characterized by a profuse discharge of thick mucus. A germ is blamed for this ailment, but the predisposing cause is a body congested with impurities. Those who keep their bodies clean and their vitality high are safe from colds.

Treatment—elimination by all possible means. Hot enema. Steam bath followed by a full body massage. Limited diet for a few days. The drinking of large quantities of lemonade is of benefit. To loosen the congestion in the nasal passages use an antiseptic spray, or boil some water and pour into it a teaspoonful of tincture of benzoin. Inhale the fumes.

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. Colds are infectious and epidemic.

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 the 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, 60 c.c. of Epsom salt solution, or with two C. C. pills (See supplies.)

Cough—A cough is not an ailment in itself, but a symptom of some other disorder, 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.

Diarrhea—Diarrhea 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 diarrhea, 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. If the diarrhea proves persistent give paregoric, teaspoonful every hour.

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 Dyspepsia—Wrong eating is at the root of all digestive ailments, and it follows that the remedy is dieting. If you have an athlete attacked with this complaint place him on a limited milk diet for a few days and aid the eliminative power of the body, by giving 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.

Hemorrhoids; 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 is 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. The numerous patent medicines, "sure cures," are worthless.

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 hot enema to cleanse the bowels, and a hot steam bath to increase perspiration. Inhaling steam or using a spray of some antiseptic will relieve the complaint.

Pleurisy—Pleurisy is an inflammation of the serous membrane which covers the lungs (the pleura). The usual cause is exposure

when the bodily vitality is at a low ebb. The most prominent symptom is a severe stabbing pain just under the shoulder blade.

Pneumonia—An acute inflammation of one or both lungs due to exposure combined with a low state of vitality. A specific germ is the cause. The initial symptoms are—violent chills, fever, pain over the affected region and over the heart, complete prostration and flushed face.

Acute Articular Rheumatism (Rheumatic Fever)—Streptococci breeding in diseased tonsils or in decayed teeth are blamed for this ailment. The symptoms are—severe, almost unbearable pain, high fever, increased pulse rate, prostration, inflammation and swelling of joints, and repeated acid sweats. The attack is generally self-limiting (two to three weeks) but there is grave danger of complications, the heart being especially liable to become involved.

Rupture (Hernia)—Rupture is the protrusion of a part of an organ through some part of the abdominal wall. Careful examination by a competent physician can determine whether the protrusion can be remedied with corrective exercise or whether an operation alone will bring relief. 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.

Tonsilitis—An inflammation of either one or both of the tonsils. Tonsilitis in itself is not very dangerous, but the germs which breed

in the diseased tonsils and the toxins produced by them, taken up by the blood circulation cause rheumatism, heart trouble, etc. Diseased tonsils should be removed. Temporary relief may be obtained by gargling Dobell's gargle, or warm Boric acid solution.

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.

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. On account of the war, alcohol has become so expensive a drug that one is justified in looking around for a substitute. Gasoline can take the place of alcohol in washing out wounds, and for rub-downs we may rely on witch-hazel.

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 boric 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.

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.

The European war with its wide field for experimentation will no doubt result in the discovery of antiseptics and germicides far superior to any used now.

The above sentence was written in 1916. It is 1918 now and the market is flooded with all sorts of "wonderfully effective" antiseptics. In most of these chlorine is the active element. These antiseptics have been tested on war wounds and have proved their effectiveness. At this point, however, I cannot recommend any one particular mixture as suitable for the needs of a trainer unless it be dichloramentine.

Collodion—Antiseptic and protective. Good for small wounds.

Compound Tincture of Benzoin—a resinous balsam, antiseptic, and protective, since drying, it forms a water-proof covering over the wound. Used chiefly for toughening the skin, especially of the feet.

Unguentine—is a patented preparation, and as a rule it is not considered good policy to recommend patent medicines; but here is an ointment that has done some very effective service, and it is no more than fair to say that it has proved efficient. It is an antiseptic soothing ointment. Any bland ointment may be used as a substitute

for it. Zinc oxide ointment is very effective, but one should be careful not to use it in conjunction with iodine. Balsam of Peru is popular with physicians.

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.

Aspirin—is an acetyl of salicylic acid—a popular remedy for headaches. A quick but hardly a good one.

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.

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

Salicylic Acid—useful for removing hard corns.

Ethyl Chloride—a local anesthetic 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, antiphlogestic, 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 cotton wool 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 antiphlogestic (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—may be used to wash off adhesive plaster.

Synthetic Oil of Wintergreen, Oil of Camphor, Grain Alcohol and Witch Hazel—are used for rubbing mixtures.

Olive Oil—is used as a lubricant in massage and as food-tonic for run-down athletes.

Adhesive tape—Two inch zinc oxide tape.

Cottonwool—Antiseptic sixteen inch in width.

Roller Gauze Bandages—Two and three inch.

Roller Cotton Bandages—Two inch.

Sterile Gauze—Five yard packages.

Elastic Bandages—Two inches wide, five yards long.

Felt, Paper Maché, Shoe Leather—Used for protections.

Pneumatic Rubber Doughnuts—Excellent for protection of projecting bones and tender, sore or weakened parts.

Rubber Sponge and Sponge Rubber—Also used for protections.

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.

Ice bag, enema bag, thermos bottles, small pair of scissors, bandage scissors, tweezers, cataract knife for opening infected cavities, Biers suction cup, to draw out the contents of an infected cavity, etc., etc.

Hot Air or Steam Cabinet—A portable outfit can be obtained from any drug supply house for about five dollars.

An electric vibrator, photophore or arc light.

An Electric-Therapeutic Outfit—galvanic, farradic and sinusoidal currents in combination.

Electric heating pads.

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" (proving 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."

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 exertions mean 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."

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