

The  
**TRAINERS  
BIBLE**

By

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To  
My "Hostages to fortune"  
Mother, Thelma and Eugene

## PREFACE

"Trainers Bible" is the thoroughly revised, enlarged, brought-up-to-date, fourth edition of my "Athletic Training." I feel the new name is more appropriate—more descriptive of the contents. Again I have added so much new material and have made so many changes in the old contents that I have come to look on this book as one newly created.

If you skim over the pages you may get a general impression that "Trainers Bible" is but little different from its predecessor "Athletic Training." I am, therefore, going to ask you to read the book from cover to cover and you will soon discover the new and useful information that I have incorporated into the skeleton of the old book. This is especially true of the chapter on the Diagnosis and Treatment of Athletic Injuries, which after all is the one of greatest importance to you.

Your criticisms are cordially invited.

S. E. BILIK, M.D.

September, 1927.

## PREFACE TO THIRD EDITION

Five years have rolled by. As we live we learn. My experience in the Medical Corps of the Army, and the two years of medical study at Bellevue which followed, have opened up new vistas. And as I buckled in to the task of revision, it was with the pleasure of knowing that the additional theory and

experience I gained would help me in improving the contents. When I first offered this little volume to the profession, I had no suspicion that it would meet with such spontaneous approval and praise. It was clear that the book was not to be just another "dead one" on the shelf, but an active servant to the needs of the profession. Later when colleges, normal schools, and schools of physical education began using it as a text, I felt it was up to me to make good by making this treatise the most thorough and complete on the subject.

With thankful appreciation of your approval.

S. E. BILIK.

July 15th, 1923.

## PREFACE TO SECOND EDITION

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

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

S. E. BILIK.

July 15th, 1918.

## PREFACE TO FIRST EDITION

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

S. E. BILIK.

January 15th, 1917.

## 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. Trainers are applying themselves as intensively to the study of their problems as the physician does to his. No doubt there are still a few "know-it-all-ain't nothin' to learn" trainers among us, but these are a negligible minority.

On analysis, training is found to be divisible into the following branches:—

(a) **Conditioning**—Preparation of the aspiring youth for the intense muscular and neural exertions which are incidental to competitive athletics; development to the highest possible degree of strength, endurance, vitality and resistance to injuries; and

finally the progressive building-up of the heart, lungs and the other vital organs to meet the strenuous demands upon them.

**(b) Diagnosis and Treatment of Athletic Injuries**

—Practical and efficient application of the principles of first aid and 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 powers of recuperation, while the latter has real invalids to treat.

**(d) Specialized Training**—Development of the

specific neuro-muscular co-ordinations essential to the attainment of proficiency in a chosen field of athletic endeavor. No man is born an athlete. Every man, however crude and clumsy in his physical behavior, has potential ability to succeed in some form of sport. Speed, skill, suppleness, agility and strength are more or less essential requirements in any athletic game, but each of the latter has some peculiar requirements of its own. The degree to which men possess these qualities varies greatly, and it is the problem of the coach to mould this variegated material into a winning combination by means of specialized training.

Thus the last problem belongs to the domain of the coach. The trainer's responsibility is limited to getting the candidates for the various teams "**into condition**" and keeping them—at least, throughout the playing season—"**in condition**". 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." Athletic directors appreciate how vital a reliable trainer is to the success of teams. However brilliant the coach, if his material is poorly conditioned or disabled by injuries, failure is in store for him. The trainer, too, can make or break a team.

**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. This is especially true as the season advances and the incidental nervous strain increases. 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. Carefully avoid injudicious remarks which may be misunderstood and cause friction.

**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 training season, since moral degradation is not conducive to good physical condition.

**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. He comes in closer contact with the boys than does the coach and can say things to them that the coach cannot afford to. It is advisable for every trainer to read the splendid books on athletic psychology written by Griffith, Berry and Hammett.

**Ingenuity, Resourcefulness**—A trainer can obtain a world of theoretical information from books, but unless he possesses the ability of applying this "book knowledge" of drawing analogies and skillfully fitting the conclusions to the case in hand, he is sure to fail or at most remain a trainer of mediocrity. He must never do a thing because someone else does it "just so," no matter who the "someone else" may be. If a suggestion is presented to him, he must carefully weigh its virtues and flaws before adopting or discarding it. In his studies the trainer must endeavor to grasp the reasons for a certain procedure of treatment rather than to attempt merely to memorize the instructions.

**Calmness**—Time and again the trainer faces an exacting situation. He must act coolly, confidently and promptly. Nervousness or excitement implies uncertainty and instills doubt as to his ability to handle the case properly. Knowledge and experience alone bring surety in action.

**Foresight**—The trainer must be alert, ever watching his charges as a mother watches her brood. Most athletes are 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 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." On the other hand, some few athletes find great pleasure in complaining of all sorts of ailments, frequently imaginary ones. The trainer will need to be a "wise old owl" to differentiate between the real thing and exaggerations.

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 PHYSIOLOGY AND  
PHYSICAL EXAMINATION

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 be of no value, 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, and consider a number of physiological conditions of interest to the trainer.

## HEAD

**Skull**—Fractures of the skull are infrequent but do occur in athletics. Concussion of the brain in varying degrees of severity is rather common.

**Hair**—Daily wetting of the hair is inadvisable, since it predisposes to baldness. Athletes who bathe daily should conserve their hair by wearing bathing caps.

**Auricle** (external part of ear)—Is subject to lacerations, bruises, "cauliflower," and may be partially or completely torn off.

**Middle ear**—Is quite susceptible to infections originating in the nose, pharynx or tonsils.

**Mastoid bone cells**—Located just back of the ear. When a middle ear infection extends to these cells surgical intervention becomes imperative.

**Nose**—The cartilage and the small flattened bones comprising the nasal bridge are subject to fracture and dislocation. To avoid permanent deformity prompt correction of these injuries is indicated. Nose bleed is frequently quite troublesome. In practically all cases the bleeding comes from a small area on the nasal septum, where the network of small arterioles and venules is rather superficial. Catarrhal inflammations of the nose must be tackled vigorously to prevent downward extension of the infection.

**Eyes**—Defective vision is more or less of a handicap in athletics though we can all recall many a bespectacled "star." Bruises and inflammation of the eyes are common. The appearance of the eyes is a valuable aid in detecting illness. Clear sparkling eyes spell robust health even to the layman. Muddy, lustre-less eyes suggest indigestion, constipation, lack of sleep, worry, fatigue, etc. Jaundiced eyes point to disorders of the liver or gall bladder.

**Lips**—Occasionally swollen or split due to violence.

**Tongue**—May be bitten. The coating of the tongue is another valuable aid in diagnosing the condition of the stomach and bowels.

**Throat**—The pharynx extends from the back of the nose to the level where the oesophagus and the larynx start. The mucous membrane lining the walls of the pharynx is subject to catarrhal inflammations, which usually spread downward from the nose. From the pharynx, if the lesion is left untreated, the infection extends downward to the larynx, giving **laryngitis**; thence to the trachea and down the bronchial tubes when we have **bronchitis**; if the germs manage to attack the fine bronchial tubes (bronchioles) the patient has **broncho-pneumonia**. **Lobar pneumonia** involves the lung tissue proper (alveoli). There is no question that pneumonia would be much less frequent if folks paid more attention to their colds and catarrhs. In athletics if a man complains of a cold or a chill go at it as if it were a matter of life or death.

**Pharyngeal Thirst**—The throat frequently becomes parched at the start of a contest. This is what is known as "pharyngeal thirst" as differentiated from true thirst, the craving of the body for fluid. "Pharyngeal thirst" is due to the inhalation of dust (especially on basketball floors) and to nervousness, which serves to inhibit the flow of saliva (you'll recall how dry your mouth felt just before you began that speech before the Board of Education and see that that little cough you gave had a physiological basis). Chewing gum until the athlete gets over the pre-contest nervousness and gets into the swing of the game will help avoid this uncomfortable dryness. The parching due to the inhalation of dust can be relieved by gargling oatmeal water at every "time-out."

**Tonsils**—Lymph gland-like organs flanking the back of the mouth. Size and shape varies greatly in individuals. The more crypts a tonsil has the more germs it is supposed to harbor, the germs making their home in these crypts and "raising Cain" at every opportunity. On the other hand the tonsils are supposed to throw off cells which have the function of destroying the germs. Thus there is a constant battle between the tonsils and the germs. If the latter win, you have tonsilitis (inflammation of the tonsils). Tonsils, even if very large, are not harmful unless diseased or infected. A pair of large, ruddy, healthy tonsils are two good protectors against the myriads of bacteria thriving in the mouth. Diseased tonsils subject to repeated infections should be removed. The operation is a comparatively simple one and disables for only a few days. There undoubtedly is a surgical risk the same as there is in any operation, but it is a very small one.

**Teeth**—May be loosened or knocked out. There is a clever "odontoguard" on the market which prevents both. We are living in an age where bad teeth are blamed for almost every ailment human flesh is heir to.

**Lower Jaw Bone**—Subject to fractures and rarely to dislocations.

## NECK

**Lymph Glands**—Are sieves for the waste matter of the body. Wherever you find them palpable (swollen, so you can feel them with your fingers) look out for an infection. Do not ignore swollen glands. Find the cause as promptly as possible and remove it. Consult a physician. Infected wounds, tonsilitis, venereal disease, tuberculosis, cancer, etc., will cause swol-

len glands, which at times suppurate, forming abscesses which have to be lanced.

**Medulla Oblongata**—(The stem of the brain) is located at the nape of the neck. It is the part of the brain which contains the nerve "centers" controlling the action of the heart, the blood vessels, the lungs, etc., the most vital functions of the body. The position of the medulla is rather superficial and it is therefore exposed to injury. In football, helmets usually have special attachments which serve to protect the nape of the neck. The rabbit-punch, formerly used by prize-fighters, gains its effect by paralyzing the vital centers mentioned. This punch is now justly barred in the United States.

**Trapezius Muscle**—Wings out from the back of the head down to the shoulder. This is the muscle which is chiefly involved in traumatic "wry neck". The sterno-cleido-mastoid muscles running from just back of the ears down to the sternum are also affected in this disability.

## SHOULDER

**Clavicle**—Is subject to fractures and dislocations.

**Shoulder Joint**—This joint and the knee joint are the most troublesome in athletics. Any joint is formed primarily by the articulating surfaces of the opposing bones. These surfaces are more or less covered with articulating cartilages. The joint cavity is enclosed by a capsule which is intimately interwoven with the surrounding ligaments whose function it is to retain the relative position of the bones comprising the joint. The joint cavity is lined with a synovial membrane, which exudes an oily (synovial) fluid which serves to keep the joint well lubricated. The tendons of the

surrounding muscles passing over the joint and anchoring near it further strengthen it.

Now, when things go wrong, the articulating cartilages may break or dislocate. The capsule may tear, permitting a dislocation of the heads of the bones. The ligaments may be strained, sprained, torn, or become so lax as to fail in their function of holding the joint together in normal position. The synovial lining of the joint may become inflamed and pour out synovial fluid in great excess, distending the joint, (i.e., "water on the knee") and finally any part of the joint or the whole of it may become infected with germs of varying virulence: tuberculosis, syphilis, rheumatism, septic.

Get an anatomy text and take a long, lingering look at the structure of the shoulder and knee joints—both will give you plenty to worry about.

**Tip of the Shoulder**—Is formed of the acromioclavicular joint which is infrequently sprained and occasionally broken off.

**Subacromial bursae**—Is a rather lengthy sac of synovial tissue lying between the uppermost muscles of the shoulder and the deltoid muscle. Unquestionably most "sore or painful" shoulders are inflammations of these bursae, or perhaps of the sub-coracoid.

**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.

**Brachial plexus**—Of nerves, is a network originating in the cervical region of the spine radiating down towards the axillae and thence the large nerves composing it spread down the arm. Injuries of the plexus in its exposed position in the axillae or of one of its

nerves are not uncommon and must be thought of whenever an athlete complains of a painful injury in the region of the shoulder.

**Suprascapular nerve**—Its approximate location is in the groove of the shoulder. This nerve is frequently bruised in football, the injury incapacitating the 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 proven 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. Short, bunched, massive muscles may be of use to gymnasts, weight lifters and professional "health builders" but they are a distinct handicap to an athlete.

**The Long Tendon of the Biceps**—Is of interest to the trainer in that it occasionally tears loose from its enveloping sheath of fascia and may be found "swimming around" over the tip of the shoulder. This occurs most commonly among baseball players and unless treated correctly means an end to further athletic activity. This tendon is also likely to tear loose from its attachment to the scapula.

**Head of the humerus**—Is involved in shoulder joint dislocations and in fractures.

**Elbow joint**—Is subject to strains, sprains, dislocations and swellings (bursitis, synovitis, etc.).

**Wrist**—The small bones comprising the wrist joint are occasionally dislocated or fractured. Such injuries frequently remain undiagnosed until an X-ray is taken. Sprains of the wrist are frequent.

**Annular ligament of the wrist**—Overstretching of this ligament following sprains may result in permanent weakness of the wrist.

**The Hand**—Is a source of great worry to boxers. Linemen in football find strong hands quite as indispensable. Special exercises to strengthen and toughen the hands are indicative.

**Thumb of Hand**—Is subject to troublesome chronic sprains and teno-synovitis (inflammation of the sheaths enclosing tendons).

**Fingers**—Are subject to sprains, fractures and dislocations.

## CHEST

**Ribs**—May be fractured or dislocated. Osteopaths assert that luxations (twists out of normal position) of a rib where the latter forms joints with the vertebrae or the sternum, cause bodily disorders in the same manner as do subluxations of vertebrae—by interfering with the nerve supply of the parts affected. "Painful abdomen" is one of the conditions attributed to such luxations of a rib or ribs.

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

**Thorax**—Exercise tends to increase the size and expansion of the bony barrel formed by the ribs and sternum anteriorly and the spinal column posteriorly.

A large chest capacity is essential for the proper functioning of the heart and the lungs in athletics. Few shallow-chested youths ever make much of a splash in the athletic game.

**Heart**—Not so many years ago competitive athletics was accepted as a frequent cause of heart disease. However, as research-bent physicians began intensive studies to prove this, they found that the above was a mis-conception. Today, none but the ignoramus, repeats this "bogey-man" story. Normal physiological hypertrophy (enlargement) of the heart muscle undoubtedly occurs in all athletes; the pulse slows because the heart contractions are prolonged and powerful; and the blood pressure is lowered. Acute dilatation of the heart bringing either more or less permanent impairment of heart function, or even sudden death, is a possibility but a very infrequent one. If a man unfit for strenuous competition or a poorly conditioned man ignores the normal warnings of the body and over-exerts himself, acute dilatation may follow. But how often does that happen? There should be no hesitation on our part in claiming that athletic competition, however strenuous, can do no harm to the youth who has passed a physical examination qualifying him as fit for athletics and who had undergone an intelligent conditioning regime.

It is well for the trainer to remember that the heart of the adolescent lacks the tenacity and power of the heart of a more or less matured athlete. High school boys should never be worked as intensively as college athletes. We all know that and yet every now and then we see some coach throw reason to the dogs and drain a star youngster to the limit. General and severe condemnation should follow every such act.

**Lungs**—Are subject to inflammations.

## ABDOMINAL REGION

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

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

**The Stomach, the Liver, the Intestines**—If the athlete is to be kept in best condition, it is essential that the digestive tract function properly. Indigestion, constipation or biliousness, will disable an athlete or rob him of his vitality. Putrefaction of food in the intestines lowers the resistance of the individual and predisposes him to the successful invasion of some germ. Digestive disorders are one of the chief causes of staleness and vice versa staleness may cause indigestion and constipation.

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

**Inguinal (lymphatic) glands** — Located at the junction of the thigh and the abdominal wall. These glands frequently become congested, inflamed, swollen, and more or less painful. In searching for the cause carefully examine the corresponding limb for infected wounds, however slight.

**Sartorius or "Tailor's" Muscle**—This, the longest muscle of the body, is attached above to the ilium,

runs across the front of the thigh to the inner side of the shin bone, attaching just below the knee joint. Its function is to flex the thigh on the trunk and to cross the legs. It is frequently bruised, such an injury being commonly known as a "charley horse."

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

**External Genitals**—Subject to contusion, venereal infections, hydrocele, etc.

## K N E E

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

**Knee Joint**—Make a careful study of this joint in any anatomy text.

**Semilunar Cartilages**—Two crescent-shaped cartilagenous pads resting on the condyles of the tibia. A fragment of these cartilages may be chipped-off in the course of a severe wrench of the joint and become a "mouse."

A similar injury may loosen one of these cartilages which then has a tendency to slip between the opposing bones causing a "locking" of the joint, which is quite painful and which is followed by "water-on-the-knee" (synovitis).

**"Mouse"**—As a result of trauma, a piece of cartilage or even bone may become chipped off, wandering about the joint, obtaining nourishment from the synovial fluid, growing, rounding out. Should it slip in between the articulating surfaces, the joint locks, the irritation producing pain, immobility and excessive effusion of synovial fluid ("water").

**Bursae**—Are membraneous sacs containing synovial fluid which lessens friction chiefly round about the joints. They nestle between neighboring muscles and tendons. An inflammation of a bursae, due to a wrench, blow or infection, is called "bursitis," and is characterized by a more or less localized swelling. In athletics bursitis occurs most commonly over the tip of the elbow joint (posteriorly) and in the pre-patellar region.

**Internal and External Lateral Ligaments of the Knee**—These ligaments are involved in any sprain of the joint. If the injury be poorly treated, more or less relaxation of the ligaments may follow with resultant weakness and "wobbliness" of the joint.

## L E G

**Varicose Veins of the Leg**—Occasionally disable an athlete. If the condition is a very troublesome one and fails to respond to supportive treatment, it is best to have the bulging veins dissected out. The operation is a simple one.

**Tibia (Shin-bone)**—Is quite superficial and consequently is frequently bruised. Since bone injuries are very painful and disabling it is advisable to protect the shin. 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

**The Spinal Column**—Contains the spinal cord, a vital part of the body's nervous system. At each vertebrae nerves leave the main cable and slipping through definite nooks and loops in the bony processes of the vertebrae, run on to their ultimate destination. The vertebrae are held together by a complicated

network of powerful ligaments. The muscle tendons which have their attachments along the spine further strengthen this column of ringed bones.

Osteopaths work on the theory that in spite of all these powerful and numerous ligaments and tendons it is possible for a vertebrae to become "subluxated" which may be defined as meaning a deviation from the normal alignment. As a result of this luxation the nerves leaving the vertebrae are pressed upon. Pressure on nerves means pain and poor functioning of the organ or muscle they supply. Consequently if you have a pain along the course of the say, 6th thoracic nerve, why, there probably is a subluxation of the neighboring vertebrae.

I agree with osteopaths to this extent: luxations of joints, irrespective of the strength of the surrounding ligaments, are possibilities; there undoubtedly are conditions which can be traced to pressure on nerves and such conditions are especially apt to occur in athletics; a trained osteopath can do a lot of good in such cases.

However, it is well to realize the limitations of osteopathy. It is an affront to plain horse sense to be told by an osteopath that a pulled tendon or "water-on-the-knee" or a sprained ankle are due to subluxations and pressure on nerves. As for myself, I use osteopathic movements when the condition is one calling for this type of treatment; I use various physiotherapeutic measures wherever indicated; and finally, my medicine chest is well stocked. If I am a physician I must use all available means to help restore my patient to good health. I do not believe in being a cult adherent, an "opathist," an intolerant, unreasoning healer whose eyes are blinded to everything but his own narrowed opinions.

## CHAPTER III

### SOME PHYSIOLOGICAL FACTS "SECOND WIND"

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

Our respiration is under the control of a nerve "center" located in the medulla. This center is activated by the amount of carbon dioxide in the blood. Thus an increase of carbon dioxide will stimulate the center and yield an increased respiration rate. When for any reason the concentration of the gas ( $\text{CO}_2$ ) in the blood falls below the threshold necessary to activate the center, respiration stops altogether.

Suppose you are driving along in the first part of a quarter-mile run. The activity is producing a great concentration of carbon dioxide in the blood. The respiratory center is stimulated and the respiration rate rises rapidly. The increased aeration washes out the  $\text{CO}_2$  so that a condition is suddenly created whereby there is less  $\text{CO}_2$  in the blood than it takes to activate the center and respiration stops. This is the moment of suffocation.

At the same time the blood circulation has not yet adjusted itself to the increased demands and as a result there is a concentration of waste products (lactic acid, etc.) in the muscles, the toxins causing a condition of rigor, the muscles being tense, hard, un-

workable, "tied-up." The muscles of the chest and arm bind like a tight armor, further preventing respiration. But the silver lining is just around the corner.

The momentary cessation of respiration means that no  $\text{CO}_2$  is being eliminated and the gas therefore quickly accumulates to a concentration sufficient to stimulate the "center" and—you've got your "second wind."

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

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

### THE CIRCULATION IN EXERCISE

The heart is the pump which drives the blood through the body, supplying nourishment, removing waste. Its rate of contraction is controlled by a nerve "center" located in the medulla (stem of the brain). This center is sensitized by the amount of  $\text{CO}_2$  in the blood.

Now suppose you have begun to exercise. Energy is needed. In the muscles is stored a certain amount of glycogen which, when oxidized, yields: some lactic acid,  $\text{CO}_2$ , water and energy. The greater the activity the more oxidation and the greater the concentration of  $\text{CO}_2$  which is taken up by the blood from the tissues. This  $\text{CO}_2$  laden blood, in its course

through the body, reaches the heart-controlling center. The inhibitory control is lowered and the heart rate is accelerated. This means that the same quantity of blood (since we only have a given quantity in our body) will be hustled through the lungs for aeration and then through the whole body at a gradually increasing rate, a rate commensurate with the immediate needs.

### SURPLUS ENERGY

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

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

day. An occasional holiday may do wonders in re-invigorating your team.

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

### SLEEP

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

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

adhesive over the lips. Mouth breathing causes snoring, nasty taste in the mouth on arising, etc.

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

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

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

**Relaxation**—Teach the boys how to relax completely. Stretch out on a comfortable surface, legs uncrossed, head comfortable, shut your eyes, relax

every muscle in your body, and try not to think of anything at all, or if you must think, think of the shape of leaves. Five to ten minutes of such absolute relaxation works wonders. Any physical director who handles numerous classes will find this relaxation stunt a life-saver.

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

### WARMING-UP

Back of "warming-up" lies sound physiology.

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

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

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

On the other hand the long distance runner who has hit his stride, can be thinking of last week's prom, yet hold his rhythmic stride. Here consciousness is not the activating agent. Such movements, not re-

quiring conscious control, are reflex in character. The impulse originates in a specialized "end organ" located somewhere near the surface of the body; it flashes to the corresponding segment of the spinal cord, then stimulates the motor nerve fibers controlling the muscles which must contract to net the essential movement.

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

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

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

of scenery. Accumulated effects of neural fatigue quickly lead to staleness.

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

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

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

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

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

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

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

If you have a good man guard against "pulled tendon" more than any other athletic injury. And the best guard is thorough "warming-up," loosening, shak-

ing, massage, and protection against chilliness with oily hot-stuff, goose-grease and flannels.

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

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

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

### MENTAL CONDITION

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

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

"Keying-up" is the placing of athletes under a given mental tension. Prolonged—it is debilitating. Avoid keeping a team on edge too long. Bob Zuppke while on a trip with his team will tell stories and listen to stories that have little to do with football but help to wile away the draggy hours and delay the onset of nervousness. At the dinner table he is a genial host, just one of the boys. But see him in

the training quarters just before the game. His whole demeanor is changed. The face is sombre, serious, the jaw is set, he paces the floor with restless energy—a bundle of springs. Zup is "keyed-up." And every one in the training quarters begins to feel "shivery." It is contagious. The players are grim. There is no laughter. They are getting ready. All the talk is of football. The edge is there. The boys run out on the field for a few minutes of "warming-up." They return. And then comes the last talk. I suppose a man must be a natural leader of men to be able to inspire them with the will to do or die. Certainly a vigorous personality, an easy flow of clean, vigorous words, and conviction which comes only with whole-hearted belief in the cause, are vital essentials. What to say, when to say, how much to say, and how to say it, is more a matter of intelligence.

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

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

teams are traditional rivals and it is far more vital to win this game than the preceding one.

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

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

**Riding a Player**—It is an error to assume that since football and basketball are driving games, a coach is justified in using the same method towards all men. It is interesting to note that where coaches of basketball or football have remained with schools for a more or less lengthy period it was because they intelligently interpreted this phase, namely: that to get the best out of men you cannot use the same method toward all. This past season a number of well-known successful coaches were let loose by schools with the one complaint—"injudicial driving." Some men can be driven pitilessly, some to a degree, and some not at all. A kick in the butt may go far with a rough lineman, but a string of rather forceful panning to a highly strung open field runner may send him home nervous, depressed, worrying, unable to sleep, and when he reaches the field the next day he is far less capable of doing his best. The coach hands out a more emphatic panning—and in a very short time the boy is either stale or on the scrubs, and there, wonder of wonders, he is the same good player again, and the coach wonders what it is all about.

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

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

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

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

(Since the above was written, Prof. Griffith of Illinois and Elmer Berry of Springfield, have published excellent books on athletic psychology).

## CHAPTER IV

### PHYSICAL EXAMINATION

Every athletic department has or should have an associated physician, whose duty it is to pass on the fitness of the aspiring youth to participate in competitive athletics, and to take care of the injuries and ailments which are clearly out of the domain of the trainer.

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

#### GENERAL APPEARANCE:

- A. Healthy? Vigorous?
- B. Type of Physique? Height? Weight? Muscular Development? Type of Musculature? (long slender, or short bulky). Posture? Carriage?

C. **Skin—Color?** Cyanotic (blue) indicates anemia, poor blood or not enough of it.

Yellowish tinge — suggests a torpid digestive apparatus.

Eruptions? Scars? Operation scars?  
Tumors?

#### HEAD:

A. **Eyes**—Acuteness of vision is easily tested with special eye charts. Poor eyesight may be the cause of the persistent fumbling or sudden failure of your best "shot" to hit the basket.

B. **Ears**—Conversing with a man gives you a line on his hearing acuity. Test for "hard of hearing": hold a watch close to patient's ear (closing the other), slowly move watch laterally in a horizontal line at level of ear. A point is reached where patient just fails to hear the "tick." Mark the distance from the ear. Repeat procedure with other ear. By having a clear idea of normal limit you can thus easily determine the acuity of hearing of any case.

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

D. **Teeth**—Condition? Pyorrhea?

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

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

#### CHEST:

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

**Expansion**—Measurement.

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

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

#### HEART:

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

#### Be able to

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

You may locate it by—

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

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

### III. Auscultation—Listening:

- A. **Immediate**—By placing your ear over the approximate location of the apex.
- B. **Mediate**—With stethoscope. (Get a bell stethoscope for about \$4.00. You'll get a lot of sport out of it, even if you haven't got the chance to make use of it professionally).

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

#### B. Determine the Heart Sounds.

- a) The heart contracts to expel its contents into the arteries—this gives us the first sound “**lub.**”
- b) There is a barely perceptible pause.
- c) The valves of the Aorta and Pulmonary artery snap closed—netting the second sound “**dub.**”
- d) A slightly longer pause while the heart rests and fills with blood.
- e) The cycle is repeated, rhythmically, at an average rate of 72 cycles per minute. (About 60 in athletes.)

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

If in doubt instruct patient to run in place for a few minutes. If there are abnormal sounds the increased heart beat will accentuate them. If the breathing sounds interfere, ask patient to hold his breath for a few moments.

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

#### C. Take the Pulse:

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

Also note—

1. **Rhythmicity**—Irregularity in rhythm indicates abnormality.
2. **Strength or “size”** of pulse—a weak pulse indicates abnormality.

#### D. Take the Temperature:

Place thermometer under tongue for two minutes or over. Be sure to shake thermometer down before using. Normal temperature 98.6°. The mouth temperature is not as reliable as that taken by rectum.

#### ABDOMEN:

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

Any abnormalities? Operation marks?

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

## BACK:

## Curvatures of Spine?

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

## Extremities:

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

## Genitals (external):

Ulcerations? Scars? Discharges? Varicocele? Hydrocele?

## Urine Test for Albumin:

Fill a test tube half-full of urine. Heat over a Bunsen burner flame. If a white precipitate forms add a few drops of dilute acetic acid. If precipitate persists or increases in quantity, there is albumin in the urine, which should be examined microscopically.

## CHAPTER V

## BANDAGING AND TAPING

Thoroughness is the prime essential in bandaging, in the application of dressings to wounds, and in strapping with adhesive. "Any old way" wouldn't do, since the application is made for a definite purpose and consequently must be done systematically. If you are a beginner, you may find some difficulty in getting the knack of proper bandaging but a little practice will bring dexterity.

Roller bandages, whether of gauze or heavier material, are used primarily to hold dressings in place and to provide support to weakened parts. In applying a roller bandage:—

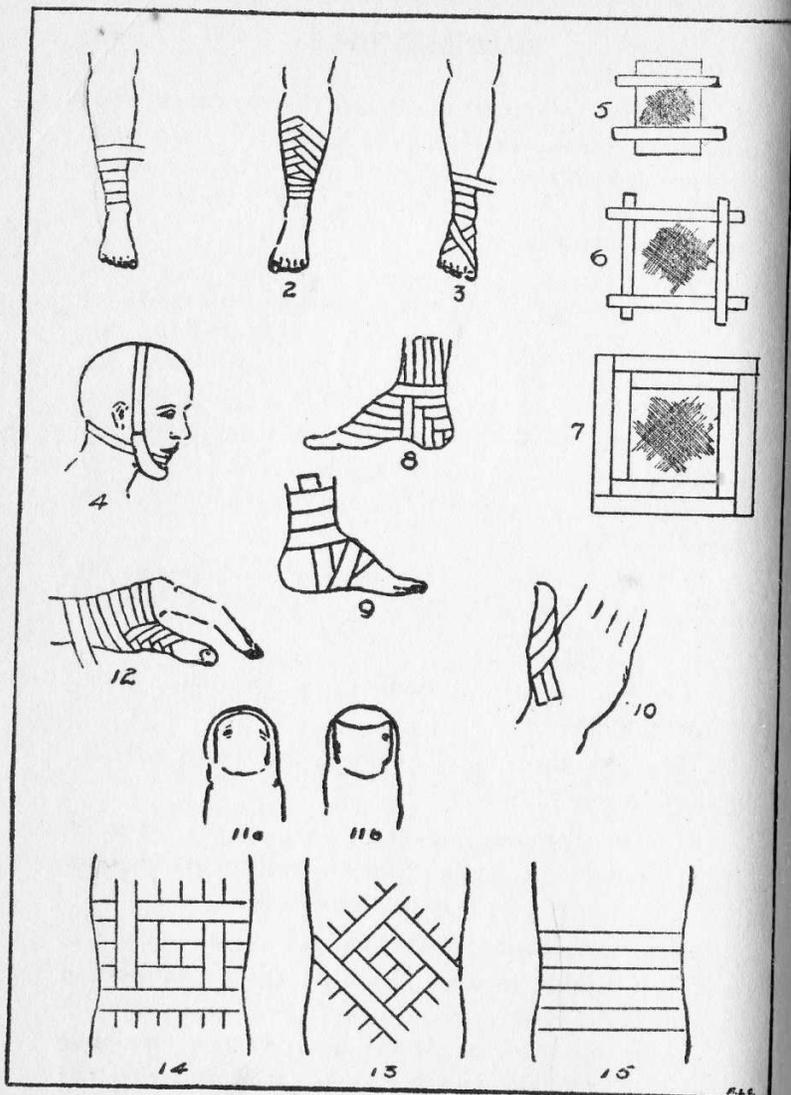
Hold the roll in the right hand, unwinding clockwise while carrying the bandage around the limb.

Have the limb in the position in which it is to remain when the bandage is on.

"Fix" the bandage at the start by making a number of turns around the narrowest part of the limb.

Always start at the narrowest part, carrying the bandage to the wider part. When the bandage begins to wrinkle invert it, so that the upper margin becomes the lower.

Apply snugly, but never so tight as to interfere with the circulation to the part. Bear this in mind especially when you are applying an elastic bandage the "give" of which will fool you. To play safe, al-



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. 11a. Wrong Way of Trimming Toe Nails (causes "ingrown nails"). 11b. Right Way. 12. Combination B. 13. Small of Back Diagonal B. 14. Small of Back Checker Work B. 15. Small of Back Overlapping B.

ways instruct your patient to nick the bandage with a scissors should he find that it is too tight and interfering with the circulation as shown by the pallor or "blueness" of the extremities, and at times even numbness and pain.

When bandaging the upper part of a limb for a swelling, it is best to start the bandage at the toes and carry it all the way up the limb. Failure to do this may force the contents of the swollen joint down the limb, which is not desirable. For example, if you apply a tight bandage to a swollen knee, the fluid from the joint will gravitate down the leg, whereas you can prevent this by applying a snug bandage from the toes to the knee.

Avoid creasing and wrinkling a bandage—as far as is possible. It spoils the appearance of the bandage and may cause irritation.

Fix the bandage securely so it will stay "put." Use adhesive.

There are three fundamental methods of bandaging a limb or any part of it:—

1. **The Spiral or Circular**—(Ill. 1)—A series of ascending spirals or loops, each succeeding one partially overlapping the preceding one.
2. **The Reverse Spiral**—(Ill. 2)—This method is a modification of the spiral. Each succeeding spiral is inverted at a definite point, generally at the mid-line of the limb, so that its upper margin becomes the lower margin. The advantage of this reverse is that the bandage can thus be made to fit the contour of the limb. The spiral and the reverse are generally used in combination.

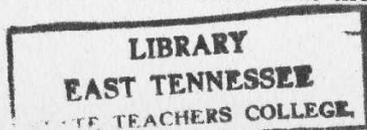
3. **The Figure of Eight**—(Ill. 3)—This bandage is exactly what the name implies—completed it has the form of the numeral 8. It is most useful in bandaging joints.

**Head Bandage**—Used for holding dressings applied to head wounds or bruises. Use 2 inch roller gauze bandages. "Fix" by making a number of turns around the head at the level of the forehead. Next start bridging the top of the head, carrying the gauze back and forth until the whole top of the head is covered by a snugly fitting cap. Now fix the loose ends of the bridging spans by catching them in a number of spirals around the head. A few strips of adhesive judiciously applied serve to further strengthen this bandage.

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

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

**Dressings for Wounds**—Only sterile gauze should be used in dressing wounds. Such gauze can be obtained in well sealed paper boxes, and the utmost care must be taken not to expose the gauze to any possible source of infection. Cut the gauze of a size



sufficient to overlap the wound approximately one inch on each side. The dressing may then be fastened in place with strips of adhesive laid crosswise (Ill. 5), or by taping down the margins (Ill. 6), or the latter may be further strengthened by applying a second layer of the adhesive partially overlapping the first (Ill. 7). Do not tape across the wound if exposing it to the air will aid the healing process. If necessary fasten the dressings in place with roller bandaging.

Where adhesive strips are contra-indicated or may cause irritation, the dressing should be made to adhere by painting the under surface with collodion, taking care to apply the dressing before the collodion dries.

### ANTIPHLOGISTINE DRESSINGS

Antiphlogistine is a patented preparation, the base of which is kaolin or clay, which is medicated chiefly with glycerine. The kaolin has the property of retaining heat for a more or less lengthy period of time and we consequently use Antiphlogistine when in need of an effective poultice. The glycerine is hygroscopic in character, that is, it tends to draw fluid to itself and therefore acts as a de-hydrating agent. This should make it a useful aid in the treatment of effusions such as "water on the knee," or in "drawing" boils.

Occasions for the use of Antiphlogistine in the treatment of athletic injuries are quite frequent, and consequently practical rather than elaborate methods of application are desirable. A very simple method used by many trainers is to place the clay in a gauze or muslin sack, which is then fixed to the part to be treated by means of roller bandages. The objection to this method is that much of the medicinal action of the antiphlogistine is lost.

Instructions as to the manner of heating the Antiphlogistine will be found on the cans. Always apply as hot as can be borne but be sure to test it on yourself first to avoid blistering the patient. The application should be three-quarters to one inch thick and be thickly covered with cotton in order to help in retaining the heat. A hot water bag or an electric pad tied on the outside of the dressing will further aid in the retention of the heat, which, after all, is the prime reason for the use of antiphlogistine. It is well to remember that any poultice stays warm for some time because it retains the heat given off by the part of the body it covers and also because of chemical reactions going on between the constituents of the poultice and the sweat.

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

Method 3. Have prepared cardboard frames, about six inches long, four inches wide, about an inch deep and tapering at the top. Cover the lower part

with gauze and tape the latter to the sides of the frame. Place this sieve-like arrangement over the area to be treated, fill with antiphlogistine about three-quarters of an inch high, cover with oil paper, and tape the margins Gibney fashion. Cover the whole with cotton-wool to retain the heat, fasten the dressing in place with gauze roller bandaging and adhesive. Use for "charleys."

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

Should you find difficulty in following these instructions, you can obtain a profusely illustrated pamphlet on methods of applying Antiphlogistine from the makers of this product.

## TAPING

Taping is the colloquial term for strapping with adhesive. It forms a very important part of the trainer's work. In general, adhesive is applied for protective, therapeutic or remedial purposes. Thus a part of the body may be naturally weak or may have been weakened by previous injuries, and is consequently in need of a protective support. Again we choose to prevent injuries by providing additional support to the parts most susceptible to trauma. Whatever the reason or object the fact remains that certain parts of the body, and especially the joints, must be protected by taping.

It is slightly more difficult to learn how to strap with adhesive than to apply a plain bandage. To begin with you will at first have a merry tussle with the adhesive:—it will glue on to your fingers, mess up, refuse to lay down smoothly, etc. But we have all gone through that.

Get the Gibney system of taping down pat. The essence of this all-important method of applying adhesive, centers in the fact that the successive layers partially overlap or form a network or a checker-work, this inter-weaving adding to the strength of the support. The uses of this method of applying adhesive are almost limit-less, in scope.

The question arises as to whether to shave hairy surfaces before applying adhesive. If the hairs are medium long, leave them alone. Shaving scrapes the toughened layers of the skin and exposes to infections. Again adhesive adheres better to hairy surfaces than to smooth ones, providing the hairs are not too long. If they are, it will be best to shave them off.

Adhesive may be removed by moistening it with benzine, ether, or a mixture of these two. I believe in ripping the adhesive off snappily to avoid prolonged agony. Get a solid grasp of one corner of the adhesive layers. With the other hand tighten the skin above. With one swoop pull off the adhesive parallel to the skin—not upward but parallel—if your pull is upward you'll carry along a hunk of skin. This appears to be a rather rough method but those who have experienced it will prefer it to the slow, bit by bit stripping.

**Ankle Taping**—In athletics the ankle joint is the one most liable to injuries—sprains, dislocations, fractures or a combination of any of these. Consequently it has been accepted by all trainers that an artificial support of some sort is an absolute indispensability. An overwhelming majority of schools use the muslin ankle roller bandages for the purpose. These will be discussed later. Strapping with adhesive is unquestionably the most reliable method of protecting a joint. The adhesive strips can be made to fit every nook, hollow and crevice of a joint, thus acting like a gloved corset. If a sufficient number of strips be used it is possible to attain any strength of support desired. The only reason adhesive supports have not been adopted universally is that it entails a considerable expense and most schools cannot afford the outlay.

I have no faith in fitted elastic or leather ankle supports. Their aid is purely psychological and that wouldn't do much good on a field full of treacherous little holes.

Every trainer has his favorite ankle "tape" and is willing to back it to the limit. Personally, I have tried out various tape arrangements, have always lis-

tened respectfully to suggestions, but after all these years I am still convinced that there is nothing superior to the Gibney ankle tape. It gives proper support to the joint; it does not impede the up and down movement of the foot; it is always comfortable and is well liked by all athletes; it does not compress the little bones along the outer margin of the foot; and if properly applied it holds its shape and effectiveness for the whole week. These are about all the virtues any supporting bandage can be expected to possess. Certainly none of the many others I have experimented with, compare with it. This "tape" can be used with equal advantage in football, basketball, baseball, soccer, hockey and for the treatment of injuries of the ankle joint.

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

Bend toes up, evert the foot, and hold it everted throughout the procedure. Start the first layer of the adhesive on the inside of the foot, two inches above the ankle joint—parallel and close to the Tendon of Achilles (the large tendon at the back of the leg). Carry the strip of the adhesive under the heel up on the outside of the foot, pull the tape snug—make sure the foot is everted—and fasten one inch higher than

the starting point. Press the tape down to make it adhere. Warming the gummy surface previously to applying will help in hastening it to adhere. (Place the rolls of adhesive on radiator.) This is the first perpendicular layer. Now the horizontal. Start at about the mid-point of the inside of the foot, follow the lower border of the foot around heel, pull snug, and fasten at the mid-point of the outside of the foot. Start the second perpendicular layer parallel to, and partially overlapping ( $\frac{1}{4}$  inch) the first layer. Follow with a second horizontal similarly overlapping the first layer. A third perpendicular followed by a third and a fourth horizontal complete the bandage. The horizontal layers should not meet in front, since, if they do, the up and down movement of the foot will be restricted, and this is undesirable. If the ankle joint is weak an extra perpendicular layer may be added.

Take due care that the adhesive is laid on smoothly and not full of wrinkles and creases, which may cause local pressure, interference with the circulation and irritation. To help this bandage to "get set," a combination Spiral Figure of Eight gauze roller bandage is applied tightly over the tape and the athlete is instructed to keep off his feet for about five minutes. If this is not done the tape will soon get loose and the bandage will become worthless. If  $1\frac{1}{2}$  inch strips of adhesive be used, three perpendicular and four horizontal layers will prove sufficient to form a strong supportive bandage. This bandage should last a week, but if it comes loose in the meantime it may be reinforced with a Figure of Eight.

A variation of the Gibney bandage, described above, is to carry the perpendicular layers instead of straight up on the outside of the foot, across the front of the leg just above the ankle joint. The horizontal

layers remain the same. This gives additional leverage. This method of strapping is used extensively for the support of weakened or flat arches.

**Figure of Eight Tape Support**—I am listing it because some trainers still use it, but I do not recommend it. It will give ample support to the joint if you use a sufficient number of layers of adhesive, but it lacks all of the virtues of the Gibney tape and uses up the same amount of adhesive. Under the circumstances, why bother with it?

**Figure of Eight Cloth Ankle Roller Bandage**—Strapping with adhesive is unquestionably effective but there is much to be said against it. The tape left on for a week has a tendency to irritate the skin and cause infections. Constant use of an artificial support tends to weaken the ligaments of the foot, predisposing to flat feet and injuries. And, finally, the incidental expense is an objectionable factor.

As far back as 1916 I began to seek a substitute for "taping." I tried elastic fitted supports, leather corsets, steel braces, in fact, most of the possibilities—but in common with most fellow trainers I found that they were all of little value. I then turned to muslin bandages and struck a "gusher." Today most of the schools in the United States use a specially woven cloth roller bandage, varying in length from 72 to 92 inches and in width from 2 to 2¼ inches. If the bandage is too long it becomes clumsy and ineffective. If too wide it cannot be made to fit the contour of the joint.

These bandages are staunch, dependable, comfortable, durable, washable and economical. An outstanding fact in their favor is that they can be put on just before practice and removed on coming off the

field, thus resting the feet and assuring sound sleep (did you ever try to sleep with a tight ankle bandage on?). The method of applying the bandage is easily taught and the boys soon learn how to put it on themselves. However, warn that carelessness in applying the bandage may make it valueless as a support. After putting on the bandage do not walk around until you have put on your sox and shoes, since the bandage is apt to loosen. Never apply the bandage over the sock.

The kind of cloth used is of little import except that it must be strong enough to act as an effective support, must not be of such thickness as to feel cumbersome, should be washable, so as to last a season, and soft enough to fit into the hollowed contour of the foot arch and joint. Unquestionably, the woven bandages with finished edges are the most durable. The bandage should be hung to dry after practice and sent to the laundry at least once a week.

**Technique of Application**—Flex the toes and keep them flexed. Evert the foot (bend it outward and upward) and keep it everted until the bandage is completed. Start on the ridge of the foot arch, carry the roller on the inside of the foot, under the arch, up over the arch on the outside, towards the leg, around the ankle (once or twice) placing the spirals above the joint. Carry the roller back to the starting point. Repeat the layers until the desired strength of support is obtained. The bandage may be fixed with a strip of adhesive, a few turns of black tape, or by having special binding strings sewn to the outer end.

There need be no doubt as to the dependability of this support if properly applied. Thousands of schools and colleges are using this method of avoiding injuries of the ankle joint.

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

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

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

**Shoulder Tape**—Where a sore spot is present, if the injury is extensive and painful, it should be protected with a layer of cotton-wool, a pneumatic rubber doughnut, a rubber sponge, or even an aluminum protector, but where limitation of motion is the only object, use the Gibney Shoulder Tape. The first strip of adhesive one inch in width (split two-inch tape in two), is started on the back, at the lower border of the scapula, close to the spine, carried upward across the shoulder, running down the chest, parallel to the sternum, fastening about six inches below the level of the shoulder. This is the vertical layer. Starting at the neck, the second strip is carried along the middle

line of the shoulder, over the tip of the shoulder to about six inches down the arm—perpendicular to the first layer. The third strip is started where the first ended, carried parallel to the shoulder, over the arm, back to where the first strip was started. Repeat these alternations with partial overlapping until a checker-work of the desired strength covers the shoulder. Note that the manner in which you apply the third strip will 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. A very useful bandage in injuries of fingers or the thumb.

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

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

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

daily taping of a large number of men is quite a waste of time and money.

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

**Spica Combination Bandage** (Ill. 12)—For the protection of the thumb, wrist and knuckles. The Spica differs from the Figure of Eight in that one of the loops is larger. Thus a Figure of Eight, which would include the thumb and the wrist would have the wrist loop far larger than otherwise. The successive layers partially overlap. Procedure: with one-inch tape start on the inside of the wrist, carry the strip of adhesive to the outside of the thumb, loop the thumb, taking due care to lay the tape on smoothly. Run the strip back to the wrist and once around it. The second layer is applied similarly, partially overlapping the first one. A third strip may be added if desirable. To include the knuckles simply carry one of these strips over the knuckles and around the hand instead of around the wrist. This bandage is widely used for linemen in football.

**Spica Cloth Combination Bandage**—Instead of adhesive many schools are using a woven cloth roller bandage  $1\frac{1}{4}$  inch wide to protect the thumb, wrist and knuckles. The procedure is the same as that described above. The bandage may be fixed firmly by

adding a few turns of black tape. I am quite enthusiastic about the possibilities of this bandage and believe it will become as popular with trainers as did the ankle roller bandage. Of course, boxers have used this bandage for years and it is hardly an innovation.

**Finger Bandage**—(Ill. 10)—Use Recurrent bandage (see preceding page) and if the finger be painful tape it to its neighbor, which by limiting its motion will relieve the symptoms.

**Elastic Bandages**—Many schools use woven elastic cloth bandages such as the ACE for the support of ankle joints. It appears to me that the use of these or any other type of elastic bandages should be limited to their application only in cases where elasticity is desirable, for example, in the treatment of "water on the knee".

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

## PADS AND PROTECTIONS

I believe a volume of three hundred pages could be written on the subject and still the coach or trainer would face situations where ingenuity alone could provide him the right sort of pad or protection. My only suggestion in the matter of protection is—use common sense. Study the case in hand, consider the materials you have and then figure out the best way of protecting the part with what you have.

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

## AVAILABLE MATERIALS

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

**Sea-Foam Rubber**—Similar in structure to sponge rubber but containing very little rubber and a lot of gas, it is lighter in weight than the proverbial feather. Sea-foam will replace the use of sponge rubber to a considerable extent but not entirely since it cannot be used where it will undergo constant pounding. For example, if used as a heel protector it is soon pounded down and becomes worthless.

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

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

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

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

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

**Leather**—Used as framework. Effective for protections.

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

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

**Corn Plasters**—Useful for small injuries.

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

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

**The Shoulders**—The linemen, especially, should have their shoulders well protected. Pneumatic rubber doughnuts and strapping with adhesive to limit the motion of the joint are two effective means of pre-

venting shoulder injuries. Sea-foam rubber comes in handy here.

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

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

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

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

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

## CHAPTER VI

### MASSAGE

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

The physiological effects of massage are:

1. Massage increases the blood circulation, locally or generally, depending upon the extent of the area treated.
2. Massage invigorates the various tissues of the body and the vital organs.
3. Massage acts as a sedative in cases of nervousness.
4. In cases of congestions of any sort, massage will break up the deposits of morbid 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 functions of the various vital organs—heart, lungs, stomach, liver, kidneys, nervous system, etc.

7. Massage may be considered as a sort of passive exercise system and by means of it, it is possible to prevent muscle waste which frequently follows an injury. Moreover, it is possible to keep the muscles of the athletes, who are for some reason unable to take active exercise, in the best of condition.

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

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

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

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

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

### EFFLEURAGE

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

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

### FRICTION

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

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

### KNEADING

Four varieties:

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

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

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

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

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

### PERCUSSION OR STRIKING MOVEMENTS

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

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

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

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

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

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

### THE PROCEDURE FOR A FULL MASSAGE

Have the patient reclining on his back, covered with a woolen blanket. Place a hot fomentation on the abdomen to draw a large supply of blood to the organs contained in the abdominal cavity, thereby stimulating them to increased functioning. Uncover only the part to be massaged and cover again as soon as you are through with the part, since there is always danger of chilling the patient. The muscle should be thoroughly relaxed, since but little benefit can be derived from the massage of tense muscles and it soon tires the masseur. Use some lubricant—my favorite is warm olive oil, but cocoa butter, talcum powder or cotton-seed oil will answer the purpose. Following the massage the oil lubricant should be washed off, since if left on it will result in the clogging of the pores. It must be understood that the lubricant has no special medicinal value. Warm olive oil acts as a sort of sedative of the superficial nerves, but outside of

that its value lies chiefly in the fact that by the 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 towards the heart.

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

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

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

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

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

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

#### Bend leg to a right angle.

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

#### Extend Leg—

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

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

(c). Effleurage whole length of the limb five times.

Same procedure to other leg.

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

3. Chest—Stand at head of the patient.

(a). Effleurage down sternum and up sides of the 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 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.

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

## CHAPTER VII

### HYDROTHERAPY

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

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

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

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

(c). Short applications of heat stimulate; prolonged, weaken; short, cold applications invigorate;

**prolonged cold lower the resistance of the body.** Cold applications are beneficial only if they are followed by a reaction—a pleasant sensation of warmth and added vigor. The alternation of hot and cold applications accentuates the effects.

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

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

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

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

### HYDROTHERAPEUTIC PROCEDURES

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

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

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

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

**Sitz Bath**—Galvanized iron sitz bath tubs may be obtained from any plumbing supply house. Common galvanized iron wash tubs will answer the purpose. These may be filled with hot or cold water, according to the effect desired. The two are frequently used in alternation, accentuating the effects. Only the pelvic and the abdominal regions should be immersed. The patient is instructed to sit down in the tub, keeping the feet and the upper body out. The effect sought is to stimulate the vital organs located in the abdominal and 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 unnecessary. 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. Furthermore 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 athletes' feet are subject to. We have always used the salt sponge bath during the football season and there is no reason why it should not prove as beneficial to trackmen, baseball men and others.

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

**Fomentations or Packs**—Are cloths wrung out in hot or cold water. Woolen or flannel cloth serves the purpose best by retaining the heat longest. Linen is

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

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

**Hot Air, Steam or Electric Light Cabinets**—All of these have the property of relieving congestions of

waste matter in the blood by inducing sweating. A natural sweat (through exercise) is always to be preferred but the trouble is that a man who needs a steam bath rarely has vigor enough to get up a sweat through exercise. A portable hot air or steam cabinet can be obtained from any drug supply house for about five dollars. There is a graduation 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.

**Therapeutic Heat Lamps** — There are numerous makes of portable therapeutic lamps on the market, all built on the same principle, namely, a heat producing carbon filament bulb within a glazed or mirrored reflector, which directs the heat rays directly down on the surface treated. The cost is nominal varying from four to nine dollars. These lamps are practically indispensable to the trainer since they are very handy, produce a high degree of heat and can be given out for home treatment. It is advantageous to have a number of them on hand in the training room.

**Infra-Red Therapeutic Lamps**—These are made on the same principle as those above, except that instead of a bulb the heat is produced by an "element" of special composition. This lamp supplies a greater degree of heat and should supplant the carbon filament bulbs. What we are after in training is a source of intense heat and in this respect the Infra-Reds are far superior to the carbon filaments. The medical profession and especially the physiotherapists, are discarding all "bulb" lamps and are taking on the Infra-Red outfits.

**Arc Lamps**—These large lamps may be of use to physicians but cannot be recommended to trainers. In athletics we usually have to treat a more or less localised area. If an arc lamp be used the effect is widespread and consequently diffused and ineffective. The smaller lamps supply just as high a degree of heat (at least as high as can be borne) and the application is well limited to the area we aim to treat. The large arc lamps are used for general application of light to large surfaces of the body, chiefly for its invigorating effect.

**Bakers**—There are any number of excellent bakers on the market. Some are equipped with bulbs and others with electric resistance coils. The latter are undoubtedly preferable but are quite expensive, the cheapest selling for about sixty dollars. Both types are very effective in the treatment of athletic injuries. These bakers supply a high degree of dry heat, insuring a vigorous local hyperemia.

**Diathermy**—This form of heat treatment has lately come into great favor. Diathermy machines deliver electrical currents of very high voltage (20,000-50,000 volts) and very low milliamperage. The

currents are driven through the bodily tissues at such a high frequency that the only effect produced is that of heat. The theory is that diathermy generates within the tissues the most penetrating form of heat and consequently when you have to treat a deep seated injury, diathermy is your best friend. Physicians, specializing in physiotherapy, as well as the few fortunate trainers, who happen to have diathermy machines, are very enthusiastic about the possibilities of diathermy. The latter, however, will not come into general use until the prices asked for the good machines are pruned down considerably. In the meantime, a good baker will do.

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

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

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

**Ultra-Violet Lamps** — Generating "canned sunshine" are of great therapeutic value in the treatment of various diseases but a trainer would have little use for them. Do not buy any of the popular priced carbon arc lamps, since they yield more dirt than effective therapy. The old high frequency outfits spitting showers of electric sparks through beautifully moulded glass applicators are of negligible value to either trainers or physicians.

## CHAPTER VIII

## DIET IN ATHLETICS

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

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

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

Briefly, the physiology of nutrition may be summarized thus: We partake of food in order to provide energy for the carrying on of the various bodily functions; in order to generate heat to keep the body temperature up to normal; and in order to provide the

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

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

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

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

4. **Degree of Activity**—Is, as a rule, severe during the 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 (sugar and starches) forming the greater part of the meal; an amount of fatty food proportionate to the time of the year; and green vegetables and fruit in abundance, to supply: (1) The essential mineral substances; (2) the vitamins; (3) the coarse, fibrous material which by adding bulk to the contents of the intestines aids the peristaltic movement, thereby preventing constipation.

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

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

of the numberless forms of disease. Especially is this true of the products of decomposition of proteins, nitrogenous compounds of an extremely poisonous character.

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

#### **An Athlete's Dietary Should Include:**

**Protein Foods**—Lean meat only; bar pork and like fatty meats. Fish, eggs. An occasional slice of bacon will do no harm.

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

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

**Legumes**—Beans, peas, lentils.

**Starch Vegetables**—Potatoes, turnips, beets, carrots, squash, etc.

**Green Vegetables**—Onions, radishes, lettuce, celery, etc.

**Sweet Dried Fruit**—Figs, dates, raisins, prunes, etc.

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

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

Orange juice, taken before breakfast, clears the stomach wall of the accumulated mucus and prepares it for the digestion of the food which follows.

Dr. Allen of Kansas, is quite enthusiastic in recommending that oranges be given athletes between halves or heats. Orange juice contains chiefly sugar and acid salts. The latter may serve to refresh the tired man but the invigorating effect of orange juice is undoubtedly due to the sugar content. In extensive experiments, Dr. Gordon of Boston has shown that feeding athletes glucose candy (an easily assimilable sugar) greatly delayed the onset of fatigue and appeared to increase the available energy of the athletes under observation. The findings are undoubtedly reliable and the question arises whether it would not be advantageous to increase the amount of sugars given the athlete during the training season and especially before a contest and between halves. I am not in position to experiment with this but am jotting it down in the hope that some trainers will test the effectiveness of increased sugar rations. Glucose candy is used because it is readily absorbed without having to undergo digestion, whereas our common sugar (sucrose) must first be broken up into glucose before it can be assimilated. Instead of giving your athletes whole oranges I would recommend orange juice in preference, since the pulp of the orange is just so much waste matter, which can serve only to clog the alimentary canal.

**Bread**—Whole wheat, whole rye, corn, bran or pumpernickel bread should be preferred to white bread. The latter thinly sliced and toasted is both appetizing and nourishing. While on trips we have always ordered toast for athletes. Ban hot bread.

**Beverages**—Weak tea, postum, cocoa, milk and butter-milk, are to be preferred to coffee. I favor forbidding coffee entirely since there is no question that it is harmful but it is often quite difficult to force a boy to dispense with an article of food he has had his whole life-time. The alternative is to cut coffee and tea to a minimum. It is said that cocoa is constipating but we needn't worry about that as long as the athlete is in active training—exercise and constipation are no mates. There should be no objection to a glass of near-beer taken with meals, it is neither beneficial nor harmful. A hot drink aids in the digestion of a rather heavy meal and weak tea or postum appear most satisfying for the purpose. Cool but not ice-cold lemonade or orangeade makes a welcome variation.

There is no rhyme or reason in the oft repeated assertion that milk "cuts the wind." Anything that clogs the stomach or intestines, fermenting and putrefying, will "cut the wind." One of the products of food decomposition is "gas" or more correctly a variety of gaseous substances. These serve to distend the stomach, the upper part of which presses up against the diaphragm limiting the downward excursion of the heart and the left lung. If under such conditions the athlete enters a contest he will find his "wind cut." Again, if the athlete is constipated and the whole body is sluggish, due to auto-intoxication (the absorption of the toxins of putrefaction in the bowels) the function of his heart and lungs will be depressed at the same

time and he will not be able to put forth his best efforts. The remedy is, of course, clear—an athlete must avoid indigestion and constipation. Milk is a nourishing and easily digestible beverage. It may safely be used as a part of the meal, being sipped slowly, whereas it usually is gulped to wash down the solid food which had preceded it. Milk, taken thus, forms a large clot, which is difficult to digest and delay in digestion always bring fermentation and "gas." Taken slowly it tends to form small, easily digestible clots.

**Pastry** — Fruit preparations; jello; rice or bread pudding; ice cream; cookies. Cake and pie should be barred during the training season—both are difficult to digest and may disturb the digestion. Candy in moderate quantity may be permitted after meals except to those who have a tendency to constipation.

**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 unchewed food.

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.

**Chewing Gum**—There may be objection to its use from the standpoint of good manners but it is to be recommended for the following reasons: taken after a meal it aids digestion by stimulating a continuous flow of gastric juice; it clears the mouth of food particles and exercises the teeth; it purifies the breath (no more halitosis); it allays nervousness and relieves throat dryness due to this nervousness.

### DIETETIC ABOMINATIONS

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

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

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

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

**Mush-like Foods** are indigestible and constipating.

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

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

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

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

### SAMPLE MENU FOR TRAINING SEASON

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

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

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

### SAMPLE MEALS FOR BEFORE A CONTEST

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

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

The more nervous the athlete the earlier should he eat the last meal before the contest. At times it may be best for him not to take any solid food, limiting himself to a glass-full of orange juice.

When on trips care must be taken that the men do not over-eat. 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 EFFECT 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. Drink a glass or two of milk if you are hungry at bedtime.

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

pit of the stomach, which so many people mistake for appetite.

#### 4. Eating Just Before or Right After Exercise—

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

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

6. **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 am not recommending 500 chews per bite but just enough to masticate the particles of food.

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, makes 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 digestible, appetizing, fresh food, properly combined and cooked—these things can be obtained only at a training table supervised by the trainer or the coach. Most colleges and schools cannot afford the expense incidental to running a training table. Instead, however, of having your men eat at innumerable different boarding houses, why not have them eat at one place where the proprietor is willing to follow the above suggestions?

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

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

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

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

4. Care was taken to supply some coarse food daily. We know that concentrated and refined food will cause the intestines to become sluggish. Coarse particles, such as the cellulose of fresh fruit and green

vegetables, give bulk to the contents of the intestines and serve to stimulate the peristaltic movement of the intestines, a daily movement of the bowels being thereby assured. Plain wheat bran was placed in bowls on the tables and the men were encouraged to use it in their soup and cereals.

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

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

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

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

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

## CHAPTER IX

## 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 the last three editions of this book I had the following to say:—

“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.”

Now, in the Fall of 1927, I can say that the above is not true—any more. In 1917, when I first wrote “Athletic Training,” there were few athletic books on the market. There were only two books on coaching football and both of them badly out of date. One or two pamphlets on basketball, Mike Murphy’s text on track, Berry’s and Clark & Dawson’s books on baseball, just about completed the coach’s library. Then came the welcome deluge of books from Zuppke, Ralph Jones, Gill, Meanwell, Bachman, Daly, Graves, Allen, Mather & Mitchell, Rockne, Heisman, Wardlaw, Ruby, Jones. At about the same time summer schools for athletic coaches sprouted all over the United States. Through these books and courses the gospel of “preparedness” or pre-seasonal conditioning was carried far and wide and today there are few schools that ignore this phase of training. Again, the post-war athletic “boom” brought larger squads, with resultant keener competition among the candidates for teams. Almost without instruction aspiring athletes began to report in excellent physical condition, no doubt actuated by the hope that it would help them make the squad or the team. In fact, today, we have to do quite a bit of warning not to overdo pre-seasonal conditioning to avoid having men report in too “fine” condition. We have much to be thankful for.

In order to properly 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 within a short space of time. Certain it is that enduring health, strength and stamina cannot be gained in a short strenuous training season. It takes time and pre-seasonal conditioning is consequently imperative.

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

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

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

ments common to the specific game in which the individual will try to gain fame.

### FOOTBALL

In 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.

Some schools try to get around this problem by having pre-seasonal camps but this should be condemned as making a business of athletics. The trainer who is able to offer the coach at the start of the season a squad of well-conditioned men, is indeed a man whose services are invaluable.

Shortly after the close of the season call a meeting of the left-over varsity men and the freshman squad. The meeting may be opened by the coach with a talk on the importance to the success of the team of reporting in good condition at the opening of the following season. He may emphasize the fact that the man who will not take time to stay 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. It is well to point out that the athletic life of a youth is rather a short one and one may as well make the most of this span. And, finally, he may appeal to their sense of loyalty to himself and their Alma Mater.

The basis of the trainer's talk will have to be:—"The intrinsic value of health." He must endeavor to prove that 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. Point out that a man's physical condition is never at a standstill. If a man is keeping himself in condition he is bound to be in good health and if he isn't taking care of himself he is bound to degenerate. Explain your theories of dietetics, taking care to prove statements which you have reason to feel may be doubted. Emphasize that dieting does not mean some form of partial starvation or the eating of peanuts and onions but merely the application of common sense in choosing the quantity and quality of one's food. Harp on simplicity and moderation in diet and the necessity of avoiding harmful foods. Proceed with your suggestions regarding exercise. Prove that it is the daily "work-out" rather than exercise in "spurts and spasms" that makes possible the attainment and preservation of the highest degree of physical welfare. Stimulate interest and advise participation in other sports, such as handball, baseball, basketball, track. Demonstrate four or five two-count exercises which call for vigorous body bending. Walter Camp had a world of faith in his "Daily Dozen." You can probably think of a favorite "dozen" of your own. Point out that ten minutes of calisthenics a day will keep fat and ill health away. But—warn against over-doing. Some boys over-anxious to please, may work too strenuously the year-round and this is not conducive to good conditioning.

Make appointments with each one of the prospective candidates for next fall's team. Thoroughly ex-

amine 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 and special setting-up exercises, are all efficient means for this purpose. Football candidates should be advised not to participate in swimming or tank games (water basketball, etc.). Swimming tends to soften the skin and muscles and deposit fat in thick layers; the lengthy soaking in sweet or salt water drains the vitality and strength and robs the youth of his natural speed. Football and swimming are no mates. Participation in other sports, especially basketball, should be encouraged, since the latter game teaches the men to be quick, agile and alert. All of these qualities are of vital importance in football, or for that matter in any team sport. Moreover, the competition in other sports helps the youth to gain that confidence and coolness under stress, which so greatly add to an athlete's value.

During the rest of the year manage to keep tab on the boys to make sure that your instructions are

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

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

When vacation time comes, the question of conditioning rests entirely upon the earnestness and conscientiousness of the athlete. If he is the right sort and is loyal to his coach and his Alma Mater, and if you have convinced him of the value of conditioning, then he will come back fit and trim.

Boys may ask you as to what type of summer work is best from the viewpoint of a trainer. Advise against hard physical labor, such as working with road gangs, building, delivering ice, etc. The job as counsellor at a camp is probably the most ideal form of occupation for a football candidate. I have stated the objections to swimming and these hold in advising against work as a life-guard. Clerical work plus participation in tennis or handball or a short daily calisthenic drill will bring the man back in fine condition.

Before the departure of the men obtain their addresses and as the summer progresses drop them occasional "reminders." Finally, about three weeks be-

fore the opening of the season, write them calling for increased activity—running, sprinting, hard exercise, in short, that they bend all efforts to report in the best of condition. But warn against extremes. Some men will be so anxious to make a good showing that they will report too "fine" and then you'll have a problem of keeping them from going stale when the strenuous workouts start.

### BASKETBALL

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

### BASEBALL

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

and pliability of these muscles and prevent "glass-arms," which are generally due to misuse of unconditioned muscles.

### TRACK

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

### SWIMMING

The best conditioning exercise for swimming is swimming.

### COACH OR TRAINER

Success in handling athletes and obtaining the right results depends to a great degree on the personality of the coach. He must be dynamic, vigorous, trim in body, alert physically and mentally. With few exceptions coaches are ex-athletes and thus start out with the right kind of physical equipment. To retain his strength, pep and agility he must keep up athletic activity. A coach should not permit himself to degenerate into a flabby, pot-bellied, mushy-faced and bleary-eyed travesty of a man. One cannot expect his charges to pay much attention to his preachings, if his appearance belies them.

## CHAPTER X

## FOOTBALL

The season is on. If your efforts to stimulate interest in pre-seasonal conditioning have been successful, you will have most of the boys back in pretty good shape. A few will be too "fine", having worked too hard throughout the summer. Still others will be soft and pudgy. Let us assume that as a whole the coach has reason to be pleased with the condition of his squad and is able to start right in building up his playing machine. To the trainer the football season with its numerous problems of conditioning and treatment of injuries, is a period of great responsibility and anxiety.

**First Day Out**—Have a weight chart ready and instruct the candidates for the team to record their weight, going out to practice and again after the shower. The daily fluctuations in weight are an excellent indicator as to the condition of the man. Once a player is in "shape" he should hold his weight from day to day, no matter how strenuous the workouts may be. The average daily loss of weight varies from 3 to 6 pounds. Most of this weight is fluid lost in perspiration and is quickly regained. When the chart shows a persistent loss of weight on the part of a well-conditioned player, keep your eye on him. He is on a negative balance, burning up his own bodily tissues, and one cannot keep that up for long. Find the cause and remove it.

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

As soon as is possible following the opening of the season get the squad together and tell them exactly what you will expect of them in the way of training "do's and dont's".

One of the most important problems facing us at the start of the season is the care of the feet, which must be toughened to stand terrific wear and tear. The feet should be soaked in cold brine for about 5 minutes, thoroughly dried, and then painted with any one of the following medications:—Tincture of Benzoin, Alum solution, Tannic acid solution, 1% Formaldehyde solution, or rubbing alcohol. All of these are effective astringents and will serve to toughen the skin. After you have allowed the medication to dry, powder the feet or the sox with talcum or the common foot powder made up of Talcum, Boric acid and a little Tannic acid. Zinc stearate is also excellent for the purpose, the aim of all these powders being to lessen the friction of the new sox against the tender skin. The toe nails should be clipped closely and properly, i.e., slightly hollowing the middle of the nails.

Start bandaging the ankles as soon as the first few days of preliminary "warm-ups" are over. You have probably made your choice of the bandage you will use during the season. If you chose the Figure of Eight

ankle roller bandage, give a pair to each of the candidates and show him the correct way of putting them on. Warn the boys that a loosely applied support is worthless. After the bandages are on, have them put on their sox and shoes before they walk around, to avoid loosening of the bandage.

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

Zinc Oxide ointment. Saturday at ten a.m., the ankles are re-taped. Be sure to use roller gauze bandage to "fix" the adhesive. The gauze should be removed when the men are back to get dressed for the game.

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

At the start of the season the men beside following out the routine of training laid out by the coach, must spend about half an hour a day in special toughening-up drills. It will be found that most injuries afflict teams at the start of the 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 are of inestimable value to the team. As a rule every coach has some favorite system of his own for conditioning his men and this should be carried out with diligence and progressively increasing intensity.

Personally, I am in favor of a simple calisthenic drill, consisting of two or at most four-count exercises, easily executed and chosen with an eye to the specific requirements of football. Fancy drills, complicated Swedish movements, gymnastic stunts that may be meat for Socols or Turners—all these are a

great waste of time when used to condition football men. And I am saying this well aware of the fact that one of our most successful coaches has put his approval on these Swedish exercises.

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. Waddling, duck fashion.
9. Take deep knee-bending exercises to strengthen the knee joint. Also rising on toes exercise for the ankle joint.
10. Pair men of equal weight and have them playfully wrestle, with much tumbling. (On the hard ground, of course).

On scrimmage days—Tape the hands of the linemen and protect well all injured parts. Black tape (friction or "bike" tape) is quite effective for the purpose and more economical than white adhesive. The Spica Cloth Hand Bandage (see under Bandaging), is just as effective and still more of a saving. Insist that every man on the squad, irrespective as to whether he is a back or a lineman, have some sort of a shin

protector. The sea-foam or the sponge rubber strips are very light and quite effective for the purpose. If there are any bruised hips or old "charley's" on the squad, make sure they are well protected.

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, "hot stuff," or mild capsicum ointment. These limit the loss of bodily heat. Of course, these lubrications also stuff the pores and prevent perspiration but the latter is the lesser of the two evils. After the workout use plenty of soap to wash off the "grease."

Canvas coats lined with sheepskin or felt should be an adjunct to every training department and, when a player, for some reason, is forced to stand on the side lines, he should put on one of these. I am very much in favor of wearing sweat shirts under the canvas coats. These shirts cling to the perspiration-soaked jersey and thus prevent too rapid evaporation. They are economical and durable and come in handy in many ways. If a man does manage to contract a cold, attend to it immediately. Break it up with a steam bath and a laxative.

On the field, during practice or a contest, have handy a pailful of oatmeal water, prepared by soaking for one hour a glassful of rolled oats in a gallon of water. Allow the men to moisten their mouths by taking a gulp of it. Plain cold water may be used but the oatmeal water is to be preferred since it has the quality of keeping the mouth moist for some time. Under no circumstances should the players be allowed

to drink water during the practice session or during a contest. After practice they may drink all they crave, but in moderate quantities at a time. Drink only cool water, not cold. It may not be as tasty as a cold drink but it will serve the purpose of allaying thirst.

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. Rip the seams if necessary. Examine the injured part thoroughly, make a careful diagnosis and apply the treatment indicated. If the injury looks suspicious—if you suspect that it may turn out to be more serious than it appears to be—play 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. Keep an ill man off the field.

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 24 inches in width. With table sufficiently low, the masseur or rubber is able to use the power of his shoulders and back, to help his arms and hands. Whilst if the table is high, he can use only his arms and that soon tires him out. The tables can be 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 canvas covers may be used for head supports.

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

he realize he must earn every cent he gets by doing his best for the team.

The assistants should heed the complaints of the athletes and report these immediately to the head trainer, for the average athlete is very lax in reporting injuries (there are men of the opposite extreme, always complaining of something or other) or symptoms of an ailment and failure to do so may delay treatment and incapacitate the man at a time when he is most needed. The rubbing should be done with plenty of snap but very little force. The object in rubbing an athlete is not to macerate and bruise him but merely to loosen the muscles and increase the circulation. There is no estimating the harm that an ignorant rubber can do to an athlete. A hard massage or a hard rub is the equivalent of a strenuous work-out and the athlete who had just gotten through two hours of strenuous practice is hardly in shape for another dose. A snappy rub stimulates and reinvigorates the athlete, whereas, a slow, draggy, half-hearted rub leaves him tired.

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 wide-

spread 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.

The training room should be thoroughly disinfected at least once a week in order to avoid sudden epidemics of infections. If you do run into an epidemic of boils, tonsillitis, etc., go at it hard.

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

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

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

The men should be well cooled off before rushing out into winter breezes. A sweaty body is subject to "colds." Dry thoroughly, not forgetting the hair, then fan your body with the towel in order to cool off.

As the season progresses the approximate line-ups of the first and second teams become apparent. These

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

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

1. Effleurage (stroking); friction (circular rubbing); kneading (shaking, twisting, etc.); and percussion (slapping, beating, hacking and cupping) are applied in the order given to (1) limbs, (2) chest, (3) abdomen, (4) back.

Since the time available for a football rub is rather limited, less attention is paid to the technique of massage than might otherwise be done, the main object being to stimulate circulation, thereby hastening the removal of the fatigue poisons and to reinvigorate the tired muscles. The kneading and percussion movements predominate, the former serving to loosen the congestions of waste matter and the latter acting as the invigorating medium.

A popular rubbing mixture used by most trainers has the following composition: one quart medicated alcohol (never use denatured or wood alcohol, which is a dangerous poison, whether used internally or externally); add a teaspoonful of Oil of Wintergreen or Oil of Peppermint and shake well to dissolve the oil; mix with three quarts of Witch Hazel and a few drops of Iodine. This makes an invigorating, sooth-

ing, warming and antiseptic rub-down liniment. It is inadvisable to use alcohol alone, since it evaporates easily and in doing so causes the loss of much bodily heat, leaving the body chilled and uncomfortable. This objection applies, of course, only to seasons of the year when conservation of bodily heat is advantageous. Alcohol should be used for reducing fevers.

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

The men must be impressed with the importance of reporting injuries as soon as they occur. Attend to these at once. Nothing will go away of itself. Be patient with injured or stale men. They are often cranky—ill-temper is a by-product of disease. When a man is forced to stay out of play on account of an injury, give him daily body massages to keep his muscles in the best of condition. If, however, the injury is such that it will not prevent the athlete from taking active exercise, then there is no doubt that the latter is preferable. If he is able to run signals, protect the injured part well, and send the man out.

During the football season the men should report at the training quarters Sunday afternoons and be given a full body massage with warm olive oil, followed by a shower and a percussion douche. This will greatly help in relieving fatigue, re-invigorating the athletes and preparing them for the strenuous week ahead. Incidentally particular attention may be paid to those injured or ailing in any way. Some coaches favor a

3 to 4 mile hike on Sundays to work out the stiffness caused by Saturday's game. I think a massage and rest more effective.

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

The more nervous the individual, the earlier should he eat his pre-contest luncheon. There is no cure for nervousness except self-control. A certain amount of "edge" is an absolute necessity to an athlete. The phlegmatic individual rarely reaches heights in competition. He may have more than average "natural" ability but he is never capable of exceeding this apparent capital. The neurotic, on the other hand, is full of potentialities. The greater the stress, the greater his response. That is why "nervousness" is a distinct asset but pre-game nervousness must be curbed and suppressed or it will wear the man out. The remedy lies in the individual. He must compel himself to keep his thoughts off the coming contest by shifting to some pleasant reveries. He needn't bother about that shivery feeling of anticipation which seems to fill every fibre of his body but he must not think about the game until game-time.

In the course of the game, the trainer, running out on the field of play, should carry along a well equipped first-aid bag; a pail of cold water with a sponge or two in it to be used in restoring a "shaky" player; a few dry towels, especially on wet days (impress on the men the importance of drying the hands thoroughly after handling a wet sponge); plenty of powdered rosin or whatever anti-fumbling mixture you favor (Tincture of Benzoin, molasses, shellac, tar, or mixtures of these); and a cool head. Many schools

send along an assistant, carrying a tray full of paper cups, each containing about two ounces of cool but not cold water, allowing the men to swallow that amount if they are thirsty. A number of big schools are using orange juice instead of water and I think it is a pretty wise stunt. The trainer must remember not to talk shop to the men. It is against the rules and in a tight game may mean a disastrous penalty.

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

Between halves have the men lie down. Remove helmets. Loosen belts. Stretch out comfortably. Relax to the utmost. Wipe their faces with towels soaked in ice cold water and then dry thoroughly. A cold towel on the forehead helps to normalize the circulation, clear the head and invigorate the man. Hot beef tea may be served, a cupful to each man. Some favor giving an orange to suck—not to eat. The trainer should pay most attention to those who need it most. If a man complains of a sick stomach, which is a rare occurrence in football, give him a teaspoonful of aromatic spirits of ammonia 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. Following "wet" games look out for "colds."

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.

At times, when it is clearly apparent that the team has been over-worked and on the verge of staleness, it may be the best policy to allow the whole squad to break training for a few days. Even if things are running along smoothly an occasional break for a day or so may do the team a world of good, if only by relieving them of the more or less tedious daily routine. Some coaches relax their training rules slightly after games.

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

All meals should be served promptly. There must be no waiting for service. I have always made this a point to be taken up with the hotel management. After the meal the men should rest for about an hour. Then a short walk may be taken to break the monotony of waiting. Do not permit sight-seeing before a contest. Encourage all forms of spontaneous entertainment. If there is any musical or vocal talent on the squad a fine time to bring it out is the night before the game, right after dinner. It will do no harm to take the boys to a show for an hour or two.

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.

Inspect the field of play from time to time. Treacherous holes should be filled up.

High school coaches will find it helpful to have one or more student assistants in the training room. There is rarely any difficulty in getting candidates for such jobs.

## 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. Meanwell of Wisconsin advises the use of the cloth ankle roller bandage.

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 pepless 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 pepless athletes time and again and have always obtained good results. If a man feels chilly, rub a little "hot stuff" on his legs but not much of it, since it will "burn him up" when he gets going.

During the game be liberal with powdered rosin. Plenty of it on the hands will prevent fumbling. Dip the soles of the shoes in a basin filled with benzine or gasoline, which will serve to open the "pores" of the rubber soles (Allen). Follow by dipping the soles of the shoes in powdered rosin to prevent slipping and sliding, especially on waxed floors.

Have a bottle full of cold oatmeal water; permit men to gargle at every opportunity, since the dust and heat of an indoor court dries the throat rapidly. Wiping the face and hands with a cold, wet towel serves as an invigorant and should be used when "time out" is taken. But be sure to have dry towels around to dry hands thoroughly. All this paraphernalia can be kept on the side-line and the team instructed to hustle over to the spot when "time-out" is taken.

Fight for as many open windows as possible. The spectators may object at the start of the game but as things warm up they will welcome the fresh air. As for the players tearing along at top speed a plentiful supply of good, clean air is indispensable.

When a man is taken out in the first half to be sent back in the second, send him in for a cold shower and a change of clothing. Let him stretch out and rest until the second half is called. This may be inadvisable, since it prevents the man from making a study of the opponents' style of play.

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 discouraged, since its short stimulating effect is quickly followed by a depressing reaction. Some coaches distribute oranges, which should be sucked and not eaten.

After the game the routine is similar to that prescribed for football men: a short, snappy shower, followed by a brisk, forceful rub with a coarse Turkish towel—cool off—attend to injuries.

Similarly on trips the suggestions offered under "Football," will pretty well fill the bill in basketball. Stop in quiet residential hotels. Choose dry, clean rooms. Assign separate rooms or beds, if possible. Prohibit sight-seeing before contests. Choose the meals with care. A heavy breakfast, moderate dinner, a light meal about two and one-half hours before the game and a light luncheon following the game will

serve the purpose best. A nap in the afternoon will rest the men. A vaudeville show after dinner may be preferable, because it relieves the dragginess of the day and takes the mind off the coming game.

Protect your men from dangerous obstacles placed next to the floor of play.

### BASEBALL

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

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

### TRACK

It is quite generally accepted among trainers that trackmen are the hardest athletes to train. To a very large degree this can be attributed to the fact that the

sport itself is conducive to the development of temperamental, high-strung athletes. In track no man can do his best unless he is nervously "on edge." The regrettable thing is that this edge tends to persist even after competition. The trainer, however, must recognize that nervous tension is a quality indispensable to trackmen and their being exacting and irritable is an inevitable consequence.

Pre-seasonal conditioning is practicably indispensable for track men. The legs alone do not always carry a man to victory but the whole musculature of the body co-operates in giving him the necessary drive to win a race. Moreover, trackmen must be in the best of condition at the start of the season, since this sport makes strenuous demands on the vitality and nervous stamina of the athlete and starting the season with a good supply of both is bound to prove helpful. The candidates for the team should, therefore, start training systematically as soon as they return to school in the fall and apply themselves with diligence and earnestness to the task of attaining an all-around development. Particular attention should be paid to the upbuilding of the upper body and the abdominal muscles.

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

Massage with "hot stuff" and plenty of jogging are of aid.

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

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

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

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

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-ropes, 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 table-

spoonsful or more, according to the strength desired, of synthetic oil of wintergreen. The latter is an expensive drug and for the sake of economy "hot stuff" mixtures are frequently prepared by using ammonia, chloroform or capsicum.

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

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

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

For "come-backs," undress the man; rub his whole body with a coarse towel wrung out of cold water, dry him thoroughly, allow him to lie down, covering up to keep warm. A cold towel to his forehead may prove helpful. Just before his event is called give him a short, snappy invigorating rub with alcohol. Should the man show signs of lack of vitality or be to all appearances "peppless," give him a short cold shower, followed by rubbing with a dry Turkish towel, to assure a vigorous reaction. If a man vomits after a race, do not worry. The undigested, partly fermented food is better out than in. You will find that as a general rule the athlete will always feel better after

he has vomited. If he is nauseated or sick at the stomach give him one teaspoonful of aromatic spirits of ammonia and peppermint (a small bottleful of which you should be sure to have with you on the day of the meet).

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

In this respect I must relate an interesting experience. It was during the Milrose meet held at the Madison Square Garden last Fall that I happened to be in the training quarters of a big Eastern university. This particular team had a night on and were "cleaning up." As the runners came in sweated-up, tired, but happy, they found neither showers nor towels. Some proceeded to dress. Others made an effort to dry themselves with their sweat shirts. I noticed particularly one slim little fellow who had run a great half-mile and looked pretty well petered out. A boy in that condition must be taken care of. No one did anything for him except to offer hearty congratulations. As I saw the youngster trying wearily to dry himself and thought of the chilly winter breezes outside, I wondered what the results would be. Yet the boys were in charge of a well paid trainer. It is evident that someone either wasn't on the job or knew no better. Moral: take care of your boys if you expect them to do their best for you.

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

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 XI

### DIAGNOSIS AND TREATMENT OF ATHLETIC INJURIES

Be careful.

Be clean.

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

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

Be considerate—as far as is possible.

Know your limitations.

Diagnose with care. No "shot-gun" conclusions. When an injury occurs get a good history of what happened. Just how did he fall? Did he feel anything "give," tear or crack? Did he ever have anything like this before, etc.?

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

Don't fool around with fractures or dislocations.

When in doubt pass the buck to your medical adviser.

Too much treatment is worse than none. A short time ago a clever trainer sent a case to me because it had failed to respond to all his ministrations. On checking up his methods I found that they were correct. Examination of the patient showed the injury at a

standstill. It was clear that something was interfering with the body's efforts to restore normality. I recommended discontinuance of all treatment for a few days. After that the injury healed rapidly.

In any injury calling for immobilization, massage the surrounding muscles daily to prevent atrophy, which always follows disuse.

Don't be too anxious to rush an injured man back into the fray. You may aggravate a healing injury and permanently disable the player. It is well to remember that we owe a moral duty to the boys placed in our care.

Don't pay attention to every Tom, Dick and Harry when an emergency arises. The cheapest thing on the market is advice from onlookers. I usually shut them up with a sharp order to "keep quiet or get out."

Follow the routine of treatment you are sure of. The outlines of treatment in the following pages are reliable, practical, effective. It is the cream of all there is on the treatment of athletic injuries.

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

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

Be economical in the use of first-aid supplies.

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

The more experienced the physician or trainer in the treatment of injuries the less does he believe in

rest or immobilization of an injured joint. The effusion which pours into a joint following an injury either disintegrates and is carried away by the lymph and blood vessels or becomes organized into adhesions. At first, the latter are thin and fragile and easily broken up. Even on the day following the injury you will find that in moving the joint you will have considerable resistance, some pain and if you persist in bending the joint there will be a lot of crackling and snapping of the bands of adhesions. The more prolonged the immobilization the greater the number and the stronger the adhesions and if you rest an inflamed joint long enough you get complete ankylosis (lack of motion in a joint). Additional vital objections to immobilization are: the atrophy of muscles, which sets in almost immediately on cessation of movement and more or less contraction or shortening of the muscles. Finally, a joint which is being used tends to return to normal much sooner than one at rest. In summary: in the treatment of athletic injuries we must avoid prolonged rest and immobilization. A day's rest will do no harm. But after that, start passive movements, massage, etc., and if at all possible, active use of the limb.

## DISLOCATIONS

Dislocations of joints are not infrequent among athletes. Whenever a joint is injured always think of a possible fracture or a dislocation. Check carefully to eliminate these possibilities before you conclude that you are dealing with a sprain. When in doubt, consult your medical adviser. Of course, an X-ray clears matters quickly but we are rarely in position to take X-rays every time an injury occurs. The history of what happened will help you greatly. The severity of

the trauma is suggestive, for example, a very severe wrench of the knee joint is usually more than a mere sprain and it will be best to get an X-ray. Finally, you should know the symptoms and signs of dislocations and fractures "cold" so that you can determine their presence or absence.

The symptoms of a dislocation are: **deformity** of the joint outline with the head of the bone in an abnormal position, there being a depression where the head of the bone should be; **loss of function**—inability to put the joint through its usual movements; **rigidity** of the surrounding muscles; swelling, pain and tenderness. It is well to remember that a dislocation may be complicated by a fracture, especially in persons past middle age.

The first aim in dislocations is the replacement of the joint. A dislocation is a serious injury because it involves a more or less extensive tearing of the capsule of the tissues and reduction should not be attempted by any one who has had but little experience in first aid. Unskilled attempts at replacement may result in permanent disability or even a fracture of the bone. Reduction of a joint is not a difficult task but one that is technical—one must know just how to do it. If you have had the training or experience you are justified in attempting reduction.

Some dislocations are comparatively easily reduced. Thus, dislocations of the thumb, fingers, wrist or ankle, or even the shoulder joint can be safely replaced by any cool-headed first-aid man. The danger of harming the joint will be obviated if the trainer remembers the rule that in the reduction of a dislocation it is the steady, powerful pull and not the rough jerk that turns the trick. A dislocation or a fracture is immediately followed by a spastic contraction of the surrounding

muscles (the body trying to protect its injured limb). This rigidity must be overcome before adjustment is possible. Steady traction serves to tire the muscles, relaxation follows and one is frequently surprised at the ease with which the head of the bone slips back into its nook after the muscles let go. On the other hand rough jerking stimulates the muscles to still greater spasm. Vigorous efforts to overcome this increased tenseness may result in a rupture of the tendons or muscles involved. In conclusion, I repeat: pull slowly, steadily and forcefully.

I am listing the dislocations in the approximate order of their frequency of occurrence in athletics:—

**Thumb**—Pull the thumb with the right hand whilst pressing in the dislocated bone back into its place with the left. After reduction treat as a sprain, since in every dislocation the ligaments are sprained. Strap with adhesive. The following day bake and massage. Start bending the joint on the second day following the injury in order to break up any adhesions which might have formed. Persist in the after treatment until the joint is fully restored to normal.

In general, to reduce any small dislocated bone, pull steadily to overcome the muscle spasm and to stretch the joint, while trying to force the disjuncted bone back into place.

In rare cases the dislocated bone rips through the skin. This "open" type of dislocation is a serious injury because it opens an avenue for the entrance of germs. Pour Mercurchrome into the wound before attempting replacement and watch the part carefully for a number of days for the development of an infection.

**Shoulder**—The head of the humerus may dislocate in any direction except upward but in 90 per cent

of the cases it is dislocated downward, forward and medially and may be found lodged under the outer part of the clavicle. The rotundity of the shoulder is gone and it appears caved in.

The easiest method of replacement is the following: patient prone on the ground, the operator removes the shoe and places his foot in the arm pit of the affected side. Taking a firm hold of the patient's hand and wrist, he pulls the arm forcefully but steadily for about a minute. He then combines the straight pull with carrying the arm towards the body while rotating it inward. The head of the bone will be heard to slip back with a distinct snap.

There is another method, recommended by all instructors of minor surgery and that is the Kocher method. It, no doubt, is just as effective but its technique is far more difficult to grasp and my experience has been that in a pinch everyone tends to use the simplest possible method.

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.

The after treatment of shoulder dislocations is vitally important. Careless treatment will yield a weak joint, subject to chronic dislocation—"slunk shoulder."

Since a dislocation is always accompanied by a sprain of the surrounding ligaments, it should be treated with hot applications (diathermy, Infra-red, baking, Arc lamp, hot fomentations), massage and progressive exercises, which at first should be passive and later resistive. After replacement, strap with adhesive for one day. Remove the adhesive and apply heat, light massage and passive motion to break up adhesions. The vibrator will be found quite useful for the latter purpose. Don't start active exercise too soon—give the torn capsule plenty of time to heal.

**Recurrent dislocation of the shoulder**—I believe I have seen more of these "slunk shoulder joints" than primary dislocations of the shoulder, while I was a trainer. In all probability the boys had the initial dislocation while in a high school, where the training and care of the boys is less intensive and the after care almost an impossibility. From time to time I receive letters from coaches asking for advice in preventing recurrent dislocations to enable them to make use of a promising athlete. In reply I have always emphasized the value of resistive exercises of progressively increasing difficulty. Function makes structure and if we persistently make a demand on the body the latter will respond by strengthening the part. But a program of this type is not a matter of weeks but of months of persistent application.

As an additional safeguard it is advisable to strap the shoulder joint Gibney fashion (see under Bandaging) with the horizontal layers rather low on the arm in order to limit motion in the antero-posterior field. Again, Lowman suggests a special restricting bandage, which should be quite effective. A strip of adhesive about 2½ inches wide is placed around the chest at the level of the junction of the lower ribs and

the sternum. A strip of leather about 8 inches long and  $\frac{3}{4}$  of an inch in width has both ends tacked on to the adhesive, so that the leather is right under the armpit fixed as a loop. A band of adhesive about 3 inches long is strapped around the upper arm at about the middle of it. To this adhesive is tacked on a leather loop, which is laced over the chest loop and is made to glide forward and backward as the arm moves. Since the chest loop is short the arm loop will be arrested whenever the forward movement of the arm passes an imaginary safety point. Specially fitted woven elastic supports are popular with some trainers for the protection of a "slunk" shoulder.

**Wrist**—Grasp the affected hand firmly with your right hand and pull steadily while rotating slightly. With your left hand press the dislocated bone back into position. Following reduction treat as a sprain. Partial dislocations of the small bones of the wrist, when disregarded, may cause permanent stiffness (ankylosis) of the joint.

**Ankle**—With your right hand grasp the foot firmly around the arch. Your left hand should get a solid hold of the back of the foot and the heel. Pull steadily and forcefully while slowly rotating the foot and forcing it into normal alignment. If unsuccessful, place the foot in very hot water and try the same procedure as soon as the muscles relax. 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; have an assistant hold the thigh while you grasp the foot and pull steadily upward, rotating it gently.

**Knee**—Place the patient on his back. Your assistant grasps the thigh and pulls upward away from the joint. Grasping the foot firmly, apply steady, powerful traction for a few minutes. As you feel the muscles

relax slowly rotate the leg. An alternative method is to flex the knee as far as is possible, place your right hand under the calf, close to the popliteal space, and pull upward, away from the joint, while your assistant pulls the thigh in the opposite direction. Now, by gently rotating the leg, you can effect a reduction.

**Elbow**—The usual type of elbow dislocation occurring in athletics is the backward displacement of the heads of both the ulna and the radius. To replace:—patient sits in a chair; rest your flexed right leg on the chair, place your knee in the bend of his elbow; grasp the forearm firmly and pull steadily until the muscles tire and let go, when the bones will slip back into place. An elbow joint dislocation is a rather serious injury and should be referred to the medical adviser. After reduction treat as a bad sprain.

**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.

### DISLOCATIONS OF TENDONS

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

**Long Tendons of the Biceps Muscle**—This tendon is located beneath the belly of the deltoid muscle and is enclosed in the sheath of the pectoralis major muscle (the big muscle of the upper chest). As a result of a violent wrench this tendon may tear through its sheath and "swim" around over the tip of the shoulder. Consequently, in any severe sprain of the shoulder, it is well to check up on the position of this tendon. The only way to diagnose this condition is by feeling the tendon snapping back and forth over the tip of the shoulder. To replace it in its groove, raise the affected arm to the level of the shoulder (sideways upward) and firmly grasping the hand, gently rotate the arm inward and outward. This will effect a reduction. Gently lower the arm to the side of the body and strap the shoulder Gibney fashion. The forearm should be carried in a sling. After 48 hours start treating with heat, massage and progressive passive exercises in order to prevent adhesions.

**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 on to its surface, occurs occasionally. It is generally a complication of a rather severe sprain. The diagnosis rests on the finding of a cord-like tendon slipping over the surface of the malleolus.

**Treatment**:—flex and evert (turn of foot while you force the tendon back into place. Place a felt pad over the groove and strap adhesive to hold it in place. Next strap the ankle in Gibney fashion favoring the outside of the joint. Raise the outside margin of the shoe by attaching a few thicknesses of leather, so as to throw the weight of the body to the inside of the foot. After 48 hours remove the adhesive, treat with heat, massage and slight passive movements. Persist in the treatment until it is apparent that the tendon is back to stay. As an extra precaution always strap the ankle when the athlete returns to practice.

**Tibialis Posticus Tendon**—Lies in the groove back of the internal malleolus and if displaced will be found on its surface. To replace, flex and invert the foot while forcing the tendon back into the groove. Apply a felt pad and strap Gibney fashion, favoring the inside of the joint. Raise the inside margin of the shoe with a few layers of leather. After two or three days start heat applications, massage and passive exercises.

**A Suggestion**—In all sprains of the ankle joint run your hand over both malleoli to make sure there are no tendon dislocations. Should the conservative method of treatment fail to permanently correct the dislocation of a tendon, an operation may be indicated. Such an operation is a comparatively easy one since the tendons are located rather superficially and are outside the joint. The results are bound to be satisfactory.

### DISLOCATION OF THE PATELLAE

Dislocations of the patellae are comparatively rare in athletics. Because of the looseness of the tendon of the quadratus femoris (the powerful extensor muscle

(the thigh) the patellae tends to slip to the other side of the joint catching over the projecting condyle of the tibia. This causes a very painful "locking" of the joint.

**Treatment**—Extend the leg fully and gently force the patellae back into position. Conservative measures are rarely effective in permanently correcting this abnormality since the slipping is due to a stretching of the tendon of the quadratus. We might try persistent resistive exercises in the hope that the increased demand on the tendon will cause it to strengthen and regain its normal tone. Strapping and special steel braces are useful in preventing recurrence.

### DISLOCATION OF THE SEMILUNAR CARTILAGE

Here is a condition which is met with rather frequently in athletics. A basketball player is tearing along at a mad clip when he suddenly drops to the ground groaning and holding out a stiffened knee. The latter is flexed at an angle of about 30 degrees and any effort to straighten the knee brings an agonizing protest. The knee is "locked".

Now, this may be the boy's first experience of this kind or it may be a not infrequent recurrence. If the former, he looks to you for relief; if the latter he will start telling you how to help him and you had better take his word for it—bitter experience is a reliable teacher. Those suffering from recurrent dislocations of the semilunar cartilages usually develop a method of quick replacement.

If relief depends on you, proceed as follows:—(we will assume that it is the right knee that is involved) place the patient on his back. Standing to the outside of his right leg, grasp the foot firmly with

your right hand. Place your left hand over the knee joint with the fingers pressing on any abnormal prominence on the side where the dislocated cartilage is.

(Note that in 9 out of 10 cases it is the internal semilunar cartilage which is dislocated. There are anatomical reasons for this disproportion.)

Now flex the knee as far as is possible. Then rotate the leg outward while abducting it at the same time—what you are aiming for is to increase the space between the articulating bones (femur and tibia) along the medial side of the joint. While holding the leg in this position of combined flexion, external rotation and full abduction, suddenly straighten the leg fully while pressing in the dislocated cartilage with the fingers of the left hand. The patient can help you by kicking the leg out at the moment when you are ready to extend it.

If at first you don't succeed, try, try again. The above is the right technique and it has never failed me whether in new or recurrent cases. Don't expect to feel the displaced cartilage—you most likely will not find it because it is rarely felt on the outside of the joint since the "locking" is generally due to the slipping in of the loose cartilage in the centre of the joint where there is no room for it. It is well to remember that the displacement is not corrected until the joint is fully extended. Even the slightest degree of flexion means that the cartilage is still misplaced.

The after-treatment is of vital importance. If the initial attack is properly treated there may be no recurrences. The cartilage has broken loose from its moorings and if we mean for it to become adherent again we must rest the knee completely for a few days. There is always more or less of a swelling of the knee joint (synovitis) and this must be treated with dia-

thermy, Infra-red, or wet dressings while the joint is resting peacefully on a molded back splint. You can start massaging the joint and the surrounding muscles on the second day following the injury. On the fourth or fifth day light passive movements only of flexion and extension may be added. About the end of the week strap the knee, apply a specially fitted steel knee brace and let the patient walk about. The inside of the shoe should be raised in order to throw the weight of the body to the outside of the foot and knee.

Do not be too hasty in returning the man into the game. It will be best for you to lay him off for the season in order to have a good man for the years following. Hot and cold applications, massage and resistive exercises will help in restoring normality.

When examining any severe sprain of a knee always keep in mind the possibility of an involvement of the semilunar cartilages, especially if the knee cannot be extended fully. I should have pointed out that the cause of the loosening and consequent dislocation of the semilunar cartilages is a severe wrench of the knee joint.

### FLOATING CARTILAGE OF THE KNEE

Floating cartilage of the knee is popularly known as a "mouse". It roams about the joint occasionally slipping in between the articulating surfaces and causing a momentary "locking". A "mouse" is generally a piece of bone or cartilage which is chipped off in the course of a fall. In its travels about the knee joint it apparently feeds on the synovial fluid, rounds out through constant friction, and slowly increases in size. No doubt, there is many a small "mouse" causing no symptoms at all, even though it does occasionally slip in between the articulating surfaces. The

"locking" caused by a "mouse" is more transitory and less painful than that caused by a dislocated semilunar cartilage. The patient is usually able to localize the "mouse" and frequently can manipulate it so it comes to the side of the joint where it can be clearly palpated.

**Treatment:** To relieve a "locking" of the joint, follow the same procedure as that outlined for the relief of a floating cartilage of the knee. In recurrent attacks the patient himself will usually know an effective method of obtaining relief. Swelling of the joint (synovitis) usually follows the "locking" and will require treatment. There is only one effective remedy for this complaint and that is an operation to remove the fragment. If you decide on that, go to an experienced orthopedic surgeon. The operation itself is a comparatively simple one but the after treatment is to my mind of greater importance than the operation itself, because we must aim to restore perfect functioning of the joint. That can be done as it has been done in thousands of cases but it depends entirely on intensive after treatment and I do not believe that a general surgeon, no matter how successful, can give you the effective after care that an orthopedic surgeon can.

If the athlete objects to an operation and chooses to carry on, try a special knee brace, which permits only antero-posterior and prevents lateral movement. This, of course, is only a palliative measure. Strapping a felt pad over the site of the "mouse" and raising the corresponding side of the shoe is effective in some cases.

## FRACTURES

Fractures are rather frequent in athletics. The trainer's responsibility is limited to the correct diagnosis, first aid and the after treatment to hasten the recovery of the patient. As a rule a fracture disables a man for at least six weeks. It takes at least that long to form a decent callus. Heat applications, massage and moderate use of the involved part stimulate the healing of a fracture.

There are three varieties of fractures:—

**Simple**—the bone being broken in one place.

**Complex**—the bone is broken in a number of places.

**Compound**—where the fracture is complicated by a jagged fragment of bone tearing through the soft tissues to the outside, causing a lacerated wound.

**Diagnosis:** In any severe sprain or dislocation of a joint always suspect a fracture. Your diagnosis relies on:—

1. History of the injury—the patient may have felt the bone snap.
2. Change of the normal contour of the limb.
3. Roughened or sunken outline along the surface of the bone, detected by tracing with the fingers.
4. Palpable jagged edges of bone, which are very tender to the touch.
5. False joint or point of mobility: grasping the limb on each side of the suspected fracture, bend it to and fro very gently. You may feel the "give" of the break or you may hear a crackling sound—crepitus.

If you are cool and deliberate you ought to have no difficulty in correctly diagnosing nine out of ten fractures. Whether you are absolutely sure or merely

suspicious of a fracture, do not attempt to move the patient until you affix temporary splints so adjusted as to make movement between the broken fragments of bone impossible. Use wooden planks, well padded with cotton wool, so as to make the splint fit the contour of the limb and prevent pressure wounds. Fix the splints in place with roller gauze bandages.

The replacement of fractures is a part of the physician's work. No doubt, a good trainer knows how to replace fractures but he ought not take the responsibility. If you will get hold of Scudder's text on "Fractures," you will find that replacement of fractures is far from the easy thing it appears to be. You may drag the limb into a "perfect" alignment, yet if you take an X-ray you will most likely find that you are all wrong. The more I have to do with fractures the more respect I have for them.

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

All the bones of the body are subject to fractures. Diagnosis is comparatively easy when the larger bones are involved but we need the aid of the X-ray to detect fractures of the little bones of the wrist or of the foot.

## FRACTURES OF

**Inferior Maxilla** (lower jaw)—

**Symptoms:** Unwillingness to use the jaw; irregular outline; crepitus.

**Treatment:** Refer to a dental surgeon for splinting with wire.

**Ribs:** May be merely cracked, partially broken or completely broken.

**Symptoms:** History of injury; pain on breathing or coughing; irregular outline.

**Treatment:** Strap tightly with adhesive.

Rib fractures are at times complicated by irritation or injury of the pleura of the lung or even of the lung itself.

**Clavicle:** Usually fractured at middle; rarely at either end.

**Symptoms:** Irregularity of outline; displacement of shoulder; jagged edges; crepitus.

**Treatment:** Sit patient on a chair, back to you; place your knee into the hollow between his shoulder blades; grasp the corresponding shoulder and pull it upwards, backwards and outwards while with the other hand you strive to approximate the fragments. Strap with adhesive aiming to hold the shoulder back. Bandage with muslin rollers to further "fix" this position.

In Fractures of Any Long Bone—diagnose, apply first aid and refer to medical adviser.

**Patella:** Usually split in two transversely.

**Symptoms:** Inability to extend the knee; fragments pulled apart leaving a gap; swelling, bloody discoloration and pain.

**Treatment:** Operation to unite fragments. After treatment important to prevent permanent stiffness.

**Spine:** Partial or complete fractures of the vertebrae.

**Symptoms:** Pain, immobility, paralysis, shock.

**Treatment:** Extreme care in lifting. Rush to a hospital. Consult a surgeon and a neurologist.

## SPRAINS

A sprain is caused by a more or less violent wrench of a joint, resulting in partial or complete tearing of the surrounding ligaments, blood vessels, nerves and the soft tissues. The characteristic symptoms are: an immediate swelling and bloody discoloration; inability to use the joint; sharp tearing pains.

In the treatment of sprains our first aim is to keep down the swelling to a minimum. Cold and pressure will do it. As soon as the injury occurs raise the limb higher than the rest of the body and apply a rather snug muslin or a woven elastic bandage, such as the ACE. Now plunge the limb into ice cold water for about ten to fifteen minutes. By this time all effusion into the joint should have been effectively arrested. Transfer the affected joint to a pan or pail containing very hot water, for about half an hour. Next remove the bandage and massage, using stroking movements in the direction towards the heart, aiming to drain out the effused contents about the joint. Firmly but gently. Finish by strapping the joint so as to enclose it in a snugly fitting corset, the aim of which is two-fold: primarily support of the torn ligaments and secondarily further prevention of swelling. It is well to remember that the healing process is delayed by the presence of the effusion. It follows that if we can keep the latter down to a minimum and get rid of it as quickly as possible, we can hasten recovery.

Over-night the patient may, with benefit, apply an electric pad, which should be tied on over the adhesive strapping. Some trainers use an Antiphlogis-

tine dressing instead of the electric pad. The following day remove the strapping and soak the joint in hot and cold water, alternately (five minutes in hot, one minute in cold) continuing the treatment for about an hour. Massage the joint, using stroking movements the length of the limb and circular friction (rubbing) movements with the fingers all about the joint. Very gently flex and extend the joint in order to loosen any adhesions which might have formed. Re-strap and send the patient home with instructions to favor but use the joint. Many a conservative physician will argue that rest is more effective than use, but any physician or trainer who has handled more than a handful of sprains knows better. Repeat the treatment outlined above, progressively increasing the intensity of the massage and passive movements, until the joint is back to normal.

In severe sprains examine carefully to eliminate a possible fracture. The blue-black discoloration which appears the day after the injury and persists for some time, may be ignored—it is due to the decomposition of the blood, which fills the tissue interspaces when the blood vessels are torn.

Physiotherapists will tell you that Diathermy is the "one" cure for sprains. My experience is that diathermy is just as efficient as baking or hot and cold applications in the treatment of sprains and by no means so far superior that the trainer who hasn't a diathermy machine need feel down-hearted. If you have a diathermy machine use it and if you haven't your results will be just as good.

**Sprain of Ankle Joint**—The most frequent injury in athletics. **Treatment:** After ascertaining that there are no complications (fracture, dislocation, displacement of tendons, etc.,) bandage the joint with a mus-

lin roller bandage or better still with a woven elastic bandage (ACE) and plunge into very cold water for about fifteen minutes. Transfer to hot water for 30 minutes. Massage with stroking movements toward the heart, while the leg is raised higher than the rest of the body. Strap Gibney fashion, following with a gauze roller bandage in order to "fix" the adhesive. Over-night apply an electric pad or Antiphlogistine. The following day repeat the procedure until the joint is well healed: soak the foot in hot and cold water alternately for about an hour; massage, at first gently, later gradually increasing the force of your stroking movements. Keep at the task of forcing the effusion out of the joint. Passive movements of increasing intensity will serve to prevent adhesions. Re-tape daily. The athlete should use the foot, with the aid of a cane, if necessary.

**Sprain of Big Toe**—Same routine of treatment: cold, heat, strapping, massage.

**Sprain of Knee Joint**—Sprains of the knee joint are next in frequency to those of the ankle joint. The differential diagnosis is of great importance. Any severe wrench of the knee should call for a most searching examination to make sure that there is no fracture or dislocation of the semilunar cartilages. The diagnosis rests on: the history of the injury, inability to bear weight, tendency of the knee to cave in to the affected side, more or less swelling, discoloration. A very tender and painful spot can be localized just below the patella on either side of the joint, indicating the seat of maximum laceration of the ligaments. The affected ligament (internal or external laterals) may be over-stretched or partially ruptured. If improperly treated permanent relaxation of the ligament may follow. This is the chief cause of the many cases of weak

and wobby knees, which we so often meet with in athletics.

**Treatment:** Tie a number of sponges about the involved knee joint with a woven elastic bandage. Now pour very hot water (as hot as the patient can bear) on the sponges. The combined pressure of the distended sponges with the heat makes an excellent remedy for knee sprains. After about three-quarters of an hour of this, massage the joint using only stroking movements towards the heart. Apply an anti-phlogistine bandage over-night, placing the knee on a posterior molded splint in order to immobilize it. The following day repeat the hot and cold applications, followed by massage and strapping of the joint. Raise the shoe on the side of the injury so as to further support the torn ligaments. Encourage the patient to use the joint. Diathermy and baking are favored by many trainers.

**Sprain of the Back**—Must be differentiated from a number of conditions which give similar symptoms, for example, "lumbago," sacro-iliac sprain, etc. The history of how the symptoms developed is consequently of vital importance in making a correct diagnosis.

With no history of an injury, the athlete may complain of a painful stiffness in the small of the back. This is "lumbago" or acute myositis (inflammation of a muscle) attributed to a collection of toxins in the substance of the muscles which serve to inflame the latter.

**Treatment:** Prolonged application of heat (diathermy, baking or Infra-red) followed by a pretty rough massage to break up the deposits of the toxins. The application of mustard plasters, an electric pad, or antiphlogistine over-night is bound to hasten recovery.

**A Simple Sprain of the Back** can generally be traced to a definite wrench which leaves the patient with considerable pain in the "small" of the back. The treatment is similar to that of myositis, with strapping of the back between heat applications.

**A Sprain of the Sacro-Iliac Joint** (either the right or the left may be affected) may follow a rather severe wrench or the lifting of a heavy weight. The patient feels something "give" or "snap" and has a rather sharp tearing pain, which lasts for about 15 minutes. He may feel comfortable for some hours but gradually the pain returns growing progressively more intense. The patient begins to favor the affected side. On examination, you find that in bending forward he keeps the lower spine rigid, bending from the hips. If you ask him to bend sideways you will find that the muscles close to the spine on the affected side remain in a spasm, whereas normally they would tend to relax. This is due to the effort of the body to protect the site of injury. As you palpate (feel with the fingers) the sacro-iliac joints, you may find that the affected joint is rather prominent and quite tender to touch. The pain may radiate down the corresponding leg because of pressure on the sciatic nerve of that side. The displacement of the sacro-iliac articulation varies greatly and it stands to reason that the more displacement the more intense the symptoms.

**Treatment:**—Try the manipulative adjustment described below. Then strap tightly with adhesive.

It has been my experience and I have no doubt most trainers will say "Ditto!" that the lower part of the spine is subject to slight subluxations, which give rather indefinite symptoms of discomfort, tenderness, mayhap some pain and limitation of motion—a combination of symptoms which cannot be clearly diag-

nosed. In such cases I always try a manipulative adjustment, which I am going to describe below and which has brought permanent relief so frequently that I have concluded that these symptoms are due to subluxations either of the vertebrae or of the sacro-iliac joints and that the adjustment I use is an effective method of restoring normality.

**Technique:** Patient is lying on his right side, with the right leg fully extended and the left knee flexed; the chest leaning slightly towards you. You have previously applied Infra-red heating to the lower spine in order to relax the muscles and the ligaments thoroughly. Placing your right hand on the patient's left thigh and your left hand grasping the patient's left short ribs, smoothly and steadily swing the thigh backward, while you stretch the upper body towards you. At some part of this movement you will hear a distinct snap. The movement should be repeated four or five times to thoroughly loosen the joints. Do not jerk and do not use force. Have patient turn to his left side and repeat the same movements. Now, whether we believe in subluxations or not, the fact remains that this adjustment has relieved many an aching back—and that's what we are after. I have used the same manipulation and a number of others in the treatment of sacro-iliac sprains, with very satisfactory results.

( **Sprains of the Thumb**—Are the nemesis of many an athlete and especially of basketball players and boxers. The routine of treatment, which includes heat, massage and strapping, should be followed with diligence. If you do not, the joint tends to remain swollen and tender because teno-synovitis (an inflammation of the tendon sheets) develops and in many cases ankylosis (permanent locking of the joint) follows.

The initial injury should be treated with a generous antiphlogistine application. The following morning soak the thumb in hot and cold water in alternation for an hour or so, follow with a massage and light passive movements. Strap with adhesive and instruct the athlete to soak the thumb in hot water at every opportunity. Continue treating the injury until the joint is normal.)

**Sprain of the Wrist**—Make sure there are no dislocations or fractures of the small bones of the wrist. **Treatment:** Heat, massage, strapping. Apply Anti-phlogistine over-night to hasten the healing.

**Sprain of the Elbow**—("Baseball elbow" or "Tennis elbow")—Sprains of the elbow joint due to direct violence are rather infrequent. Most commonly they are due to the peculiar twist used by pitchers in delivering curves and drops, which may strain the tendons and ligaments attached about the elbow joint. Routine treatment with a rather prolonged rest. To avoid a "baseball elbow" pitchers and tennis players should go through the motions of delivery of a ball with gradually increasing intensity. That is why pre-seasonal conditioning is of value to pitchers.

**Sprains of the Shoulder Joint**—There are a number of different injuries of the shoulder, which give symptoms similar enough to justify extreme care in the examination in order to make a correct diagnosis. Because the differential diagnosis is so important I am listing below most of the athletic disabilities of the shoulder joint, even though some of them are not "sprains."

1. **Sprains of the Shoulder Ligaments**—Are generally due to a fall on the hand or the elbow. The outstanding symptoms are: more or less swelling about the joint and pain on moving the shoulder. 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, strapping. After two or three days add passive movements.

2. **Sprain of the Long Tendon of the Biceps—**("Baseball Shoulder")—This strain rather than sprain is due to the violent throwing motion. The outstanding symptom is that of pain and more or less weakness in the throwing arm. There is no swelling. This type of injury must be differentiated from a dislocated long tendon of the Biceps. The treatment is, rest combined with heat, massage, faradic or sinusoidal applications followed by progressive exercises to condition the arm.

3. **Sprains of the Acromio-Clavicular Joint—**Are probably more frequent among football players than sprains of the shoulder joint proper. There is extreme tenderness and pain at the "tip" of the shoulder where the joint is located. The injury is very slow in responding to treatment. Use heat, strapping Gibney fashion and passive movements. It may be advantageous to carry the arm in a sling for a few days to relieve the tension on the shoulder ligaments.

4. **Nerve Bruise of the Shoulder—**Injury of the Suprascapular nerve occurs far too frequently in football. This nerve may be roughly located just beneath the central depression of the shoulder. When injured the nerve becomes inflamed causing a trail of symptoms which are persistent and troublesome. The shoulder is very painful and the athlete holds the arm almost immobile. We are dealing here with a neuritis (inflammation of the nerve) and heat and the galvanic current are our best aids.

5. **Acute Bursitis** (either of the Subacromial or the Deltoid bursae—see under Anatomy)—This is probably a more common injury than actual sprains

of the shoulder joint but is rarely diagnosed correctly because so few trainers know much about this condition. The cause of the inflammation of the bursae is trauma, such as occurs in a hard fall on the side of the shoulder or a fall on the elbow, which jams the shoulder upward or finally a blow, landing close to the tip of the shoulder, etc. The symptoms are: a feeling of tension at the shoulder. More or less pain increased on movement and consequent unwillingness to use the joint, patient carrying the arm stiffly at the side. As the days progress adhesions form and there is limitation of mobility because of them. An X-ray may help in the diagnosis if the bursae is distended.

The treatment consists of the application of heat (diathermy preferably); massage and passive exercises tending to bring back the normal movements of the joint. Because motion causes pain the patient tends to keep the affected arm by the side of the body. As a result of this voluntary immobilization adhesions form. The trainer should prevent this by persistently using passive movements, such as gradual extension of the affected shoulder forward upward and sideways upward. Raise and lower the arm bit by bit until you have carried it through its full range of motion.

If limitation of motion is pronounced it may become necessary to break up the adhesions while the patient is under an anesthetic. With the patient etherized the affected arm is forcefully carried forward upward and over head with the right hand, while the fingers of left hand press down on the head of the corresponding humerus in order to fix it in its capsule and thus prevent dislocation or a fracture. At some part of this movement there can be distinctly heard the ripping of the adhesions.

6. **Neuritis of the Brachial Plexus** or one of its nerves—The characteristic symptom is an almost constant aching pain radiating down the course of the nerve in the arm. If you pass your finger along the nerve you will find it quite tender to touch. There is a loss of function of the muscles supplied by the affected nerve and in time atrophy of these muscles because of disuse.

**Treatment**—It is essential to find the cause of the neuritis and remove it (the usual causes are: exposure to cold, injury or toxins). Treat with heat applications and sinusoidal current. Massage is useful in preventing atrophy of the muscles but the nerve should be avoided when massaging.

With all the above conditions and fractures and dislocations as possibilities the trainer has to be pretty alert when handling injuries of the shoulder. It is safe to state that he will quite frequently be incorrect in his diagnosis. However, since the routine of treatment is pretty much the same for all these injuries, it really is not a matter of very great importance whether the trainer makes the correct diagnosis or not. Where the injury fails to respond to treatment consult your medical adviser and an osteopath.

### RUPTURE OF MUSCLES OR TENDONS "PULLED TENDONS"

Any part of a muscle or a tendon may be partially or completely torn by a violent wrench, twist or a forceful extension of the muscle while the latter is still flexing.

The muscle fibers may be ruptured in any part of their course. "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 predispose to "pulled tendon" are: the season of the year, the temperature of the air, want of fitness, type of sport and failure to "warm-up" sufficiently.

**Symptoms:** In the course of a burst of speed the athlete suddenly drops to the ground complaining of a severe tearing pain in a limb. He will tell you that he felt as if a bullet or a whip or a stone struck him and that he had the sensation of something tearing. Examining the site of the injury you will note the swelling and bloody discoloration, the extreme tenderness when the part is touched, inability to make use of the affected muscle and if you manage to contract the muscle by passive movement you may feel a gap between the torn parts of the muscle. If it is the tendon and not the muscle that is torn, you will not see as many signs of the injury and will have to depend on the history and the disability to make your diagnosis.

**Treatment**—Of course, you consult a physician, preferably an orthopedic surgeon. An osteopath will do you but little good here. You will try to approximate the torn fibers by placing the limb in a position most advantageous for the purpose. You will strap the limb so as to support the torn fibers. Heat, in any form, should be applied frequently and in prolonged doses in order to stimulate the quick absorption of the effusion from the torn blood vessels and hasten the healing. Massage may be started on the 2nd day following the injury and light passive movements on the 4th or 5th day in order to prevent the formation of adhesions. The use of heat, massage, passive movements and strapping for support should be persisted in week after week. As the patient im-

proves and begins to use the limb, increase the severity of the massage and the exercises. Such an injury generally incapacitates an athlete for a long time. When he finally returns to training he must take care to "warm-up" carefully. A massage with "hot-stuff" should precede his going on the field. The wearing of woven elastic fitted supports is of doubtful value—I personally do not think they are any good. The woven elastic bandages (ACE) 8 or 12 inches wide are undoubtedly of greater value as a support. Either gives the athlete a sense of security.

**Rupture of the Semitendinosus Tendon**—This muscle, which runs along the back of the thigh (study carefully its origin, course and insertion in any Anatomy text) and whose function it is to flex the leg on the thigh, is the one most generally "pulled" in athletics, especially by trackmen. The usual symptoms have been outlined above.

**Treatment**—Put to bed. Strap the whole thigh with adhesive tape applied in circular horizontal layers, each succeeding one partially overlapping the preceding one. The tape should not reach clear around the limb but leave a gap about an inch wide in front of the thigh, in order to assure non-interference with the circulation. Porous plasters are advantageous wherever extensive strapping is indicated since they permit the evaporation of the perspiration and consequently the tape does not have to be changed often. An electric pad or a hot water bag should be applied over the strapping for hours at a time in order to keep up a vigorous circulation. Infra-red or arc lamp heat is excellent for this purpose.

The following day use heat applications with superficial massage. Three or four days later begin increasing the severity of the massage and start passive

movements to prevent the formation of adhesions. In about a week permit the patient to leave the bed and start using the limb. The heel of the shoe should be raised about three-quarters of an inch in order to prevent any tension on the weakened fibers. A cane or crutches may be used as an aid in getting about. As the weeks go by, the passive exercises should be given more forcefully. It will be months before the athlete is able to return to competition and then extreme care must be taken to prevent a recurrence of the injury. The athlete should use a support such as a woven elastic bandage and "warm-up" with care. At times it may be best for the athlete to lengthen the distance of the event in order to avoid the extreme tension incidental to short sprints.

**Rupture of an Anterior Thigh Muscle**—The Rectus femoris or the Quadriceps extensor muscles are not infrequently ruptured. The site of the injury is as a rule close to the knee joint. The tendon of the Quadriceps muscle may rupture at its attachment to the patella and may carry along a chip of the latter. The symptoms are those typical of a rupture, namely, the sudden collapse, sharp pain and more or less of a gap between the torn parts and inability to extend the knee.

**Treatment**—After consulting the medical adviser you will probably try conservative measures first. These include strapping, heat, massage, passive movements and complete rest for at least a week. If the rupture occurs close to the patellae an operation may be the only way of assuring normal functioning of the knee.

**Rupture of Ligamentum Patellae**—This ligament ensheaths the patellae and has two extensions: the upper one continuous with the tendon of the Quadriceps and the lower one, which is inserted into the tibia. The rupture may be partial or complete, above or

below the patella and almost always chips off a fragment of the bone. On examination you may find the patella drawn either above or below its normal position—depending on which part of the ligament ruptured.

If the ligament is completely ruptured an operation is advisable. The conservative treatment consists in immobilization with adhesive, heat, massage, passive movements.

**Rupture of the Calf Muscles**—The soleus and the plantaris tendons are susceptible to ruptures. Usual symptoms. Treatment: strap the whole length of the leg; use heat, massage and passive movements to restore function.

**Rupture of the Tendon of Achilles**—May occur just above its attachment to the os calcis (heel bone). Usual symptoms. Treatment: strap Gibney fashion, applying the bandage rather high up on the leg. Heat, massage and passive movements to restore function. The heel of the shoe should be raised about one inch. Patient should use the limb as much as is possible.

**Rupture of the Biceps Muscle or of the Long Tendon of the Biceps**—The belly of the muscle may tear partly as a result of a sudden severe wrench. The long tendon is occasionally torn off from its insertion to the scapula. Usual symptoms and treatment. The arm should be carried in a sling.

**Rupture of the Oblique Muscles of the Lower Abdomen**—I had four cases in one football season. The most prominent symptom is a tearing pain at the upper margin of the hip bone when the body is bent away from that side. Palpation will localize a tender and painful spot (which is not on the bone) which indicates point of rupture. Whenever you have an

injury in the region of the spine of the hip bone, it will be well for you to make a careful differential diagnosis. The condition may be:—

1. A simple strain or sprain of the oblique muscles of the abdomen.
2. A partial rupture of these same muscles near their attachment to the spine of the hip bone. This condition is popularly known as "Bowler's side."
3. A bruise of the upper ridge of the bone, which will be discussed later.
4. A possible deeply situated abscess, "pointing" outward.

Bearing these possibilities in mind you ought not to have any difficulty in reaching the correct diagnosis in order to apply the proper treatment.

The treatment of a rupture of the oblique muscles follows the usual routine: strapping to immobilize and support; heat, massage, passive motion.

## "KINKS"

The osteopath calls kinks "subluxations of vertebrae." A violent blow on some part of the spine or a wrench, leaves the athlete with a sensation as of something pinched, taut and quite uncomfortable. For lack of a more expressive term he calls it a "kink." I believe osteopaths are correct in claiming that these kinks are sudden subluxations of vertebrae, which are thrown out of their normal alignment with resultant pressure on the corresponding spinal nerve or nerves. The "kink" sensation is due to the tightening up of the involved ligaments and the pain to the pressure on the nerves. If you will press over the location of the "kink" you will find considerable tenderness.

**Methods of Adjustment:—**

**"Kink" of Upper Thoracic Vertebrae** — Have patient straddle a chair, sitting with his back to you. Place your bent knee in the hollow between his shoulder blades. With both hands grasp the corresponding shoulders. Suddenly draw his shoulders backward against your knee with a snap—but don't be too ambitious; it isn't a question of how much force you get into that backward snap but rather in the proper co-ordination and timing. If the movement is properly carried out you will hear a distinct snap and on examination will find that the tenderness in the region of the kink is almost gone and the patient is quite comfortable. No harm in trying a number of times if at first you do not succeed.

**"Kink" of Middle Thoracic Vertebrae** — Patient standing with his back to you. Let him place his hands in back of his neck interlacing the fingers and bringing the elbows close together in front of the chest. Step right up to the patient so that your chest touches his back. Place your arms around his and inter-lace your fingers in front. Spread your legs to a stride-stand. Expand your chest. Now, getting a firm hold of your patient lift him off the ground snapping his back against your chest. The whole movement par-takes of the nature of a "snap," rather than of a slow lift and stretch. It is the snapping of his spine against your chest used as a fulcrum that serves to straighten the "kink." You probably will not get this co-ordination at first but I can assure you it is a very easy and yet a very effective movement.

Another method of adjusting "kinks" of the thoracic vertebrae is the following:—

Place 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.

**HERNIA OF MUSCLE**

At times a sudden severe contraction of a muscle causes it to tear through the sheet of membrane which envelops it. When the patient contracts the affected muscle you will find a little "knob" arising at the point of rupture. On relaxing the muscle the tumor disappears.

If the condition is recognized and the muscle is immobilized in order to give the torn membrane an opportunity to heal, the hernia will disappear quickly. On the other hand if let alone and the muscle be used, the torn parts of the sheet tend to retract and adhere leaving a permanent rent. I have seen a number of athletes display "Watch this, Doc" herniations, which have become chronic giving practically no symptoms.

**"WRY NECK"**

The type of "wry-neck" met with in athletics is usually due to a "cold," a wrench of the neck ligaments or a blow. Symptoms: The neck muscles of the affected side are held tense and any effort to move them causes excruciating pain.

**Treatment**—Our first aim is to overcome the ten-

sion of the muscles and relieve the congestion. Heat will do both. Apply it in any form you prefer. I use Infra-red—any of the other forms of heat applications will do. When you get the muscles nicely relaxed, massage with olive oil or cold cream, gently for about 10 minutes. Next place the patient on his back and grasping the chin with your right hand and the back of the head with your left, slowly and steadily circumduct the head first to the right then to the left stretching all the neck muscles at the same time. Imagine that you are trying to pull the head off the shoulders but do it steadily not in jerks. Now rotate the head to the right and to the left. Then bend the head to the right and to the left. All these passive movements aim to stretch and loosen the neck muscles. You will find that as you proceed the tension in the affected muscles decreases. Rub in some "hot-stuff" and send the patient home. If necessary, repeat the treatment four to five hours later. As a general rule this routine brings relief. Should you fail, send the patient to an osteopath.

### 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 effect a union of the ruptured ones.

**Conservative Treatment**:—Use hot and cold fomentations (whenever strengthening is the object, use more cold applications than hot), massage and resistive exercises—the operator resisting by pushing while the patient tries to extend the flexed limb, and resisting by pulling while the patient tries to flex the limb. The

theory is that a demand being made on the body, the latter will respond by strengthening the ligaments of the weakened joints.

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

Steel braces are valuable aids for "loose" 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.

### "WATER ON THE KNEE"

We must differentiate two types of "water on the knee":—

1. **Bursitis**—An inflammation and swelling of a bursa (see Anatomy). Here the swelling, painless but annoying, is circumscribed, giving the impression of an inflated pouch projecting from some part about the joint. Bursitis is most common about the knee, elbow, shoulder.

2. **Synovitis**—An inflammation of the synovial membrane lining a joint with effusion of synovial fluid

into the joint. This fluid occasionally becomes infected and then the condition is a rather serious one. On inspection, the joint is seen to be distended, all the normal hollows and dents smoothed out. On palpating the joint one can feel the patellae floating on a little lake of fluid. There is but slight tenderness unless there is an associated injury which may be productive of pain and tenderness. The joint is held in semi-flexion, the patient resisting any effort to straighten it. This is the type of "water on the knee" most common in athletics. Bursitis is a rather rare condition. "Water on the knee" may follow a severe bruise, a sprain, a dislocation, a displacement of the semi-lunar cartilage, a "locking" due to a "mouse", etc.

**Treatment:**—Bitter experience will teach you that in "water on the knee" it is never safe to commit yourself as to the duration of the disability. Some cases respond quickly, others drag. The severity of the injury, the degree of internal trauma, the individual resistance and ability to regain normality, his conscientiousness in following the routine of treatment laid out for him—these are just a few factors that influence the progress of the healing process.

**Treatment:**—I am outlining a course of treatment which has proven successful in hundreds of cases. Almost every physician or trainer you meet will offer some favorite therapy of his own. It is up to you to weigh the suggestions critically and determine the relative values of the various treatments.

1. **Rest**—Synovitis is an acute inflammation and as such should be given a chance to subside. Absolute rest of the joint for a period of at least 24 hours is essential.

2. **Heat Applications**—These serve to increase the circulation in the knee aiding in the re-absorption

of the excess synovial fluid. Diathermy, baking, Infra-red, Arc lamps, hot applications, antiphlogistine dressings, electric pads—are of value in the approximate order in which I have listed them. Apply heat in any form you choose as soon as you immobilize the joint and place the patient in bed.

3. **Massage**—This should not be started until the second day. Stroke upward, driving the fluid towards the heart. Use firm, forceful pressure on the soft tissues—do not disturb the bones by twisting the joint. Graduate masseurs will tell you that they can cure a case of "water on the knee" using only massage. I believe they can—if given enough time.

4. Over night you may choose between an antiphlogistine dressing or a Whitelocke bandage (see under Bandaging) or you may combine both. Make sure that the joint will not be wrenched again during sleep by immobilizing it carefully.

5. Continue the treatment twice daily until the effusion is gone. When you send the man out for practice strap the joint with a woven elastic bandage or a para rubber bandage. In an emergency I would not hesitate to use a valued player who still has some effusion in the joint. If the latter will support him, I would bandage the joint and let the man go in. Practically no harm can be done since the inflammation is a simple one of a non-infectious nature. There is many an occasion in athletics when a man goes into a contest with an injury and is none the worse for it. Of course, it all depends on the type and severity of the injury. I have had many a football player go through a hard game with a knee full of "water".

The combination of rest, heat, massage and the Whitelocke bandage usually brings quick results and I have relied on this routine in most of my cases. How-

ever, every now and then a joint fails to respond to the above and then we try some of the following:—

**Bier's Hyperemic Treatment:**—Wind a para rubber elastic bandage about five to six inches above the affected joint, tightly enough to constrict the superficial blood vessels. This will cause more or less of a stasis of blood in and about the joint. Half an hour later, when the bandage is removed, a vigorous circulation will be set up in the joint which serves to carry out some of the effusion. The treatment should be repeated about every two hours.

**Compression Treatment:**—Wet a number of sponges and wring them out thoroughly. Apply these sponges all around the joint, fixing them with an elastic bandage. Have the patient pour hot water (as hot as can be borne) on the sponges in a steady stream. The sponges will become distended, acting as compressors, whilst the hot water will serve to keep up a vigorous circulation through the joint.

The question may arise as to whether the joint should be aspirated or tapped with a needle. The answer is:—under no circumstances should you permit aspiration of a simple synovitis. In 999 cases out of a thousand cases the fluid contents of a swollen joint is sterile (non-infected). On the other hand, no matter how careful the surgeon may be, the chances are that the aspirating needle is infected—at any rate, why run the risk of ruining a joint.

This reasoning does not apply to a bursitis. A bursae not connected with a joint can be tapped repeatedly with no after effects. If tight strapping with adhesive and a two-days' rest of the joint does not reduce a bursitis, aspiration is advisable. Follow with tight strapping to keep the bursae from filling up again.

If all conservative treatment fails in a case of bursitis an excision of the bursae may be indicated.

### CHARLEY-HORSE (Muscle-Bone Bruise)

Even among trainers and physicians who specialize in the treatment of athletic injuries, there appears to be considerable difference of opinion as to what constitutes a "charley-horse". As far back as 1917 I arbitrarily defined a "charley-horse" as a muscle-bone bruise. The interesting experiments carried on by Dr. T. H. Bast and George Berg of the University of Wisconsin, certainly prove that I was right, both in the definition and in the description of the pathology of a "charley". To the laity any injury of a limb which incapacitates an athlete is a "charley-horse". The sporting news columns frequently spill barrels of tears in telling about Babe Ruth's terribly annoying "charley" but the fact remains that this baseball hero has a "pulled" tendon. A trainer ought to have a clear conception of a "charley-horse" in order to be able to apply the appropriate treatment.

**Cause**—In a game occasions occur when a charging player, with muscles tense and arms and legs driving like powerful rams, sails into another player who is temporarily relaxed, whether due to the unexpectedness of the attack or to fatigue. The relaxed muscles of a limb (usually of either thigh) are forcefully jammed against the underlying bone and we have a severe bruise of the muscles, bone, blood vessels and often the nerves—in short all the tissues intervening between the skin and the bones are more or less squashed. There is internal bleeding from the torn blood vessels. The injured muscle tissue coagulates, hardens the involved area so that it may feel like a knob and causes limitation of motion. Thus the diagnosis depends on

the history of the injury and the hard painful congestion in a muscle.

**Treatment**—The main object is to increase the circulation in order to hasten the carrying off of the extravasated blood, soften the coagulated muscle and hurry the reparatory process.

As soon as the injury occurs apply heat in any form (diathermy, Infra-red, arc lamp, electric pad, hot fomentations) for from half an hour to one hour. Use an antiphlogistine dressing, a hot water bottle or an electric pad over-night. The following morning use heat applications and massage, kneading to break up any hard masses. This will be rather painful but should be persisted in. Protect with a vulcanized fibre bridged protector and send the man out to "run signals." Keep using the limb. Rest or immobilization may result in permanent deformity. No man should stay out of practice on account of a "charley" unless it is a very severe one. But—an effective protection is vitally important, since a second blow may do a great deal of harm and may even cause permanent disability. And when you apply the protection do not stinge on adhesive, make sure it stays "put".

If a "charley-horse" is improperly treated by immobilization there almost always follows fibrosis of the coagulated muscle forming a gristle-like mass. This may continue hardening to bony consistency, resulting in "myositis ossificans," which permanently impairs the function of the involved muscle.

### SHIN SPLINTS

Overwork of the extensor muscle of the lower leg causes "shin splints." Undoubtedly the wear and tear on the tendon of this muscle causes a teno-syno-

vitis (inflammation of the tendon sheet and effusion of fluid into it). The symptoms are: dull constant pain radiating down the spine of the shin bone and aggravated when the muscle is used.

**Treatment**—Complete rest for a day or two is essential. Heat applications. Massage with "hot-stuff" liniment or analgesic. Iodine Petrogen is recommended by some trainers but I do not believe it is of much use. Heat and rest are undoubtedly the logical remedies.

### CRAMP OF MUSCLE

The cause of the cramping of a muscle or muscles may be overwork, exposure to cold or a lack of fluid in the body. Athletes sweat considerably and lose from 2 to 4 pounds of fluid during each work-out. Unless this fluid is quickly replaced by drinking water freely, the blood in order to keep its own concentration up to normal draws fluid from the tissues. The idea that blood is "thick" or "thin" is plain bunk. By absorbing fluid from the tissues the blood keeps its normal concentration. However, the tissues giving up this fluid become "dry" and easily fatigued. Well, that is what happens to muscles. When the latter are "dry" they may cramp when a severe demand upon them is made. The remedy is self-evident.

To relieve a cramp, grasp the belly of the muscle and squeeze with considerable force. Rubbing and kneading manipulations may bring relief. Immersion in hot water is a reliable remedy.

### STIFFNESS OF MUSCLES

**Cause**—An excessive accumulation of products of fatigue in the blood, due to strenuous exercise and

inability of the circulation to remove this morbid material. This condition is rather common among athletes at the start of a training season. Do not allow the man to "lay off" on account of stiffness.

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

#### "STONE BRUISE"—"HEEL BRUISE"

**Cause:**—Hitting some hard object. The injury is very irritating, painful and bothersome. It generally occurs on the sole or heel of the foot, and occasionally on the palm of the hand. It may be a bruise of the muscle, of the bone, or both. It is a "charley".

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

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

### BONE BRUISE

Bone bruises are always more painful than those of soft tissues. This is due to the incidental periostitis (inflammation of the periosteum or covering of the bone). The effused material finds considerable difficulty to distend the closely adherent periosteum and there is consequent pressure against the neighboring nerves. The pain is more or less constant, sickening and intense. Bone bruises are very slow in healing and are easily aggravated. Therefore, be sure to protect such injuries—by bridging over the bruised part. The treatment is heat, antiphlogistine applications or "wet dressings".

The crests of the hip bones, the shins and the upper part of the ulna, are most susceptible to bruises, undoubtedly because they are the most exposed or superficial.

### WOUNDS

Wounds of all sorts are frequent in athletics. As a general rule they are superficial, infrequently infected and rarely serious. Still in dealing with any wound we must always bear in mind the possibility of a more or less serious infection. It is the latter factor that makes a wound, however small, a matter of concern. The trainer must bend all efforts to keep a wound aseptic. Naturally, he cannot prevent some germs from reaching the exposed tissues but the body is well able to cope with these few intruders. It is only an overwhelming attack of germs of high virulence that breaks down the defenses of the body and becomes a source of grave danger.

**Treatment of Wounds** — In general a superficial wound should be cleaned with alcohol and aseptized with Tr. of Iodine or Mercurochrome.

Foreign matter, such as dirt, cinders, etc., should be washed out with liquid soap solution or with boric acid solution. Imbedded particles may be extracted with tweezers. Follow by cleansing with rubbing alcohol and painting with Mercurochrome. Slight haemorrhage from the wound may be ignored, since the application of a sterile dressing and a snug bandage will stop all bleeding.

Wounds with considerable laceration of tissue should be washed thoroughly, the torn parts should be smoothed out with a pair of sterile tweezers, the wound bathed with alcohol or ether and thickly coated with Mercurochrome or Iodine. Gaping wounds should be "stitched." Use only sterile gauze as a dressing for wounds. To prevent the formation of hard "scabs" with poodles of pus underneath I use a thin layer of Unguentine or Balsam of Peru, or Ichtyol ointment on the sterile gauze dressing.

Football and basketball players are usually covered with numerous slight abrasions of the skin, due to the roughness of the two sports. Sponging the body with salt solution following the shower is an effective means of cleansing these abrasions. As an extra precaution it is advisable to dab all these abrasions with an antiseptic. A dab in time may save your eleven or your nine. Boxers too, show numerous "glove burns," which should be properly attended to.

**Small Face Wounds**—Wash with alcohol or ether and paint with flexible collodion.

**"Eye Cut"**—Incised wounds over the eye are met with quite frequently, especially among boxers. The skin, which is quite thin over the eye, rests on a rather sharp ridge of bone. A gliding blow slits the skin in two. Should this occur in the course of a game or a bout, paint the wound with Tr. Iodine, which serves

as an antiseptic and as an astringent which stops the bleeding. The cut edges should be approximated with a few strips of adhesive and collodion poured over the strapping. This is quite effective in the temporary care of a cut over the eye. After the game or bout remove this temporary dressing, wash the wound thoroughly with alcohol. If stitching is necessary, do so. If the cut is a comparatively small one, paint with Mercurochrome and approximate the cut edges with strips of adhesive which have been flamed over to sterilize.

**"Spike Wound"**—Allow to bleed for a few moments in order to cleanse the wound. Remove all dirt by washing with green soap, gasoline or alcohol. Fill the wound with Mercurochrome or Iodine. Apply an ointment. If the wound is a deep one and permits a drain, insert a strip of Iodoform gauze, which should be removed the following day.

**Torn off Skin**—Common among gymnasts working on the horizontal bar, the parallels, etc. Wash with gasoline, ether or alcohol. Paint with Tincture of Benzoin twice daily. Protect the tender skin with a strip of sterile gauze and adhesive.

**"Strawberries" ("Floor Burns")**—Here the upper layer of the skin is scratched off by sliding or scraping against a rough wall. Wash with alcohol, paint with Mercurochrome or Iodine, apply a dressing of Unguentine or Ichthyol ointment. Repeat this procedure daily until the wound is healed. In case the healing progresses rather slowly discontinue the ointment dressing and dust the wound with Aristol or Bismuth Formic Iodide.

**Split Lip**—Bleeds profusely. Saturate a pad of cotton in Adrenaline (1/1000 solution) and place next to the wound. This combined with pressure of the

lip against the lower gum will effectively stop the bleeding. "Stitching" may be indicated. Only experience will teach a man just when "stitching" is better than approximation with adhesive.

**Cinder Scratches**—Are generally due to a fall on a cinder track. Thoroughly wash the wound with soap and warm water or clean out the cinders. Wash with alcohol. Apply a dressing of cottonwool saturated in glycerine or an Ungentine dressing, to loosen the embedded cinders. The next day wash again with alcohol and paint with iodine.

### CONTUSED WOUNDS

Contusions are plentiful in athletics. There is a history of a blow, localized swelling, "black and blue" discoloration, numbness, stiffness, more or less pain and tenderness. Make sure there is nothing more serious than a bruise. Apply heat in any form you prefer—your aim is to increase the local circulation in order to carry away the effused blood and reconstruct the destroyed tissue. An antiphlogistine application or an electric pad hastens the healing process. Many physicians prefer the use of "wet dressings" but these are inferior to heat in the treatment of bruises. After 24 hours massage to break up the coagulated blood and continue heat applications until the part regains its normal condition.

In some cases of contused wounds there may be considerable subcutaneous bleeding, because a rather large blood vessel is ruptured. The pool of blood thus formed is called a HAEMATOMA. Since it doesn't fit in with the bodily mechanism, the body treats it as a foreign substance by walling it off with a capsule. The blood coagulates and if palpable from the outside feels like a solid tumor. In time the body breaks up

this coagulum and absorbs it into the lymph channels. Infrequently these haematomas become infected and form abscesses. A short time ago I had an overgrown wrestler come to me with an extensive bruise of the right upper arm, which was inflamed, throbbing and very painful. The man had chills, fever and a headache. The axillary glands were swollen and very tender. There was a fluctuating area over the biceps and on lancing it I obtained over a pint of thick pus and blood.

### HAEMORRHAGE

Slight bleeding can be controlled by painting with Tr. of Iodine and the application of a snug dressing. Severe haemorrhage calls for specific measures. If the haemorrhage is arterial—the blood bright red in color and escaping in spurts—apply a tourniquet above the site of the wound and either send for a physician or call an ambulance and rush the man to a hospital. A tourniquet should be loosened every ten or fifteen minutes to prevent death of tissue (gangrene). You may try to tie a thick pad of sterile gauze over the wound. If this fails to stop the bleeding the cut ends of the artery will have to be caught with haemostats (special forceps for clamping a blood vessel) and ligated (tied with a ligature). This, of course, is in the domain of your medical adviser.

If the bleeding is venous—the blood being dark red in color and flowing in a steady stream—apply pressure below the wound. Moderate bleeding of a wound is beneficial in that it serves to cleanse the nooks of the wound more thoroughly than you can.

### BLACK EYE—ECCHYMOSIS

A flying fist finds a nesting place in your eye, a few small blood vessels rupture and pour their con-

tents into the surrounding spaces. The bleeding soon stops but the effused blood begins to decompose, changing from a bright red to the gaudy black and blue tints of an old fashioned "shiner."

**Treatment**—If you are about just as the incident occurs, apply a chunk of ice or a dressing wrung out of ice cold water to the eye, using considerable pressure—your first aim is to stop further bleeding and cold and pressure are excellent for the purpose. Ten to fifteen minutes after the injury the bleeding has stopped of itself. Now your aim is to try to get rid of the effused blood before it begins to decompose. Apply heat, in the form of hot fomentations or an Infra-red baking. Six hours after the injury you can start circular massage and vibratory treatment in alternation with the heat applications.

Dr. Allen recommends the application of a dressing saturated in English marigold (*calendula*). The heat and massage treatment will bring quicker results but if you haven't time to bother with a mere black eye try Dr. Allen's suggestion.

It is well to keep in mind that a blow on the eye may be far more serious than the mere unwelcome discoloration. Not infrequently the retina is partly detached by a blow. If the patient complains of difficulty with his eyesight, which cannot be accounted for by the extent of external involvement be sure to consult a physician specializing in disorders of the eye.

### EPISTAXIS OR NOSEBLEED

Nose bleed may be caused by a blow or violent sneezing, which ruptures some of the small blood vessels on the septum. **Treatment**—compress the nostrils for a minute or two; if ineffective place a cotton plug saturated in Adrenaline solution into the nostril. If you have no Adrenaline the cotton plug alone will do.

### INTERNAL HAEMORRHAGE

Here is a dangerous condition, which if not quickly recognized may result in a fatality. Fortunately, internal haemorrhages of an extensive nature are almost unknown in athletics. It is generally due to extreme violence resulting in a rupture of a good sized artery or vein. The diagnosis depends on the following symptoms: progressively increasing pallor and blueness (cyanosis) of the skin; clammy skin; air hunger or gasping for breath; considerable shock; rapid weak pulse; subnormal temperature; falling blood pressure; the abdomen may become tense and tender (if it is the abdomen that is involved). Elevate the lower part of the body and lower the trunk to assure a supply of blood to the brain. Place ice or cold applications to the apparent site of the injury. Rush patient to a hospital. Be prepared for an operation and a blood transfusion.

### ULCERS

Ulcers are poorly healing wounds. When a wound does not respond to the usual measures it is well to do a little quizzing to find out whether the patient has some sort of a chronic disease, which is lowering his vitality. Turpentine is claimed to be an effective stimulant for these poorly healing wounds. Try it. I have always believed in plenty of sunshine for these ulcers and have been instructing my patients to uncover the wound and let the sun burn down on it. The Ultra-Violet Rays ("canned sunshine") are excellent for the purpose. Avoid over-treatment and also avoid continuous use of ointments which keep the ulcer soft and macerated.

### FINGER CRACKS

Chapping of the hands may be followed by very annoying cracks of the skin. Glycerine applications

are most effective here. The wearing of a rubber cap on the affected finger will aid in softening the dried out skin.

### CAULIFLOWER EAR

In the course of a bruise of the ear, a blood vessel may rupture and pour its contents in the space between the two layers of skin of the auricle (the external part of the ear). If left untreated the blood coagulates and may become "organized," that is changed into connective tissue. The latter hardens into "gristle" (cartilage) and even bone so that an old cauliflower may feel quite hard. Proper treatment at the time of the injury can prevent all this. As soon as the injury occurs use ice or ice water applications with pressure in order to stop further bleeding. About an hour after that, begin applying hot fomentations or the Infra-red lamp. Next massage the ear using firm, steady stroking movements, aiming to press the effused contents out of the auricle towards the scalp. If the heat applications and the massage fail to reduce the swelling, consult a surgeon, who will probably make a small incision in order to allow the effused contents to escape or be expressed by scraping. Wrestlers and boxers, who are most susceptible to this injury, will do well to wear some sort of a protection for the ears—at least during practice. A simple protective bandage is made as follows—place some cottonwool back of each ear, apply a circular bandage around the head and ears with roller gauze or muslin bandages and fix the whole with one turn of adhesive tape.

### VARICOSE VEINS

Varicose veins are caused by the failure of the valves of the veins to support the column of blood. The walls of the veins become dilated and consequent-

ly weakened. At times the distention is extreme enough to rupture the vein and cause a haemorrhage.

**Treatment**—In young people massage and cold baths should re-invigorate the involved veins. The ACE or similar bandages are used for elastic supports of the weakened columns.

### INGROWN NAIL

Toe nails should be trimmed by cutting straight across, or if anything, hollowing the middle slightly so that the edges protrude.

**Treatment of a mild case:**—Soak the toe in hot water for half an hour. With a pair of forceps lift the buried edge of the nail and force a small wad of cottonwool saturated with Tr. Iodine under the nail. Repeat this treatment, changing the cotton every few days until the troublesome edge grows long enough. At times it is possible to apply a narrow strip of adhesive so as to pull the soft tissues away from the buried edge of the nail.

**Treatment of an advanced case:**—This is usually characterized by inflammation and excruciating pain in the affected toe due to the fact that the nail is buried pretty deeply in the soft tissues. The conservative treatment outlined above may fail. It is then advisable to excise half of the nail. The question arises as to what kind of an anaesthetic to use. Injecting all around the base of the toe with Novocaine (2%) is the common method used by surgeons. Trainers probably will be unable to obtain the Novocaine, which is a narcotic, and again, may not be trained in the technique of injecting the anaesthetic. Unquestionably no man should fool with injections who has not had instruction in proper technique.

Ethyl chloride is favored by trainers, but I question its effectiveness on a nail. To get around this, some trainers repeatedly paint the ingrown nail with Silver Nitrate solution (20%). The latter destroys tissue and, if applied long enough, will "eat up" the nail. When the disintegration of the nail reaches a point where the underlying matrix (bed) of the nail is exposed, ethyl chloride becomes a useful local anaesthetic and the ingrown part of the nail can be clipped off with a sharp pointed pair of small scissors. It may be necessary to pull the nail off with a pair of forceps. All instruments used in this operation should be sterilized by boiling in water for 20 minutes. The toe should be painted with Iodine before the scissors are used. After the removal of the nail, treat the resultant wound as an infected one. Asepticize carefully with Iodine or Mercurochrome and apply a dressing of Unguentine to reduce the irritation and inflammation. Dress daily until healed.

If your experience is limited it is best that you refer operative cases to your medical adviser.

### SOFT CORNS

Friction, uncleanliness, excessive perspiration or failure to dry thoroughly after a shower frequently cause maceration of the skin between the toes and this condition is known as "soft-corns".

**Treatment:**—The first aim is to remove the cause. Keep the parts thoroughly dry. Paint the whitish skin with Silver Nitrate to disintegrate the tissue. The corn will dry, become hard, scaly and blackened. Remove as much of the blackened cuticle as is possible with a dull knife. Keep the toes apart with a small wad of cotton to prevent further friction.

### CORN (HARD)

Pressure is the only cause of hard corns.

**Treatment:**—Remove the cause. For about four or five successive days paint the corn with Salicylic acid 20% in collodion and apply a corn plaster to protect from further pressure. The Salicylic acid macerates and softens the corn. On the sixth day soak the foot in hot water for about 20 minutes, paint the surrounding skin with Iodine and scrape off the corn with a sharp sterilized scalpel. If the corn is very bothersome and you do not care to delay its removal, soak the foot in hot water, paint with Iodine and remove the corn with a scalpel. Cover with a sterile dressing to avoid infections.

### CALLUSES

Pressure is the only cause of calluses.

**Treatment:**—Soak the foot in hot water for 30 minutes, or still better, in hot washing soda solution. Dry. Paint with Tr. Iodine to asepticize. Shave the thickened cuticle with a sharp scalpel, if you are handy and careful with surgical instruments, and remember to sterilize them. If a beginner, better scrape with a dull knife. Wash with alcohol. Paint with Iodine. Protect the part from further pressure with a bunion plaster. The application of collodion and Salicylic acid (20%) for four or five successive nights, helps to disintegrate the callus which can then be easily peeled off.

### BUNIONS

Due to ill-fitting shoes the bursae lying between the base of the big toe and the head of the metatarsal which articulates with it, becomes inflamed, swollen and painful.

**Treatment:**—First remove the cause. Get a sensible pair of shoes that give the toes a chance to spread out. Place a felt pad between the big toe and its neighbor so that the former is compelled to straighten out. If the joint is inflamed and painful apply wet dressings or Ichthyol ointment until the redness subsides. At times the bursae may become infected and then an incision becomes necessary. Advanced cases of "bunions" will respond to conservative treatment very poorly and an operation may be indicated. The operation is a rather simple one, but disables a patient for at least six weeks.

### 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.

### WEAK OR FLAT FEET

Weakening or actual breaking down of the arches of the feet is not infrequent in athletics. Injuries of the foot, especially severe sprains, predispose to this condition. When the arches are down "flat", diagnosis is comparatively easy. But this type of "flat-foot" is rarely bothersome unless it is in the acute stage. As a rule the athlete will give a history of chronic flat-foot with practically no symptoms.

The troublesome cases are the "weak" feet. Here the arches have not come down but the ligaments are not standing the strain well and are beginning to "give". The strain on the ligaments, the changes in the normal relations of the bones, serve to create

symptoms of pain, tenderness, burning of toes, pressure on the heel or over the heads of the metatarsals (at the base of the toes), pulling of the Tendon of Achilles, cramping of the "calf" muscles and even pain in the hips. On examination we may find very little. Thus the arches appear normal. We notice tenderness at the heads of the metatarsals and at the base of the os calcis. The heel may be painful. The Tendon of Achilles may feel rather taut.

This type may be considered as an acute "weak" foot and treated as follows:—Strap with adhesive to relieve the ligaments of some of the strain on them. Use the Gibney method but favor the inside of the joint (when starting the strapping have the foot in an inverted position). Bear in mind that you are trying to pull up the central (long plantar) arch and throw the weight to the outer side of the foot. A pad of felt, about  $\frac{3}{8}$  of an inch in thickness cut in a semi-circle so as to fit the long arch is often of great relief in these cases by further relieving the strain on the ligaments. Mechanical supports (steel braces) are out of favor with orthopedic surgeons in the treatment of acute "flat-foot". We rely mainly on strapping and some support similar to the felt one described above and a progressive reconstructive program. Thus, as soon as the acute symptoms subside, the patient is instructed to bathe his feet in hot and cold water in alternation for about an hour. Then the feet are given a thorough massage and resistive exercises. Finally the patient is instructed to practice at every opportunity the following corrective exercises:—

Stand with feet apart, toes turned in. Rise on toes a number of times. From the same position raise the arches of the feet while keeping the toes and the heels down on the ground. Repeat a number of times.

Walk on the outer borders of the feet. Walk on the heels. Walk on tip toes. Vigorously separate the toes.

At first do these movements only a few at a time. Gradually increase the duration. In walking, try hard to point your toes straight ahead and not East and West a la Chaplin. During the war I used these exercises in restoring normality to the arches of hundreds of enlisted men.

### METATARSAL PAIN

The transverse ligaments which bind the heads of the metatarsal bones may be strained as a result of a wrench, the wearing of poorly fitting shoes, or as a step in the breaking down of the arch of the foot. The patient will complain of pain, especially on walking, at the base of the middle toes and at times large painful calluses may form over the site of the trouble. On palpating the area you will find considerable tenderness and a prominence of the heads of the middle metatarsals.

**Treatment:**—Assure a sensible wide shoe which will not cramp the toes. Soaking the foot in hot water will relieve the pain. Cut a felt pad,  $\frac{3}{8}$  of an inch in thickness, made to fit over the site of the trouble. This pad will support the transverse arch and will tend to relieve the pain. If you find this pad aggravates the pain change its position or shape until you take the weight and pressure off the painful area.

### BOILS—FURUNCLES

**Cause:**—As a rule infection by staphylococci, which take root because the local resistance is lowered by persistent friction or an injury or because the general resistance of the body is below par due to lack of vitality (run-down condition). The appearance of a

boil is familiar to all. It should be differentiated from a carbuncle, which covers a larger area, is flat, and as a rule has a number of "heads." The treatment of carbuncles should be referred to a physician.

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

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

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

**Treatment of a "ripe" boil**—Wash the surrounding skin with grain alcohol and paint with iodine. This will prevent infection from the escaping cocci when the boil is lanced. Use Ethyl Chloride as a local anaesthetic. It comes in specially constructed glass tubes with attached sprayers. Drive a stream of Ethyl Chloride on the area of the boil until it becomes snowy white in color. Holding the scalpel with the cutting edge upward, stick the sharp edge about three-eighths of an inch deep into the skin and cut upward. The opening may be widened by inserting a haemostat and then spreading the blades in various directions. Some surgeons use two incisions, which cross each other at right angles. When the resultant flaps are drawn back there is a wide opening permitting free drainage. As the pus contents escape catch them in cotton wads and be careful what you do with these infected wads. Don't squeeze the boil. Rough squeezing will break the protective capsule and permit the spread of the

infection. Gently but firmly press down on the sides of the boil stretching the skin away from the incision. This flattens the cavity and expresses the contents. If the "core" remains, grasp it with a pair of sterile tweezers and gently try to draw it out. If you can't do that without jerking—leave it alone, it will come away of itself on the morrow. Next swab the cavity with a piece of cottonwool (on a toothpick or wood applicator) saturated with Tr. of Iodine or Mercurochrome. Again wash the surrounding skin with alcohol and paint with iodine. Place a drain of Iodoform gauze into the cavity of the boil and apply ample dressings. Some prefer not to use drains but simply apply a dressing of Ichthyol ointment, which serves to "draw" out the remaining contents of the boil. A boil cavity should not be permitted to close too quickly—it may heal on the outside whilst there still remains plenty of infectious matter in the cavity. That is why a drain or an Ichthyol dressing is essential—either prevents the closing up of the wound until the cavity fills up with normal tissue. And also that is why I warn against the use of Iodine powders in the treatment of boils.

Dress the wound daily by painting with Iodine and applying clean dressings until the wound is healed. And, finally, protect yourself and your boys by being extremely careful in the treatment of boils.

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

There are a lot of foolish suggestions as to how to abort or kill boils but none of them are of any worth. There is no way of killing a boil. Even if there was, such a procedure would be contra-indicated, since cer-

tainly no good could result, if the infection were driven from its localized point, all over the body.

### ACUTE ABSCESS

An abscess is an encapsulated circumscribed collection of pus. It is caused by septic germs, such as the staphylococcus or the streptococcus. The abscess tends to extend in the direction of least resistance. If it is superficial, it finds the skin comparatively easy to penetrate and burrows through it until it can be seen on the surface as a flaming red area, which feels hot, fluctuating and is very tender. If left untreated the pus continues the thinning of the skin finally rupturing through and pouring its contents into the great wide World. The surgeon tries to anticipate this spontaneous rupture by making an incision similar to the one recommended for boils. In general, the treatment of an acute abscess is exactly the same as that of a boil but it must be referred to the medical adviser. These abscesses may occur in any part of the body. One of the most disabling is an ischio-rectal abscess, which involves the ischio-rectal fossae flanking each side of the anal opening.

### CELLULITIS

Cellulitis is an inflammation of the subcutaneous tissues. There is usually a history of some sort of an infection or trauma. The lymph channels are clogged by the products of the infection or the trauma and the lymph pours out into the surrounding tissues. What the trainer sees is a more or less extensive brawny swelling of the tissues and a redness of the skin, which is quite warm to the touch. Whenever you see a rather flat swelling which is bright red in color and only moderately painful—call it a cellulitis. The exuded

lymph may become infected (by extension from the wound, which was the cause of the cellulitis) and we then observe signs of softening ("fluctuation"), there is more pain, which may be throbbing in character and the patient may have chills and fever.

**Treatment of an Uninfected Cellulitis**—Apply wet dressings, preferably warm. Epsom salts solution or the A. W. G. mixture (see under Supplies) will do excellently. These aid in softening the effusion and stimulate its re-absorption.

**Treatment of an Infected Cellulitis**—Must be referred to the medical adviser, who will probably wait for "fluctuation" and then incise and drain.

### LYMPHANGITIS AND LYMPHADENITIS

One of your boys has an infected finger, which is being treated. One bright morning he calls your attention to pretty red streaks, which can be seen running up the arm. In the axillae you feel one or more semi-hard masses, which are quite tender to the touch. The "red streaks" are inflammations of the lymph vessels and the masses in the axilla are inflamed lymph nodes. The lymph vessels draining the infected finger have become infected themselves—that is called lymphangitis. The infection has also hit the lymph glands—and we have lymphadenitis.

**Treatment**—To begin with an infection causing lymphadenitis and lymphangitis, should be referred to your medical adviser. He will proceed to remove the cause—namely the original infection in the finger. An incision may be indicated in order to allow the infected matter to drain out rather than into the lymph channels. He will probably apply wet dressings to cover the whole length of the inflamed lymph vessels. The

swollen gland in the axillae may at times suppurate (form an abscess) and have to be incised. In all infections it is important to pay attention to the general hygiene—the bowels must be kept open, the patient should eat wholesome, easily digestible food, preferably liquid; he should get plenty of sleep and rest the affected limb.

### SWOLLEN GLANDS

Lymphatic glands or nodes serve as sieves for the waste matter of the human body. Not infrequently they are overwhelmed by an excess of waste, toxins or germs and become inflamed, tender, painful and swollen. When one of your boys has tonsillitis you will find swollen glands under the jaw. An infection on the arm may cause swollen nodes in the corresponding axillae. If you find enlarged glands at the junction of the thigh and the abdomen, look for a suppurating wound along the leg. Removing the cause usually results in restoring the glands to normal. Applying hot fomentations may relieve the congestion in the gland or if the latter is infected the heat may serve to "draw" out the infection, acting as a poultice. If the gland suppurates an incision is indicated.

### IRRITATION OF SKIN DUE TO TAPING

Men vary in their susceptibility to ZO adhesive tape. However, if adhesive is left on for a prolonged period there is a chemical reaction between the perspiration and the adhesive, producing an irritation which may be followed by a rash.

**Treatment**—Remove the tape. Wash with Benzine or with Ether. Dab with alcohol and rub in Unguentine. Cover with sterile gauze. Repeat the procedure daily until the skin is back to normal.

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

### 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.

### FOREIGN BODY IN EYE

Instruct the patient to lie 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.

### HARDENING THE SKIN

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

The following astringents are all effective in hardening tender skin:

Tannic acid—tablespoonful to a quart of water.

Glycerite of Tannin.

Alum—a teaspoonful to a pint of water.

Formaldehyde—1% solution.

### KNOCKOUT BLOW

Any blow that prevents a man from continuing a boxing match is a "knockout" from the legal viewpoint. To the trainer a "knockout" blow is one that rocks the Terrible Mauler into sound sleep or unconsciousness. A well conditioned boxer is more or less hardened to punishment. Still we have a number of spots in our body which are peculiarly susceptible to blows. A "knockout" blow depends more on landing "just right" rather than on the power behind the punch. Firpo and Dempsey, in their famous battle, knocked each other down with almost every blow that landed but it took just one blow, connecting with the famous "button" to stretch out the Bull of the Pampas. Yes, it is the landing "just right" that brings the shower of stars, the warbling birdies and the glorious feeling of "niemand zu hause". Because of peculiarities in physiques and especially in the bony structures

of our body, the individual susceptibility of boxers to punishment varies greatly. Some have "glass" jaws while others have "cast iron" ones.

The effects of a knockout are almost always transient. The fatalities which occur occasionally can be traced to such contributing causes as striking the head in landing and fracturing the skull, etc. Again, a severe blow just under the heart of a man who unknowingly has had heart disease may end fatally.

I have discussed above the "solar plexus" knockout. The one to the chin ("Button") is far more common in occurrence. In the book on Boxing (Scribner's) which I have written jointly with Phila. Jack O'Brien, I discussed at length the various knockout blows, their pathology and treatment.

**Treatment**—When a knockout occurs, it would be best (therapeutically) to leave the man stretched out on the canvas while the restorative treatment is applied. The unconsciousness is due chiefly to the anemia (lack of blood) of the brain. If, as is usually done, the boxer is stood up or dragged to a chair the anemia is bound to increase and the unconsciousness to persist. On the other hand if you allow the man to lie stretched out for a few minutes while you pass the smelling salts near his nose, wipe his face with cold water and pump his arms to aid the respiration, the chances are that he will recover quickly. If in falling he banged his skull, watch him carefully for signs of a concussion or even of a fracture of the skull.

### "WIND KNOCKED OUT" "SOLAR PLEXUS BLOW"

The powerful muscles of the abdominal wall serve as excellent protectors of the underlying viscera. When a man sees a blow coming his rectus abdominis tense

and no harm is done. Every now and then however, a ramming fist, knee or head will catch the muscles unprepared and jam them against the underlying viscera. Just below the level of the ribs and back of the stomach, hanging on to the spinal column like a bunch of wild weeds, there lies the "solar plexus," a network of nerves, which include branches of the sympathetic system and those of the vagus. The latter is one of the most important nerves in the body, having more or less to do with the function of the heart, the lungs, the stomach, the intestines. A powerful blow, getting by the abdominal muscles, carries through the soft tissues contusing the nerves comprising the plexus. Almost instantaneously the recipient of the blow feels faint, dizzy, weak, unable to breathe. He is conscious but cannot utter a word. The abdomen is agonizingly painful. All the strength seems to have oozed out of the body and the athlete collapses on the ground, with knees drawn up, pawing at his "tummy", moaning. This is the famous "solar plexus" knockout. The effect varies with the extent and severity of the trauma to the plexus.

A momentary interference with the respiration may occur as a result of a sudden severe blow to the left short ribs or just under the heart. A blow to either place will knock the "wind" out of a man but only for a short period of time.

It is well to bear in mind that blows delivered to the "solar plexus" region ("the mark"), the short ribs or under the heart, may not lay a man out, but slowly sap his strength.

**Treatment** — When the injury occurs during scrimmage or a contest, allow the patient to rest on his back, aid respiration by flexing and extending the arms and the legs. Raising the arms forward over-

head and bringing them back to position is another effective method of pumping air into the partially paralyzed lungs. Don't allow any crowding about the patient, give him air and plenty of it. Wiping the face and the back of the neck with cold water will help to restore the athlete. If recovery is slow be on the alert for an internal injury. If the patient does not recover promptly and shows increasing weakness, pallor or complains of pain, send for your medical adviser. Meanwhile keep the patient warm with plenty of blankets. An ice bag to the site of the injury will help. Rubbing the part is undoubtedly efficacious in bringing relief but when you do it, you are sort of shutting your eyes on the possibility of it being a more serious injury, which may be harmed by the rubbing. Seconds in the boxing ring use smelling salts to help bring their men around.

### CONTUSION OF SCROTUM

#### (Foul Blow)

Because of an extensive network of fine nerves the scrotum (especially the testes) is very susceptible to trauma. A blow produces a sickening, sinking sensation, which may range into agonizing pain.

**Treatment**—Rest on back, knees drawn up. Raising the lower limbs by grasping the thighs and lifting the lower body upward tends to lessen the congestion of blood in the scrotum (which always follows a blow) relieving the athlete. If the pain is severe, support the genitals on a towel bridged across the thighs and apply an ice bag or towels wrung out of cold water. If symptoms persist, or the scrotal bag continues swelling, consult a physician. Aluminum jocks are useful in protecting the scrotal bag.

### 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. 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 choking. Temporary unconsciousness may occur. Wipe his face with a cold towel and give him salts to smell. Headache may last for a few days. It would be advisable for the man to refrain from study for a day or two following such an injury. As a rule always send for a physician when such injuries occur. If there is bleeding from the nose or ears, suspect a fracture of the skull—rush the patient to a hospital.

### SHOCK

Shock is a condition of more or less severe collapse due to mental and physical exhaustion brought on by a severe injury. Gameness and "bluff," which are characteristic of a vigorous athlete, to a large degree, prevent shock. Very rarely severe internal injuries involving some one of the vital organs may result in the collapse of an athlete. The symptoms of shock vary with the intensity: there is more or less pallor; the skin is clammy; the respiration is shallow, the pulse rapid and weak; the patient displays but little interest

in the men fussing about him; and he may be partially unconscious.

**Treatment**—Quiet, rest, comfort, warmth. Cover him well and place hot water bottles at the feet and at sides of the patient, taking care not to burn him. Hot coffee or hot tea should be given as a stimulant. No alcohol. Send for a physician.

### 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.

### 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.

### 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. A few drops of Oil of Peppermint or half a teaspoonful of Aromatic Spirits of Ammonia in wineglassful of water will "steady" the stomach.

### 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.

"Stitch in the Side", due to gases, must be differentiated from a rather painful affliction of the short ribs, especially of the left side, which completely disables an athlete. Dr. Allen claims that this injury is due to a luxated rib at its junction with the cartilage near the breast bone (sternum). The luxation causes pressure on the nerves and apparently produces a mild form of intercostal (between ribs) neuralgia. The treatment consists in osteopathic manipulations tending to straighten the luxated rib. The movements are largely those of stretching the corresponding arm and ribs upward, outward and slightly backward. If you want to tackle this yourself try a variety of stretching movements, remembering that osteopathic adjustments are not jerks but steady, stretching movements. If you fail, call an osteopath.

### TEETH

We are living in an age where bad teeth are thought to be the cause of most human ailments. This

is probably stretching a fact but let us have good teeth anyhow.

A toothache can be temporarily relieved with a good counter irritant. Oil of Cloves is popular. Tr. of Iodine will do in a pinch. Whiskey (on the tooth and gum) helps some. A tablet of Acetanilid (5 gr.) may be placed next to the aching tooth and allowed to dissolve (Allen).

### "GYM-ITCH"

Two types must be differentiated:—

1. **A Dermatitis** (skin inflammation) due to friction of closely opposed skin surfaces (arm-pit, thigh and scrotum, etc.), failure to dry the parts thoroughly, or excessive sweating. This type of "gym-itch" looks like a diffused red rash streaming out into the surrounding tissue without regard to form.

2. **Tinea Cruris**—is a species of ringworm which burrows into the skin forming a series of reddish, scaly, spreading patches which tend to fade centrally and spread peripherally. This form of "gym-itch" is infectious and contagious. An attack, unless treated with vigor has a tendency to persist for weeks or even months. When a case occurs, protect the squad by keeping the victim's equipment separated. Encourage frequent and thorough laundering of jocks.

**Treatment of the First Type** (Simple Dermatitis)  
—Dry the skin thoroughly. Rub in some Unguentine. Place a wad of cotton between the opposing skin surfaces in order to prevent further friction. Zinc stearate is an excellent remedy for a simple dermatitis.

**Treatment of Tinea Cruris**:—Wash with alcohol. Massage in Ammoniated Mercury ointment or an ointment containing Salicylic acid 5% and Benzoic acid

15%. The latter formula was recommended to me by Archie Hahn of Princeton and I find that it is corking good. Placed on the skin it "burns" severely for about 15 minutes. You feel like doing something to get rid of it. However, you manage to stick it out and are rewarded by the results which follow the first or second application.

Some trainers use 20% Salicylic acid in Collodion (same formula as for corns and calluses). This, too, is effective, since it disintegrates a thick layer of skin which includes the fungus growth. However, it is quite an heroic measure and I prefer the ointment.

In a pinch, washing with alcohol and painting thickly with Tr. Iodine is quite an effective remedy.

Ointments applied to the skin should be washed off daily with liquid soap and alcohol and re-applied. The base of an ointment is a fat which is apt to become rancid if left on for any length of time and, since rancid fats are irritating to the skin, one is inviting trouble in not changing ointment dressings.

### STALENESS

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

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

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

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

### 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.

### UNDER AND OVER-WEIGHT

As a rule the general training routine tends to normalize weight—reducing the fat, building up the lean, hardening those who carry their proper weight. Radical measures of weight reducing must be carried out with care. Growing boys should not be forced to undergo any severe regime tending to reduce weight. The matter of weight reduction is probably of greatest importance in boxing. In the Art of Boxing (Scribners) I have the following to say on the subject:

"The problem of making weight is a bugaboo to many a boxer who has made his mark in a given class. A fast-growing youth has great difficulty in keeping his weight within hailing distance of the class in which he has managed to attain some distinction and earning ability. He may be a prominent contender amongst

the lightweights, but as soon as he becomes a welter he is forced to start from the bottom of the ladder. Not infrequently his weight is just too much for the lower class and yet he cannot approach the poundage of the class above without showing a loss of speed. Of course it is healthier for a growing youth to build up rather than try, by means of various unnatural measures, to keep the weight down. It is possible, by means of intensive effort, to reduce considerably, but if one is reducing more than three or four pounds below his apparent best or "natural" weight he is certainly not doing himself any good and may be courting a lot of trouble. It is a safe bet that he will not enter the ring in anything approaching his usual form. True, a lot depends on the condition the man is in before he starts reducing. Of course, if he has fattened up he can lose many pounds and yet be the gainer. On the other hand, if he is down "fine" every pound he takes off is not only a pound of flesh but also a pound of blood. How is a man going to determine whether it is advisable for him to reduce or give it up and start building up for the class above? In this matter I do not believe the wisest and most experienced of trainers should act without consulting a physician . . ."

The methods available for reduction of weight are:—

1. **"DRYING OUT"**—This, undoubtedly, is most effective. An athlete loses from 3 to 8 pounds during a workout, depending on his weight and the intensity of his efforts. This weight is 90% water. He is very thirsty after exercise because the body wants this lost fluid back. Under normal conditions he drinks until satiated. On the morrow the scales will show that he is back to his usual weight. Suppose, however, that although craving water, he does not drink to satiation

but only to slightly allay the thirst—it stands to reason that he will begin to lose weight. And the more he has to reduce the less water must he take in and the greater will be his thirst. Many an old trainer will tell you tales of prize-fighters driven almost crazy by the overwhelming thirst incidental to "drying out".

2. **Increased Amount of Exercise**—The more rapid and the greater the amount of the exercises taken the greater the loss of weight per workout. Rapid exercises break down tissues whilst slow exercises build. Don't try to reduce too rapidly through increasing the amount of exercise—the body can stand just so much and no more. There is many an athlete leaving his strength, speed and stamina in the gymnasium or on the practice field. Again, intensive, prolonged exercise will give you hard, tied-up muscles and these are a debit in athletics.

3. **Massage**—A good masseur can tear down a lot of fatty tissue. The advantage of this method of reduction is that the athlete's energy is conserved. But massage alone will not reduce much weight and is a rather slow process.

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

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

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

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

### METHODS OF GAINING WEIGHT

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

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

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

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

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

### CHILLS

**Cause**—Exposure to cold or wet.

**Treatment**:—Give a steam bath or a hot shower. Put to bed, cover with blankets. Use a warm enema to clean out the bowels. Give hot lemonade to drink. When an athlete complains of a chill, attend to it at once, since it may turn into a cold, tonsillitis, etc.

### 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 "hot stuff" and otherwise protected from the cold.

### 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.

## CHAPTER XII

## COMMON AILMENTS

**Acute Appendicitis**—An acute inflammation of the appendix which may be roughly located in the lower right side of the abdomen. The appendix may be merely inflamed, pussy, or may have ruptured, pouring its pus contents into the abdomen, infecting the peritoneum (the membrane lining the abdominal wall and covering the viscera).

**Symptoms**—A typical case will give a history of chronic constipation, with perhaps a number of similar previous attacks. The patient is suddenly seized with colicky pains in the abdomen which soon localize in the lower right side. He is nauseous, may vomit, feels feverish and is "sick all over".

On examination you note the pinched, anxious expression. With patient lying on his back you gently palpate the abdomen to find it rather tense, especially so over the region of the appendix. Pressure here elicits pronounced tenderness. If while pressing you suddenly let go, the patient winces with the rebound of the abdominal wall. The patient's temperature (best taken by rectum) ranges about 101°.

**Treatment**:—Immediately send for a physician. Absolute rest. Nothing by mouth. No medications to suppress the pain and under no circumstances should a laxative be given if appendicitis is suspected. Place an ice bag over the region of the appendix.

## ACNE VULGARIS ("PIMPLES")

Crops of "pimples" may break out on the face, on the back, on the chest, etc. The exact cause is not known. Since the condition is rather common in adolescence, it is assumed that some defect in the function of glands of internal secretion lowers the resistance of the skin so that the ducts of the sebaceous glands of the skin become clogged with pyramids of blackened pus and fat. These "blackheads" are quite annoying and many an athlete will appeal to you for relief.

**Treatment**:—First, the general hygiene must be attended to. Check up on the digestion and bowels and correct abnormalities. Locally, the main object of the treatment is to increase the circulation of the skin, open the clogged ducts and cause the extrusion of the "blackheads". Heat, in any of its forms, is our main reliance. Instruct the patient to give his face a thorough steaming with hot towels for about 15 minutes daily. Finish with a short cold application. Wipe vigorously with a coarse Turkish towel. Following the steaming the "ripe blackheads" should be pressed out with a comedo extractor (which can be purchased in any drug store). Rubbing alcohol (70%) applied after drying the face serves as an excellent antiseptic and invigorator of the skin.

If you have an Arc lamp, or an Infra-red lamp, give the patient a daily exposure of about 15 minutes followed by extraction of the more prominent "blackheads".

Unquestionably the most effective treatment for acne is that with the Ultra-violet rays. These rarely fail, but I have not stressed this treatment because so few trainers have an Ultra-Violet ray generator.

**CHAPPED LIPS**

Apply cold cream, vaseline or camphor ice. Warn not to lick the lips.

**ARTHRITIS**

Is an inflammation of all the tissues about a joint (ligaments, cartilage, synovia, bones). The synovial lining of the joint is involved and then extension of the infection to the bones follows.

The cause is assumed to be toxins of various diseases. The teeth, the tonsils, the ears, the gall bladder, the prostate, and especially the bowels are branded as nests or foci where harmful germs thrive and pour their toxins into the blood stream. The latter carries the toxins to every nook and corner of our body and especially to our joints which are quite susceptible. Assuming that for some reason the local resistance is lowered, the toxins serve as irritants. Irritation brings inflammation and the latter results in disability, deformity and perhaps destruction.

Arthritis may be acute or chronic. In athletics we rarely come across the chronic type, for the simple reason that an individual suffering with a chronic joint disease is not very apt to go in for strenuous physical training. The acute type may follow an injury, an infection near the joint, acute articular rheumatism, gonorrhoea, etc.

**Symptoms:**—The joint is swollen and distended with fluid. The limb is held rigid in a semi-flexed position by the spasm of the surrounding muscles. The swelling is hot, tender to touch and quite painful when the joint is at rest (because of the extreme distension of the joint by the fluid).

**Treatment:**—Consult an orthopedic surgeon. Rest, careful diet, bowel hygiene, electric cabinet baths and diathermy locally—sums up the modern course of treatment.

**“COLDS”**

A colloquial term for anything from two successive sneezes to a severe bronchitis verging on pneumonia. A cold as a rule starts with a

**Catarrhal Inflammation of the Nose**—There is congestion (stuffing) of the nasal passages, sneezing, mucous discharge, varying in thickness; headache, lassitude, and finally a general feeling of discomfort.

**Treatment of Nasal Catarrh**—I am one of the old school who feels that a cold is due to a congestion of waste in the body. Consequently the treatment I recommend is primarily elimination by all possible means. When I see the onset of a cold in an athlete, I immediately give him a laxative, make him drink all the hot lemonade or hot weak tea that he can possibly get away with, give him an electric cabinet bath or a very hot tub bath; stuff cotton plugs saturated with 20% Argryol into each nostril for a few minutes, and then send him to bed for a good long sleep. Old fashioned but effective. If the nasal passages are very clogged it may be advisable to use plugs saturated in 1/1000 Adrenaline Chloride solution which tends to loosen the congestion.

The infection from the nose may travel down the posterior nares to infect and inflame the pharynx, causing:—

**Acute Pharyngitis**—Characterized by hoarseness, slight raspy cough, more or less difficulty in swallow-

ing. The tonsils are usually involved, becoming enlarged and uncomfortable.

**Treatment of Pharyngitis (Sore Throat)**—Gargle with a warm, mildly antiseptic, alkaline solution. Glycothymoline, Zonite, Listerine, and all the rest of them are all right and so is plain salt solution, Epsom salts solution, Salt and Bicarbonate (half and half solutions) and the popular Alkaline Antiseptic solution.

From the pharynx the infection may extend down to the larynx and perhaps the trachea:—

**Acute Laryngitis**—Here the cough and the hoarseness are the prominent symptoms. The sputum is rather thick, tenacious. There is a feeling of "heaviness" in the upper chest.

**Treatment for Laryngitis**:—Inhale the vapors of Compound Tincture of Benzoin (see under Supplies). This is a more effective remedy for "sore throat" than all the cough mixtures one can think of. Drink all the hot lemonade possible. "Bake" the upper chest with an Arc or Infra-red lamp. Apply a mustard plaster over night, or if you prefer, rub in some "hot-stuff" liniment or analgesic. Take a laxative.

Traveling down the larynx and the trachea the infection inflames the larger bronchi causing: —

**Acute Bronchitis**:—There is an almost constant cough with the bringing up of considerable thick mucous. The feeling of constriction in the chest, the raspiness and the hoarseness are more pronounced; the patient is probably running a temperature of 101 to 102. He looks and feels "sick".

**Treatment for Acute Bronchitis**:—The same as prescribed for laryngitis, only more intensively. Bronchitis verges on broncho-pneumonia and it behooves

one to be alert in dealing with it. Patient should stay in bed or rest in an easy chair as long as the temperature remains above normal. Inhale the Benzoin. "Bake" the chest. Drink gallons of hot lemonade. Limit diet to hot soups and hot milk. Use a laxative.

Should the infection extend from the larger bronchi to the small bronchioles, your physician will hear a lot of rattling in the chest and will call it: —

**Broncho-Pneumonia**—Which is a serious ailment. The characteristic symptoms are cough, prostration, fever, etc.

The treatment is wholly in the hands of the physician.

**Preventive Measures**:—Every cold, however slight, carries a shroud in its baggage. Too many folks take the attitude: "I guess it will go away of itself." It may. Again, it may not. My advice is:—go at a cold with a vim and knock it out quickly. Do not expose yourself unnecessarily and keep away from those who have colds. If you have a cold, protect everybody else by keeping away from them.

## CONSTIPATION

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

**Treatment**:—Find the cause and remove it. Teach moderation in eating. Assure supply of coarse food, such as whole wheat or bran bread, green vegetables,

dried fruit, especially figs, raisins, and prunes; give exercise to build up the abdominal muscles; instruct not to exercise after meals; encourage long distance hikes; the patient should form the habit of going to stool every morning, either before or after breakfast. He should be warned not to strain at stools. Straining causes "piles" and weakens the surrounding muscles so they lose the power of proper contraction. Warn against the habitual use of laxatives. In acute cases an enema will prove a quicker and more effective remedy.

For chronic constipation the following may be recommended:

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

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

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

## NOCTURNAL EMISSIONS

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

## DIARRHOEA

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

In athletics we frequently find cases of "nervous"

diarrhoea. The probable cause is indigestion and consequent putrefaction due to extreme nervousness on the part of the athlete. It usually occurs on the day of a contest. If slight, ignore. If persistent, give a warm enema to cleanse bowels. Follow with a cold enema to restore tone. A cold sitz bath will further arrest the diarrhoea and restore pep. Paregoric is of little value. Essence or Tincture of Ginger is at times an effective remedy.

### DIPHTHERIA

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

### BURNS

Occur occasionally in training quarters. Cases are generally mild.

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

This treatment is effective for sunburn.

### 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 sen-

sation, 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.

Prescribing one or two Aspirin tablets is a favorite emergency remedy for headaches of any type. There is no objection to the temporary use of any drug but I want to impress upon you the necessity of determining the cause of the headache and removing the former.

**HEMORRHOIDS**

**Cause**—Usually chronic constipation and straining at stools. The veins in the rectum become dilated (varicose), at times rupturing and bleeding. The common symptoms are:—protrusion of a mass, sensitiveness and pain at the anus; bleeding, varying from slight spotting to a profuse haemorrhage.

**Treatment**:—Remove the cause (see treatment of constipation). Apply an astringent ointment (containing ox gall or Extract of Witch Hazel 20%, or a combination of the two). Daily cold sitz baths will invigorate the rectal mucosa and cause a contraction of the dilated veins. Suppositories are helpful to carry one through the acute stages when the pain is pronounced. The mass which usually protrudes after a bowel movement should be gently forced back. If the "pile" becomes irreducible, constricted and painful, consult a surgeon. Haemorrhoids which fail to respond to all these palliative measures are treated in three ways:—

1. Injection of Carbolic acid at base of "pile". This destroys the blood supply of the "pile" which then dries up.
2. Electric coagulation applied at base of "pile" has the same purpose as above.
3. Excision of the haemorrhoids. A comparatively easy operation which disables you for about a week.

**HICCOUGHS**

Hiccoughs are due to the spasmodic contractions of the diaphragm. The causes are numerous.

**Treatment**:—Try any of the following:—

1. Take a deep breath and hold it for as long as possible.

2. Drink plain water or Bicarbonate, sipping steadily.
3. Stick out your tongue, get hold of it with a handkerchief and pull it.
4. Half a teaspoonful of sugar water with 5 drops of Vinegar (Allen).
5. When the above fail give 5 to 7 drops of Ether or Chloroform in water.

**DIABETES MELLITUS**

**"Sugar Disease"**—Some of the early symptoms are:—dryness of the mouth and consequent thirst and the drinking of large quantities of fluid. Frequency of urination. Urine shows presence of sugar. A blood test confirms the diagnosis.

**HERNIA (RUPTURE)**

At the junction of the thigh and the abdomen you will notice a raised ridge of tissue which is caused by the underlying Inguinal ligament. Just above this ligament and running parallel with it are two tunnels (one on each side of the body) which lead from the inside of the abdomen to the scrotum. The same as any tunnel, this one has an inlet (at the abdominal end) and an outlet just before it reaches the scrotum. Through these tunnels runs the spermatic cord of the corresponding side.

Whether due to a natural weakness of the surrounding tissues, a very severe strain, or a combination of these two factors, the inlet becomes dilated permitting the herniation of some of the contents of the abdominal cavity (omentum, small intestine, etc.). Progressively the mass is forced down the inguinal canal, reaches the external ring (outlet) which becomes more

or less dilated allowing the herniation to descend into the scrotal bag.

The symptoms of a hernia are: there is a mass of varying size which enlarges on straining or coughing, feels rather soft and can usually be "reduced" (forced back into the abdomen). There is a feeling of local weakness and a draggy sensation.

**Treatment:**—Thousands of people go through life using trusses for their hernias. A truss is never a cure, but merely a crutch used to protect a weakened part. If the patient's occupation does not call for severe exertion he can sail through life without much discomfort from the hernia. Every now and then a hernia becomes "strangulated" (caught by the margins of the ring and consequently irreducible), and then the matter is serious and calls for an immediate operation.

There is a prevalent feeling among many physical directors that moderate sized hernias can be "cured" with special exercises which aim to build up the lower abdominal muscles. I, frankly, have never seen this done, but if your man refuses an operation there is no harm in trying exercises.

I would advise every young man who has a hernia to have an operation for its repair. The operation is a comparatively simple one, especially in the hands of an experienced surgeon. It appears that there is a susceptibility to infection of the operating wound because of the nearness of the sexual organs, but the infection is a superficial one and merely delays healing. As an interne I saw hundreds of herniotomies in the hospital wards with not a single loss of life.

## ACUTE ARTICULAR RHEUMATISM

There is still some question as to what germ causes this ailment. Diseased tonsils and decayed teeth are thought to be breeding places for the germ. Symptoms vary with the severity of the attack—pain, fever, inflammation and swelling of the joints, prostration. The attack is generally self-limiting, tending to terminate in from two to six weeks. Serious complications are common and there is a tendency to recurrent attacks. The modern treatment consists of absolute rest to protect the heart and the use of large doses of salicylates.

**Treatment:**—Since in 99 out of 100 cases the cause is indigestion or putrefaction of food in the intestines, the remedy is self-evident. Free laxation. Drink large quantities of hot lemonade in order to flush the body. Milk diet for a few days. To relieve the itching apply Lotia Alba.

## INDIGESTION (ACUTE)

A disordered digestion is inimical to effective athletic efforts. An occasional attack of indigestion may be relieved with a dose of Magnesium Oxide, Sodium Bicarbonate or BiSoDol. Hot water with a few drops of Oil of Peppermint helps in many cases. It is advisable to pass up a meal or two after an attack. The drinking of large quantities of hot lemonade serves to flush out the digestive tract.

If these attacks recur it is advisable to refer the case to a physician for a thorough examination. Indigestion is a common symptom of a number of serious diseases and it is best to make sure that it is only indigestion.

**PLEURISY**

Is an inflammation of the serous membrane which lines the walls of the chest cavity and covers the lungs. The usual predisposing cause is exposure when the bodily vitality is at a low ebb. The onset is sudden, the patient noticing a rather sharp pain in some part of the chest which is aggravated when a deep breath is taken. There is a slight hacking cough, fever, headache and chilliness. Treatment:—Rest in bed, strapping with adhesive, laxation, heat.

**PNEUMONIA**

An acute inflammation of one or more lobes of the lungs. The characteristic history is that of a chill, fever, sudden sharp pain in some part of the chest, choppy cough, prostration. When seen, the patient lies on the affected side, his breath comes in short, quick gasps, there is a reddish flush on the cheeks, and the eyes are suffused. The temperature ranges about 103°. Treatment:—Call a physician and get a good nurse. Nursing is absolutely vital in pneumonia and I cannot over-emphasize that.

**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.

**HERPES**—“Shingles”—“Cold Sores”—“Fever Blisters”—Characterized by a well localized group of reddish blebs surrounded by an area of inflammation. These blebs run together, dry up and scale off. The

cause is attributed to an inflammation of a nerve due to some toxin or irritant, such as exposure to the sun, wind, cold, etc.

**Treatment:**—Keep dry and protect from infection. Zinc Stearate is effective in “shingles”. Zinc Oxide ointment seems best for “cold sores”.

**TONSILITIS**

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

**A. Acute Superficial Tonsilitis**—Little swelling, slight pain, swallowing difficult.

**Treatment:**—Give treatment prescribed for “Colds”, since this form of tonsilitis is a form of “cold”. Gargle with warm salt water or Dobell’s solution.

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

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

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

**NEURITIS**

Is a local inflammation of a nerve within its sheath. The cause is not quite clear but it is assumed that

exposure, germs, toxins, alcohol and a number of diseases (diabetes, etc.) are the mischief makers. The chief symptom is pain which radiates along the course of the nerve, which is tender to the touch.

**Treatment:**—Find the probable cause and remove it. Rest the limb by strapping and supporting with a bandage, if necessary. Apply heat in any of its forms. Diathermy is the best of the latter. Infra-red and the therapeutic lamps are alternatives. As soon as the acute pain subsides, start massaging the limb in order to prevent atrophy of the muscles. If neuritis is left untreated or is improperly treated the limb will never again be restored to normal. Work with your medical adviser to save the effectiveness of the limb. Sinusoidal currents serve to re-invigorate the nerve.

**Sciatica**—Is a neuritis of the sciatic nerve.

### 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.

### URTICARIA "Hives"

A crop of white and pink wheals which come and go. These wheals are of all sizes, irregular in form, whitish in center with red borders, spotting the whole body, cropping out even as you observe, fading, re-appearing, itching intensely. The cause is usually a digestive disorder. Some medications may bring them

out. It is attributed to the toxic effect of some substances taken into the blood stream.

### INFLUENZA

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

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

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

### SYPHILIS

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

### GONORRHEA

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

## CHAPTER XIII

### THE TRAINING ROOM

The equipment of a training room varies primarily with the financial outlay. Where the athletic director and perhaps the athletic board of control appreciate the vast importance of training in the success of the teams, the equipment will be all sufficient. Most of the Eastern universities have model training rooms, the equipment of which rivals that of the best known physiotherapy clinics anywhere. A few of the smaller colleges take great pride in their training rooms. For example, Frank Kavanaugh at St. Lawrence University, a comparatively small school, has a training room which is the talk of the North-East. There are any number of high schools who manage to purchase paraphernalia which appears to be of use in the care of their athletes.

I am frequently asked to outline the minimum equipment of a training room. My list usually includes:—

A first aid cabinet, with glass stoppered bottles to hold the liquid medications. (Cost \$50-\$60.)

One or more massage tables, preferably of cast steel, because the latter assures cleanliness and durability. (Cost of each \$35.)

One Infra-Red lamp (cost \$15) and a number of the cheaper portable heat lamps (cost of each \$5).

One Baker (minimum cost \$55).

One gymnasium scale (cost \$35).

One percussion douche hose and nozzle (cost \$5).

One Sanette waste can (cost \$3.50).

And an assortment of the smaller items listed below.

### SUPPLIES

**Alcohol**—Use as:—an antiseptic; to toughen the skin; as an ingredient of rubbing mixtures; for sterilization of surgical instruments. Medicated alcohol is just as good for our purposes as is the pure grain alcohol. The adulterant added to make it undrinkable is harmful only to parched throats and starved stomachs.

**Mercurochrome**—Here is an antiseptic which has come into general favor because it does not "burn" when applied. There is still some question as to whether it is as efficient an antiseptic as is Tr. Iodine, but the medical profession has taken it up, it is being used in surgery, and there is no reason why trainers should hesitate in adopting it.

**Tr. Iodine**—Still the royal antiseptic—old and reliable. Do not coat too heavily with it; do not cover an iodized surface with adhesive or heavy dressings.

**Iodine Powders**—There are a number of powdered iodine preparations on the market, such as Bismuth Formic Iodide, etc. These are all effective antiseptics, deodorants, and serve to dry up "weeping" wounds.

**Hydrogen Peroxide**—Rarely used except for superficial wounds. It is most effective for the destruction of pus cocci.

Peroxide should not be poured into cavities, since the oxidized pus forms toxins which are injurious to the surrounding tissues.

**Boric Acid**—A mild antiseptic used for application to mucous surfaces such as the conjunctiva of the eye. May be used as a drying powder.

**Bichloride of Mercury**—Is a very strong germicide. Use infrequently to abort an impending infection.

**Carbolic Acid**—Another powerful germicide. Frequent or heavy applications may cause gangrene (death) of tissue. Avoid its use. In athletics the only time you are justified in trying its effect is to paint a festering wound or ulcer which has failed to respond to routine treatment. After painting with a 5% solution of Carbolic Acid, immediately wash it off with alcohol. Under no circumstances should you ever apply a dressing containing Carbolic acid or pour it into a cavity.

**Collodion**—Antiseptic and protective. Good for small wounds.

**Tincture of Benzoin**—A resinous balsam, antiseptic, protective and astringent. On drying it forms a water-proof covering. Used chiefly as an antiseptic and to toughen the skin of the feet. Mixed with water and a little resin it makes an effective "anti-fumble" application for the hands.

**Compound Tincture of Benzoin**—Is not as good an astringent as the plain Tr. of Benzoin. It contains a number of medications which help to allay the inflammation and irritation of the air passages such as occur in colds, coughs, etc. The dose is one teaspoonful to a quart of water. The mixture is brought to a boil in a kettle or an oil can which should have a nozzle. Instruct the patient to inhale the steam and Ben-

zoin vapors through the mouth. The treatment should be repeated every two hours until relief is obtained.

**Tannic Acid**—An effective astringent favored by many coaches. Used to toughen the skin of the feet. Tablespoonful to a quart of water. Buy it by the pound in powdered form.

**Alum**—Another effective astringent. Teaspoonful to a pint of water.

**Formalin**—The 1% solution is used occasionally to "pickle" the feet.

**Foot Powder**—Helps to reduce friction between the sox and the feet to a minimum. Use a mixture of Talcum, Boric acid and Tannic acid.

**Talcum Powder**—Used for the same purpose as above. Also to avoid chafing.

**Zinc Stearate**—Very useful to anticipate or heal skin irritations of any type.

**Sodium Bicarbonate and Picric Acid**—Keep some of each on hand in case of burns. **Carron Oil** is another useful remedy for burns.

**Ungentine**—Is a patented preparation and, as a rule, it is not considered good taste to recommend patent medications. However, this is an ointment that has been doing great service in the care of athletic wounds and it is no more than fair that we admit it and recommend it. Today we know of no "healing" ointment superior to Ungentine. A fact of interest is that the formula is printed on the container. The ointment comes in handy in many ways. It is antiseptic, hygroscopic, stimulates healing, prevents festering, soothes and allays irritation.

**Balsam of Peru**—Is popular with many physicians as a stimulant to the rapid healing of a wound.

**Ichthyol**—Is an effective remedy of the same type as the two above. Some trainers swear by it. Ichthyol ointment (20%) is a popular application for "drawing" infections such as boils and felons.

**Zinc Oxide Ointment**—Is a well known soothing and healing ointment.

**Boric Acid Ointment**—A bland ointment preferred by some physicians as an application to irritated surfaces which are not infected.

**Yellow Oxide of Mercury Ointment**—Is widely used as a remedy for "gym itch".

**Aspirin**—A popular remedy for headaches and fevers. I would use it only for temporary relief.

**Smelling Salts**—Be careful when making use of it. Don't shove it right under the patient's nose but rather keep it near the nose. A hearty sniff may throw your patient into shock.

**Aromatic Spirits of Ammonia**—For a sick stomach. Dose:—a teaspoonful in a wineglassful of water. It can be purchased in the form of capsules which are broken in case of need and held near patient's nose.

**Soda Mint Tablets**—Help allay gastric distress incidental to indigestion.

**Alkaline Antiseptic Solution**—Keep plenty of it on hand. For sore throat, gargle with it every two hours.

**Epsom Salts**—An effective remedy for constipation. Don't make a habit of using it. It is to be recommended only as a temporary remedy when patient is in need of a purgative. Dose:—tablespoonful in glassful of water, best taken on arising in the morning. Quite popular with many physicians for "wet" dressings.

**Phenophtalein Pills**—Are sold under various trade names, such as Thalophen, Phenolax, etc. Used for laxation.

**Salicylic Acid (20% in Collodion)**—Useful for softening corns and calluses. Salicylic acid ointment (20%) is another effective remedy for "gym itch".

**Rubber Solvent**—Benzine, Chloroform, Ether, or a combination of these are all effective in removing adhesive. Keep away from flame.

**Acetate Dope**—Recommended by Dr. Allen. It is a liquid which on exposure to the air solidifies through evaporation of the fluid ingredients. Dr. Allen recommends it for "starching" and stiffening of dressings where immobilization is indicated. I am not very enthusiastic about the "dope". It undoubtedly does all that is expected of it, but so do Plaster of Paris bandages and the latter are far easier to obtain.

**Silver Nitrate (lunar caustic)**—May be obtained in pencil form, or as a liquid in any desirable strength. It kills tissue. Used in the treatment of soft corns and ingrown nails (which see).

**"Wet Dressings"**—"Wet Applications"—Some physicians favor a mixture of Rubbing Alcohol and Boric acid solution (half and half); others will swear by Epsom salts solution; still others use aluminum acetate; I have always favored a mixture of one part alcohol, two parts witch hazel and one part glycerine. I still feel the last one is the best. The object of "wet dressings" is to stop subcutaneous oozing, promote absorption, stimulate drainage and relieve the tension and pain incidental to an injury.

**Antiphlogistine**—Useful for relieving inflammations and congestions. A chemical compound, the base of which is clay. The clay retains the heat; the

glycerine it contains has antiphlogistic (drawing) powers and Iodine, the other constituent, serves as a counter-irritant. It is used rather extensively in the treatment of athletic injuries. The different methods of application will be found under "Bandaging". Have a spatula for spreading the clay.

**Disinfectant**—It is important to disinfect the training quarters and locker rooms at least once a week.

**Liniment Ingredients:—**

For "Hot Stuff"	For "Rub-Down"
Oil of Wintergreen	Medicated Grain Alcohol
Oil of Eucalyptus	Witch Hazel
Oil of Peppermint	Soap Liniment
Oil of Mustard	Oil of Wintergreen (to spice)
Capsicum	
Chloroform	
Camphorated Oil	
Ammonia Water	

**Mineral Oil, Cotton Seed Oil, Olive Oil**—Are all used as neutral bases for "hot-stuff" liniments.

**Note:—**"Hot-stuff" liniments should never be used for rub-downs. They are counter-irritants to be used locally rather than generally. Any "hot-stuff" massaged in with more or less force will "burn" one up and may severely irritate the skin causing a rash or even blisters. Coat a surface with "hot-stuff" or at most rub it in gently. Oil liniments are best for counter-irritation because they retain their effectiveness for a lengthy period since oils evaporate to a very slight degree. Again oily liniments quickly dissolve the fatty protective layer of the skin and thus are better able to penetrate. The same suggestions apply to the use of analgesics. "Hot-stuff" should be used with care after

a hot bath which opens the pores and makes possible rapid and deep penetration.

**Soap Liniment**—Is a frequently used base for rub-down liniments.

**Analgesics**—The "hot-stuff" ingredients are here embodied in a vaseline or lanolin base. Almost all the analgesics on the market contain Capsicum, Oil of Wintergreen and Menthol in slightly varying proportions. I have never been able to discover any difference in the action of "hot" liniments and "hot" analgesics. "Hot-stuff", under whatever guise, has but one effect; namely, counter-irritation.

**Massage Lubricants**—**Warm Olive Oil** is very soothing; **Cocoa Butter**, pleasant to handle; **Mineral Oil**, odorless, very economical; **Cold Cream**, preferred by many masseurs; **Alboline**, a semi-solid mineral oil recommended by some; **Cocoanut Butter**, odorless.

**Adhesive Tape**—Use the large rolls, 5 yards long by 12 inches wide. These net a great saving over the narrow widths and are rapidly replacing the use of the latter among trainers. Hospitals and infirmaries use only the large rolls. Almost all the brands of adhesive on the market today are of good quality. Every now and then even the most staple brand will go wrong, and Johnson & Johnson warn on their cartons that this may happen. The base of the adhesive is made of rubber which occasionally undergoes a chemical change, ruining the tape. Barring such incidents adhesive will last years. If it appears to be chilled place it next to a radiator.

Lately, skin-colored adhesive has appeared on the market and I can see a lot of uses for it, especially in the taping of the wrists and for face wounds.

If you have to apply a strip of adhesive directly on a wound, flame the adhesive over a fire first—this will serve to sterilize it.

**Black Adhesive**—Friction tape—Some three years ago it occurred to me that trainers ought to make greater use of black tape because it is so much cheaper than the white adhesive. I put it up to the profession and today tens of thousands of pounds of black tape are being used by trainers.

**Band-Aids**—A prepared dressing consisting of gauze and adhesive. Quite handy in a pinch, though its use is limited to the treatment of small wounds.

**Sterile Cotton-wool**—Use the 1-lb. cartons for the training room and the 1 oz. cartons for the field kit. The cheaper grades are used for padding.

**Roller Gauze Bandages**—Use the one, two, two and a half and the three inch widths.

**Sterile Gauze**—Use the 5 yard cartons for the training room and the one yard cartons for the field bag.

**Iodoform Gauze**—Used for drains in pus cavities.

**Ankle Roller Bandages**—Described at length under "Bandaging". No school, however low in finances, can afford to go without them.

**Bandage Rolling Machine**—Helpful in the rewinding of the ankle rollers.

**Corn and Bunion Plasters**—Quite useful in the treatment of small wounds, corns, calluses, etc.

**Oil Silk**—Essential for the protection of the clothing whenever a wet dressing or an antiphlogistine bandage is applied.

**Heavy Surgical Waxed Paper**—Used for the same purpose as the oil silk but is far more economical and therefore preferable.

**Woven Elastic Bandages**—Without rubber—for example, the ACE.

Effective wherever an elastic support is indicated.

**Woven Elastic Adhesive**—A new and quite useful item.

**Para Rubber Elastic Bandages**—Quite useful. 2½ and 3 inch widths chiefly used. The length of these bandages varies from 9 to 15 feet.

**Felt**—White felt may be obtained in any thickness. It is of better quality and appearance than the grey. Considering the uses of felt, the appearance and quality may be ignored and the cheaper grey felt purchased.

**Sponge Rubber**—Use the red rather than the grey, since the former is more durable and has greater elasticity.

**Sea-foam Rubber**—Be sure to have some on hand.

**Vulcanized Fibre, Aluminum, Rubber Sponges, Shoe Leather**—All come in handy when you have to arrange some special protection.

**Powdered Resin**—Is indispensable for the prevention of fumbling on wet days. Baseball players are finding it quite useful. So do gymnasts and pole vaulters.

**Resin-Gum Benzoin Mixture**—Is still more effective in the prevention of fumbling.

**Styrax, Tar, Molasses, Shellac**—Are all used by coaches for the prevention of fumbling.

**Stove Polish**—Containing graphite, Neatsfoot Oil, etc.—Is used to paint the soles of the football shoes on muddy days, to prevent the mud from adhering to the cleats.

**Neatsfoot Oil**—Used for waterproofing all leather wear.

**Saddle Soap**—Used for the cleansing and polishing of footballs and basketballs.

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

**Small Bath Sponges**—For the sponge baths.

**Sea Salt**—For salt sponging.

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

**Electric Heating Pads**—Get one with three heat feeds.

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

**Ice bag, enema bag.**

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

**Atomizers**—For nasal or throat work.

**Spatula.**

**Surgical Dressing Scissors**—5½ inches long.

**Surgical Bandage Scissors**—7 inches long.

**Thermometers.**

**Surgical Tweezers.**

**Lancet.**

**Tongue Depressors and Applicators (wooden).**

**Bier's Suction Cup** for draining of infected cavities.

### **Crutches, Splints.**

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

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

**Field or Trainer's Kit**—Quite indispensable.

**Traveling Trunks**—Choose staunchly built trunks that will stand the wear and tear of arduous trips.

## CHAPTER XIV

## 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.

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 cooperation 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 favor in athletics. There can be no mental alertness without corresponding physical vigor."

One of the biggest crimes in athletics is the misuse of an athlete, especially of immature age.

To say that athletic teams have made good showings without pre-seasonal conditioning is a mighty poor argument. What would they have done if they had been in good condition?

When you get a new idea talk it over with your coaches. They are men of experience and their opinion is sure to prove valuable.

Always see that the visiting team is treated royally. The spirit behind the game must be that of gentlemen.

"Reservoirs of power, available only under great excitement, exist in all of us."

"The response to stimulation after a period of inaction is less vigorous than the response to precisely the same amount of stimulation after the muscle has been exercised for awhile. This fact explains the necessity under which baseball pitchers and other athletes labor of warming-up before they can use their muscles effectively."

Why not warm up swimmers?

Genuine muscular fatigue is rare—most fatigue is more neural than physical. Similarly the loss of weight during practice or a contest is chiefly due to the loss of water through the pores of the skin; but little of the solid tissue is affected.

Muscular exertion means a great use of bodily energy. The body derives energy from the oxidation of carbohydrate foods. It follows that during the

playing season an athlete should be served a liberal quantity of carbohydrate foods daily.

To drink or not to drink—that is the question! Many trainers warn their charges not to drink water during or right after a strenuous workout or a contest. There is a prevalent idea that when water is taken on a "hot" stomach something dire will happen. Well, there is some basis to this. True, the temperature of the stomach doesn't vary an iota because one is exercising. However, just back of the stomach is the solar plexus of nerves. When cold water is suddenly taken into the stomach it appears to chill the neighboring plexus and one gets the sensation of weakness, faintness, nausea and distension.

If, however, cool, rather than cold water and in moderate amounts be taken, no discomfort or harm will follow. I have worked on this problem for over a year and a half and am sure of the correctness of the above. Athletes, particularly those participating in sports producing profuse sweating, should drink all the water they crave and a little more, but I repeat, the water should be cool, not cold, and taken in moderate amounts at a time.

"The spirit of emulation and contest is a natural one and a noble one, and the spectacle of skilled athletes matching their powers in a fair, generous, courageous struggle for mastery, is inspiring, calculated to sustain interest in gymnastics and to supply that incentive which stimulates endeavor and counteracts the monotony of bearing, in decision of character, in quickness of judgment and in practice."

"Athletics are a splendid training in self-restraint, in chivalric resource in emergency."

If you come across something of value in connection with training, conditioning, or the treatment of athletic injuries, I'll be thankful if you will drop me a line addressed:— "Dr. S. E. Bilik, 200 Fifth Ave., New York City." Incidentally, any coach or trainer visiting New York is cordially invited to drop in at my office for a chat.

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