

after the accident has occurred for the purpose of determining the existence of organic disease which may have been present before. He has pointed out the fact that changes which take place in the nervous system as a result of organic disease do not show themselves for some little time thereafter. If we make an examination early, we can determine with a reasonable degree of certainty whether such changes occurred before or subsequent to the accident.

The essayist has pointed out the difference between organic lesions and hysterical and neurasthenic conditions. This is a matter of very great importance, for there are many practitioners of surgery who, in their examinations of these patients, are unable to make these distinctions, and it is very fortunate that Dr. Eskridge has directed our attention to some of the most important points. I have been associated more or less with neurologists in making these examinations. I have also read much of what neurologists have said and written and I have gained the impression that there is a certain class of special pleaders for patients who have claims against railroad corporations. I have seen so much of this as to lose confidence in the opinions of many neurologists. Not long ago I had an opportunity of examining a patient in whom a so-called neurologist contended that extensive lesions might occur in the spinal cord without giving rise to any objective signs whatever; that the reflexes may be in a perfectly normal condition, and yet there may be extensive inflammatory foci in the spinal cord. This was new to me. The gentleman said he had made a number of post-mortem examinations, and had exhibited slides showing the condition of the spinal cord in cases where there had been no objective symptoms whatever.

Another point which might be taken into consideration here, especially in women, is the existence of pelvic troubles that give rise to neurasthenic symptoms which are attributed to an accident or injury when such injury occurs. Not long since I examined a patient in whom an injury, at the beginning, of a different character was alleged. The patient had sat violently down on the floor of a car, and claimed to have fractured the coccyx. For a long time the claim was based on this condition, but as no objective signs of this fracture could be elicited the claim was abandoned, and a suit subsequently instituted in which either neurasthenia or spinal cord lesions of a very general and indefinite pathologic basis were offered, and when the case came up for final examination the neurologist, to whom I have referred, stated as his belief that there were inflammatory points in the spinal cord, and when asked to produce evidence for these lesions, he was unwilling to point them out, and simply presumed on the information of other fellows who were associated in the case. He asserted that he had seen a number of patients in whom there were focal points of inflammation, in which the deep reflexes were not affected in any way, who, were incurable, and which made the case hopeless.

DR. JOHN E. OWENS, Chicago—While I have not very much to say on this paper, I should regret very much to have it pass without expressing my appreciation of its value to the Academy. I do not believe that surgeons, as a rule, are experts in neurologic fields, and when diseases of this class present themselves to us, it is very essential for us to call competent neurologists to our aid. In other words, the head of no practitioner in this country is large enough to take in all branches of the practice of medicine. The idea that it is has long ago been laid aside by the thinkers in the medical profession, and the appointment of gentlemen representing this field of work in connection with our railroads is a step in the right direction. We certainly very frequently have to avail ourselves of their services in discussing these cases. This paper culls from the monumental work of the neuropathologists and narrows the borders of the subjects which we, as practical surgeons, are the most interested in, that is, those cases of nervous aberrations that grow out of real and alleged surgical injuries. It places the matter within our grasp. When it is published in our Transactions, it will be very convenient for us to refer to it, as I shall do, in studying the differential diagnosis of the various nervous aberrations which we have to meet.

**Scandinavian Congress.**—The third Northern Congress of Internal Medicine will be held at Copenhagen, July 26 to 28. Serumtherapy is the chief subject for discussion.

## TREATMENT IN COMPOUND, COMPOUND COMMINUTED, AND NON-UNION OR UNUNITED FRACTURES.\*

BY C. D. EVANS, M.D.

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In placing before this society a simple contrivance for the treatment of compound, compound comminuted and non-union or ununited fractures I somewhat hesitate, for fear that it may be looked upon as an individual or special splint, a fancy of my own, or as so many have, a "hobby." This I must leave for your consideration. This appliance I have used as much for after-treatment where operation was necessary as I have for fractures alone. It is the operation for the ununited fracture to which I wish to call especial attention. I can better describe the operation, splint and dressings by reporting the following case:

Charles L., aged 32, presented fracture of the upper part of the lower third of his right leg. He was a miner, Irish, and with good family history, no constitutional troubles, no previous sickness, excepting in childhood, and no history of venereal nor hereditary disease.

The accident occurred March 15, 1899. He fell from a railroad train, striking his leg against some object. The leg was at once put in a plaster cast from the toes to the knee, and three weeks later he was taken to the hospital. Two weeks after being in the hospital this cast was removed. The fracture was not united, and the cast was replaced by one enclosing the leg and the thigh. Four weeks later he left the hospital on crutches, with a spint on the limb, suffering pain on motion and exercise in the region of the fracture. One week later, making in all ten weeks, the cast was removed and the fracture found still ununited.

May 31 he came under my care and entered the hospital at Columbus, eleven weeks after the accident, and I found the following conditions: Leg badly swollen and painful small opening in the leg at the seat of fracture, on the anterior surface, and motion of the fragments free. By motion and rubbing of the fragments I could get very indistinct crepitus. After a thorough examination I resorted to the following operation, June 20: The foot and leg were made thoroughly aseptic. On the outer side of the leg, one-half inch from the crest of the tibia and two inches above the seat of fracture, I began the incision, extending it to the inner side and across the tibia two inches, making a short curve; then one was made down the inner side of the leg and beyond the inner margin of the tibia to a point two inches below the fracture; making a short curve as before, it then turned outward across the leg and tibia to a point corresponding to the upper incision. The flap with the fascia was dissected and turned to the outer side and entrusted to an assistant.

The fibula was found in thoroughly good condition and in my judgment not in need of operative interference. An incision was next made on the crest of the tibia down to the bone, the whole length of the opening. The periosteum was turned back and dissected from both fragments toward the fracture. (The reason I give for this dissection of the periosteum is that I secure more for the recovering of the bone than I would have done by dissecting from the seat of the fracture up and down.) The provisional callus and ligamentous growth markedly interfered with knowing just where the true

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periosteum began, therefore I saved from one-half to three-fourths of an inch of the latter, which I think would otherwise have been lost. The bone freed of periosteum in this manner, I used a chain saw and removed the thickened growth until true bone was secured. The fracture being a little irregular, I sawed in the line of fracture, in all losing about five-eighths of an inch of bony structure, not enough but that the fragments could easily be approximated. This being accomplished, I drilled, using a small-sized drill, three holes in each

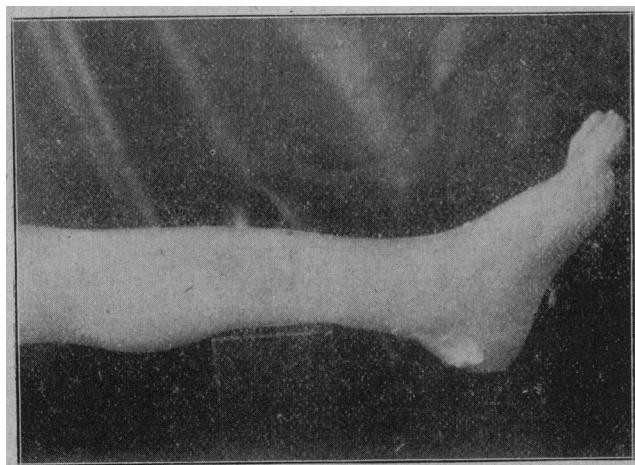


FIGURE 1.

fragment, viz: crest, outer and inner side of the tibia. These holes were directed toward each other so that they would come in exact apposition, and none were allowed to enter the medullary canal. A half-curved needle was armed with No. 3 chromicized catgut and easily passed through the openings in each fragment. The fragments held well together, the catgut securely tied, and the periosteum brought together, the wound was closed by interrupted sutures, dressed with Tursche's powder and bichlorid gauze, and bandaged just far enough to cover

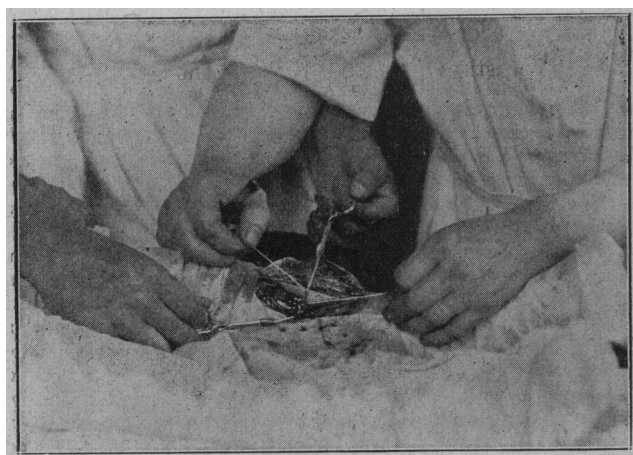


FIGURE 2.

the wound. Then the most important part in the treatment of compound and compound comminuted fractures and operations for securing the bone was attempted. Photograph No. 1 shows the leg before operation; Photograph No. 2, operation; Photograph No. 3, the first part of the plaster dressing or splint.

The wound closed by first intention in the patient above, and the cast was removed July 15. A cast was put on to cover the leg from the toes to the knee, to keep the limb firm and to allow the patient to get out of bed.

The last cast was removed July 29, and the limb is now in perfect repair and in continued use.

When preparing for the operation I secure what is known as "band iron." This I shape to the sound leg, in this case extending from one to two inches beyond the toes, back two or three inches above the knee. The iron is shaped to fit the leg except that at the seat of fracture I make a loop in the iron so as to raise it about two inches above the wound, admitting a thorough asepsis in after-dressing, should it be required. Having this properly shaped, the operation over and the wound band-

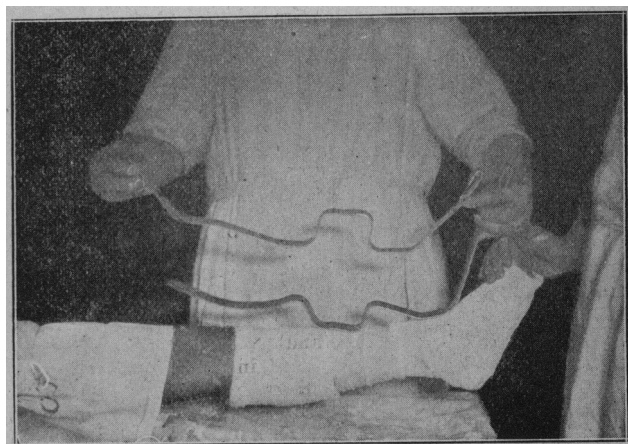


FIGURE 3.

aged, I cover the limb as far as necessary with raw cotton, in this case from the toes to the knee. I then enclose the foot and leg as far up as the lower end of the bandages, and also do this from the upper end of the wound as far up as the knee. I then tear the cotton around the leg in the center between the plaster-of-Paris dressing, and over the wound turn it back between the plaster, making a sort of cuff. I do this at the toes and the knee also. The irons are then placed on the anterior and posterior surface of the leg, held securely by



FIGURE 4.

two assistants, and firm plaster-of-Paris bandages are applied as before and of sufficient thickness to secure the particular fracture; turning back the cotton in this manner leaves no rough edges. When this is dry I supply the open space between the plaster and over the wound with more cotton and a well-tightened roller bandage, thus leaving the limb with equal pressure from the toes to the knee.

Photograph No. 4 gives an idea of applying the irons. Photograph No. 5 shows the splint complete. The iron

on the anterior surface is so bent upon itself that it makes a hook for the attachment of a rope to suspend the limb. This is done by securing two upright pieces about five feet long—one by three inches—to the foot and head of the bed, and with a piece of one-inch rope a little longer than the bed placed in these upright pieces, a pulley on the gas pipe, the rope in the pulley hook, the patient has the freedom of the bed. Photograph No. 6 shows the patient in bed and the dressing removed just before taking off the splint.

There are three principal features to which I wish to call especial attention: 1. The mode of securing apposition of the fragments of bone. 2. The simplicity of the appliance to keep the fragments in apposition. 3. The advantage of dressing the wound thoroughly aseptically.

The only material I used to secure bony apposition was catgut, No. 3. The secret in the successful treatment of this character of injury is to absolutely immobilize the fragments after securing apposition, and not forcing the bony structure to be subjected to for-

upper as well as for the lower limbs, for some years, and have never had a failure, although, with this appliance, I provide for failure, in this: that should any derangement of the soft tissues occur, or the fracture prove unsatisfactory, the wound can be dressed and redressed with the fragments in perfect apposition.

It would seem to me that the most important part in the treatment of this character of injuries and the after-treatment of operative measures for this class of operations is to have complete control of the limb by external appliances, and in no way jeopardize the limb or the patient by using foreign substances in the bone. Therefore, I want to say more particularly, to bring out the sentiment of this society, in full discussion, that the day for using wire sutures, ivory pegs, iron nails, clamp screws, or any other foreign substance in bony structures that will not readily absorb, more particularly where the soft parts are kept open, is fast drawing to a close.

I make reference to fourteen other patients, the ages varying from 14 to 60 years.

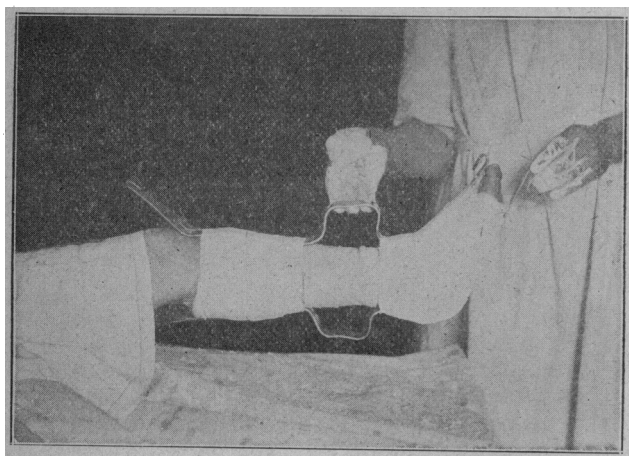


FIGURE 5.

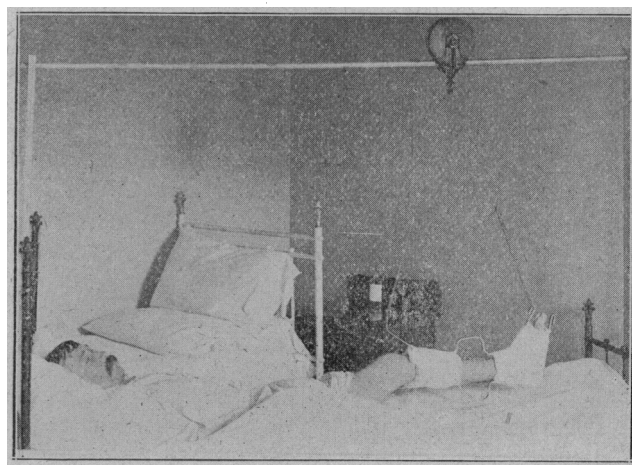


FIGURE 6.

ign bodies more than is absolutely necessary to reach the object to be attained, that of immobilization.

The simplicity of the splint or appliance to keep the fragments in their position is that the iron can be secured at any hardware store or tinshop, and can be had at all times. The iron is easily bent and moulded to suit the limb and fractures, a little mechanical ingenuity and practical knowledge of anatomy are all that is necessary to make it a perfect success.

The mode of dressing the wounds can be made absolutely aseptic. Two pieces of rubber dam, 8x12 inches, with a V-shaped piece cut out of the long side, the V-shaped piece being a little less than the diameter of the limb, and sterilized at each dressing, should be drawn tightly around the limb at the end of the plaster dressing, and under the iron and securely fastened by safety-pins; the rubber turned back, forming a cuff over the plaster cast, admits of thorough washing and dressing.

Just a word more regarding compound and ununited fractures: There are many authors and individual writers who say that injuries of this character should never be enclosed in plaster-of-Paris dressing. While this is true in part, they fail to tell us by what absolute measures we can secure the limb by external appliances. The rule I follow in compound and compound comminuted fractures is first to reduce to a simple fracture, and under the greatest aseptic measures. I have used this appliance for compound, compound comminuted fractures, and splint or dressing for the

#### DISCUSSION.

DR. THOMAS B. LACEY, Council Bluffs, Iowa—In regard to the strap or band around the splint as suggested in the paper, I am inclined to think it is simply a modification of the old method used in applying interrupted plaster-of-Paris dressing for fractures, which in some text-books is illustrated in much the same way, with loop made, if necessary two loops, and a little turn by which the limb can be suspended from pulleys in the ceiling or by anything crossed over the bed that gives a chance to attach to it.

As to the use of catgut to secure apposition in the case mentioned by him, it occurs to me that the catgut does not amount to very much as the essayist applies it, except in one particular, namely, that it holds the ends of the fractured fragments in apposition until he can apply his dressing, then he has no further use for the catgut. It may take him three-quarters of an hour to apply the dressing and have hardening take place, so that the external apparatus will retain the fractured fragments in their position. It occurs to me that this is all catgut is expected to do in this case, and that it simply holds the fractured fragments in close apposition until such time as the fragment has been hardened, and at the end of an hour or more he has no further use for the catgut, and it serves no further purpose. Whether we would be satisfied with the use of catgut or any other suture material, and have its purpose ended in one hour, and from that time on have it serve no further purpose, there is room for doubt. I would like to use some article in its place which will at least give us forty days' partial support, in addition to the dressing that he suggests in his paper.

DR. W. W. GRANT—What do you secure it with?

DR. LACEY—The essayist says that he does not use wire, I

believe, but wire is used extensively and frequently in these cases. The use of wire has been suggested by Dr. Lemen, and while I do not wish to anticipate him in the discussion of this paper, he suggests the use of silkworm gut, which will persist and give support. I think the ivory pegs are good; they will in a measure be absorbed, but we must be absolutely sure that they are thoroughly aseptic before being placed in position. Whatever we use should be introduced in such a way that the medullary canal is entirely avoided. In some of our text-books reference is made to the use of silver or plated wire. I think copper wire plated with silver has a greater tensile strength than silver wire itself, and that it will, perhaps, serve a better purpose. However, in some of our text-books you will see by the description and by the plates used, that the wire is at times passed directly through the full diameter of the bone, it, of course, passing through the medullary canal. This is objectionable and is the source of considerable trouble, as well as failure, in many cases in which failures are reported. It is easy to avoid the medullary canal, either by boring from the end of the fragment upward and to the surface, or by drilling through, just taking the compact tissue, and going sufficiently high to avoid passing through the medullary canal.

As to the use of wire, silver wire alone is a rather difficult thing unless you use large-sized wire, or unless you take two or three strands of moderate size and twist them together, making one cable, because silver wire, although you place it in position and get close coaptation for the time being, breaks too easily. If it should break in manipulating it, it would do absolutely no good and had better be out. Plated copper wire has, therefore, greater tensile strength and will not break so easily.

DR. LEMEN, Denver, Colo.—In regard to the treatment of fractures, there are three cardinal principles which should invariably be observed: 1, the diagnosis; 2, apposition, placing the fragments in accurate apposition; 3, retaining the fragments in position. In order to hold a fracture in apposition, you must have what we call a fixed dressing. A dressing that is absolutely fixed, which retains the fragments in position, is what we desire. I must criticize the Doctor's application of the plaster a little. In a limb that is entirely encompassed by a plaster-of-Paris dressing, it may be applied ever so snugly and thick at the time, yet in forty-eight hours after, owing to drawing out of the dressing and of pressure on the muscular tissue, more or less shrinking of the limb is produced. Then you have what is supposed to be a fixed appliance, but one that is badly in need of fixation; in other words, you have motion. In such cases catgut does not retain the fragments in position sufficiently long. The dressings, strings, or wire must be used longer than one hour. You will have good results where there is more or less motion. The more motion you have, the greater will be the amount of callus thrown out. You will have union. I have used ivory pegs; I have likewise used iron nails for uniting the fragments, but for the last six years I have employed silkworm gut, because it is stronger than silver wire. When you use the latter and twist it and tie it tight enough to make perfect apposition, you have a large knot which is a menace to the soft parts. By using silkworm gut and making three loops, bringing it taut, it holds firmly. It makes a buried suture, and Nature takes care of it. I have never had an opportunity of dissecting these wires afterward, to see the results, but I know that my results have been good. (Here Dr. Lemen demonstrated his method of treating a fracture in the middle or upper third of the leg.)

DR. W. RUMML, Cedar Rapids, Iowa—In treating a fracture below the knee it is very important to fix the knee-joint as well as the ankle-joint. I do not hesitate to apply a plaster-of-Paris dressing at once. In a case of compound fracture I thoroughly cleanse the wound, apply a large gauze dressing and absorbent cotton. In applying the plaster I use a roller gauze plaster-of-Paris bandage, and run it up well above the knee. I believe it is absolutely impossible to retain the fractured fragments in apposition without fixing both joints; in other words, completely immobilizing the fracture. The patient is kept in bed with the leg slightly raised, knee slightly bent; thus lessening tension on the heel tendons. If the cast does not include the knee-joint there is the possibility of a man moving the leg in the cast. If the knee-joint is fixed, however, this is

overcome. I use iron wire in wiring bones, and what is called stove-pipe wire. I find it efficient. I use sutures ordinarily in the manner described by Dr. Lacey, but the most important part is the after-dressing, which should immobilize the fractured fragments.

DR. E. W. LEE, Omaha, Neb.—I wish to emphasize what Dr. Lemen has said in regard to the plaster-of-Paris bandage; instead of having it entirely encircle the limb, I would have it in the form of a side splint, so that it can be readjusted as the atrophy of the muscle takes place, from pressure and swelling becoming reduced. The plaster-of-Paris bandage can then be adjusted and brought into closer apposition to the limb, and in consequence the limb can be immobilized.

With reference to the use of silver wire, my experience has taught me that it gives very little trouble, and that there is very little danger, if any, of going through the medullary canal. A case that impressed this very firmly on my mind was one of compound comminuted fracture of the humerus, produced by a pistol ball, and in which non-union was the result, owing, in the first place, to a portion of the ball remaining between the fractured ends, so that when the case came under my observation there was a discharging sinus and ununited fracture. I opened the wound, and removed the portion of the ball that remained—about half of it; the fractured ends were soft and granular; I brought each fragment from outside the skin, cut them off slantingly, brought them together, and put four holes through each fragment clear through the bone, inserted a large silver wire, about the size of the largest string of a guitar, and twisted it, giving each one three or four twists, left about one-quarter of an inch twist, and brought it next to the bone where I peeled the periosteum back, and the arm then was in this position (illustrating). The patient was still under an anesthetic; I took the arm, held it in this manner (illustrating), and the silver wire held the bone, so that the arm did not sustain its own weight. I then used ordinary antiseptic dressings, and within forty days the man was able to use his arm, and has had a strong one ever since. The silver wire became encysted and has caused no irritation whatever. I do not use the solid silver wire, but copper wire silver plated, and in that case it worked eminently satisfactorily; I see no reason why we should not continue to use it.

So far as catgut is concerned, unless we have absolute confidence in it, it is liable to prove a source of great danger.

DR. JAMES A. QUINN, St. Paul, Minn.—I wish to say that in the past six months I have wired more than a dozen bones in cases of delayed union, or what I would call non-union. I have used copper wire plated with silver, which I prefer on account of its tensile strength. While I have gone through the medullary canal, I have not seen any untoward symptoms from so doing, and the testimony of my patients is satisfactory. If catgut can be so prepared that it will last and not be absorbed inside of forty days, preferably sixty days, I see no objections to it. On the contrary, I would welcome it. I have used silkworm gut in these cases, but my preference is copper wire silver plated. Its tensile strength is very much greater than that of silver itself. It has happened to me more than once, when everything was approximated, to have the limb sag and the silver wire break. I am fond of the use of plaster-of-Paris, and I employ it daily and invariably.

DR. C. D. EVANS, closing the discussion—In regard to the medullary canal, I based my statements on what I have seen, and I think that the surgeon who opens the medullary canal to put in a wire suture of any kind is not doing up-to-date surgery. There is no long bone in the 12-year-old subject but can be wired with catgut, or, as Dr. Lemen prefers, with silkworm gut, and when we have a fractured bone we have enough injury to the tissues without the surgeon wilfully making more. The object of the surgeon is to save further injury instead of making it. The fixation of the limb in this splint that I suggest is practically a partial covering of the limb in plaster, and we have all seen, after the application of plaster-of-Paris dressings, as well as of others, the awful mess that is made by soiling these dressings, either by the discharge from the leg or by washing the wound. This splint I have shown you absolutely provides for cleanly dressing; you do not soil the splint, while the wound is absolutely aseptic all the time. In the photograph that is presented you will notice the limb suspended. This suspension can be applied to the arm as well as



to the leg. Even if the splint becomes loose, the leg is in a position where the fragments of bone can not become misplaced. The application of plaster-of-Paris after the manner suggested by Dr. Lemen and Dr. Lee is not scientific, because you can not dress the limb, if necessary. In dressing, you make a smear, you fill it with all sorts of things that may tend to injure the bone or soft parts, and it is absolutely impossible to keep it clean.

DR. LEMEN—I put on a dressing and usually a rubber dam over the opening the same as you do.

DR. EVANS—You did not explain that in your previous remarks. When you apply plaster-of-Paris on a leg from the toes to the knee and suspend the limb by pulley, you have fixation at the knee-joint so long as the limb is suspended and the patient is in bed. This splint provides for nutrition while loosening of the limb or atrophy is taking place. I always like to see a little loosening in the upper part of the splint or around the limb from the atrophy that is taking place, because it admits air, and that air is nourishment to the limb.

### TREATMENT OF MINOR TRAUMATISMS.\*

BY R. HARVEY REED, M.D.

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The frequency of minor injuries warrants more attention to their treatment than, as a rule, is given. The danger of severe infection from the most trivial wounds warrants our closest attention to this class of injuries.

During the last two years, my records show that I have treated on an average about one thousand minor injuries each year. Among these I have seen some of the most grave cases of infection arise from trivial accidents, so insignificant that those who were afflicted did not think it worth while to go to the surgeon's office and have them cared for, until they found that instead of repairing, they were getting worse, and oftentimes when they would apply for treatment they had already suffered from chill, and septic infection had set in.

A patient who is now convalescing in the Wyoming General Hospital will illustrate this subject. A young man, in the prime of life, ran a small splinter into the thumb of the left hand. He removed the splinter and paid no attention to it until about five days later, when he came in, suffering from rigors, headache and general lassitude, with a furred tongue; on examining the thumb, I found it swollen and inflamed, with a red streak following the line of the lymphatics of the arm to the shoulder, but especially was it noticeable in the forearm. He was sent to the hospital, the thumb was freely lanced, but only a small quantity of pus was discovered. This was evacuated, the wound washed with bichlorid solution and the entire hand, forearm and arm packed in sterilized gauze saturated with bichlorid evaporating solution and covered with christie to prevent evaporation.

Notwithstanding the vigorous treatment which was applied, the arm became intensely swollen, the inflammation extending to the fascia between the flexor muscles of the forearm, causing contraction of the fingers and thumb, which for a time were so painful that it was impossible to straighten them without excruciating pain. As soon, however, as the inflammation had subsided sufficiently, massage was instituted and the fingers and thumb were extended every day, until at the present writing the patient is able to move them and by some effort, and with more or less pain, is enabled to have them nearly straightened. Yet, there is still more

or less thickening of the flexor muscles, which in time we are in hopes will subside and the young man eventually get the use of his hand.

This is only one of numerous instances of a similar character where a slight injury has produced the gravest effects. Many of these injuries to the fingers are followed by suppuration, the sepsis not unfrequently of so severe a character as to extend to the periosteum and even be followed by necrosis of the bone, necessitating amputation, usually the result of carelessness on the part of the patient, who became infected before applying for treatment. I regret to say that we have trivial injuries where patients do apply to the physician and surgeon for treatment, and through carelessness and neglect of strict antisepsis the surgeon allows the wound to become infected and the patient is obliged to suffer the consequences. I recall a case of this kind in which a young man, who was scratched with a piece of glass, became infected, and his first medical attendant added fuel to the fire by putting on a filthy flaxseed poultice. The infection extended along the lymphatics of the right arm until it reached not only the axillary but also the sub-pectoral glands, all of which became not only inflamed but broken down, and we were obliged to remove all the superficial and deep glands, and in operating, we found that the pus had burrowed beneath the pectoralis major muscle to its origin along the anterior aspect of the chest. This young man came near losing his life from a mere scratch, not larger than that made by the point of a pin. It cost him weeks of suffering, besides the general depression which an injury of this kind brings about to the economy. Many physicians are not as fully equipped for caring for this class of wounds as they should be. We also realize that the physiologic resistance in many persons is sufficient to protect them against infection, although it may be present in wounds of a minor character. Yet no one knows the moment this physiologic resistance may fall below par, and infection, such as I have described, follow.

The object of this paper is to impress, more especially on those who have to handle this class of injuries, the importance of treating even the smallest minor injury with the same precaution as though it were a major one. It is true that many of these patients come to the physician or surgeon, no matter how soon they are seen after the accident, thoroughly infected. The nature of their employment is such that it can not be avoided, yet I am convinced, by a reasonably large experience, that there are simple, inexpensive methods by which they can be treated successfully at the physician's office without having the terrible results of septic infection follow such traumatism.

It has been my aim during the last few years to study how best to treat these injuries in such a manner as to obtain the most satisfactory results with the least loss of time to the patient and surgeon, and the least amount of expense. These are all factors which interest everyone concerned in the treatment of this class of injuries.

I trust I shall not be considered egotistic in presenting my method of treating this class of wounds, in the hope that it may be of some benefit and at the same time call forth discussion which will bring to light the experience of others. The method which I have found to be most satisfactory is to wash the injured parts thoroughly with tincture of green soap and a scrub-brush, after which the parts are bathed with a solution which has been abstractly named "bichlorid evaporating solution," and which consists of 80 parts of a 3 per cent. boric acid solution made with distilled water, 10 parts of alcohol, and 10

\*Read before the American Academy of Railway Surgeons, Omaha, Neb., Oct. 12-13, 1899.