Dr. Frank Hartley of New York, and failure to get union; he was sent to me. I took off the splint and in six weeks there was good union. The other case was treated by William T. Bull of New York City; there was a local defect, not general; after wiring and getting no union, the case came to me. I took off the splint and treated it and in four weeks there was a good solid union. The point I would make is this: These cases, and all the cases I have happened to see, have been treated by plaster splints. I would not say that plaster splint makes non-union, but I say in many cases of non-union the effect is due to constriction of the fractured region. When the constriction was removed, when the local congestion was reduced at the point of fracture, union took place. I believe a fracture should not be constricted.

Dr. GALBRAITH—In view of the fact that our discussion is placed on record, I wish to take some exception to Dr. Lemen's remarks; possibly I did not understand his meaning. If my memory serves me right, he cited the fact that all there was to do was to secure and maintain apposition and that in all cases you would secure a perfect result. Now I may be in error in this; if I am I will go no further. If I am correct I should like to say something concerning his treatment.

Dr. LEMEN—I think you understand me correctly; my statement was this: Diagnose your fracture, place it in position, retain it in position, trust to nature, your results are perfect.

Dr. GALBRAITH—I will cite a case and I will be much obliged if the gentleman will advise me regarding the treatment. A lady, 18 years old—she is under my care at the present time—met with an accident in a railroad collision, receiving a fracture of the right clavicle near the shoulder joint, a fracture of the left clavicle near the middle, a fracture of the scapula, a simple fracture of the middle portion of the humerus and a compound fracture of the elbow joint. Repair has taken place at all seats but the third of the simple fractures; there was a rupture of the muscle and I have some deformity of the clavicle and scapula and a non-union at the point described. And I would like to know in a case of this kind, how any man can apply a dressing, how he can secure a perfect apposition and maintain it by any surgical dressing or surgical appliance? The great difficulty in making positive statements of this character is that we may in a short time be confronted, as oftentimes happens when a railroad is sued, with the statements especially of an able man like Dr. Lemen; he is an able surgeon and inasmuch as he has taken this positive stand how can we avoid conflict when we are not having the best results in practice?

Dr. LEMEN—There is just one remark that I would make in addition—and yet I doubt the propriety of making it a matter of record—but I have always looked first upon science and results to be the first consideration, the first duty in the position that I have always occupied, and I do not feel that I should have my views, honest convictions restricted for the mere fear that perhaps it might not suit the railroads or the selfishness of the other corporations that I might work for. I believe we should rise above these things; we should stand upon a higher plane than to allow for one moment the position that we occupy toward a corporation to prevent us from righting ourselves in regard to scientific facts. I perhaps am a little more outspoken than the most of men, but it is due to my bringing up and I perhaps can not help it—built that way.

Dr. GALBRAITH—I do not think the Doctor understood the gist of what I wanted to convey. It was not for the protection of the corporation nor the individual, it was the protection of the surgeon himself. I have a deformity in this case and a non-union, and I do not know how anybody could overcome the difficulty and secure better results than I did; certainly could not apply any dressing, could not secure apposition, on account of the serious complications and multiple combination of the fractures. It was not for the purpose of protecting any corporation—it was simply the individual. I do not feel I am responsible for the result I have got in this case. While the deformity is slight, there is some.

Dr. LEMEN—I believe that it is true in our profession as well as others, there is an exception to all rules and the exception very often proves the rule. But I was speaking about general results.

A Doctor's Button.—A badge as an international insignia for physicians has been recently proposed. It is a button in the form of a circular shield, in the center of which is a modified form of a Maltese cross, opposite the arms of which are the letters "M. S. O. H.," meaning medicine, surgery, obstetrics and hygiene. The button is of gold, and the cross is of red. This may be unnecessary, as the profession is "of the people, for the people and by the people."

COMPOUND COMMUNUTED FRACTURE AT THE KNEE—REPORT OF A CASE.

Read at the Third Annual Meeting of the American Academy of Railway Surgeons, held at Chicago, Sept. 23, 24, and 25, 1896.

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Compound injuries of the knee have at all times been considered most serious in character, more especially when complicated with fracture; in the latter the knife and saw have been considered indispensable, their absence fatal to the life of the patient.

Thus Erichsen (System of Surgery) in speaking of this class of injuries of joints, says: "This is more especially the case when the knee is the articulation injured; extensive laceration of this joint, more particularly complicated with dislocation or comminution of the bones, being cases for early amputation." Later Dr. Ashhurst (International Encyclopedia of Surgery) in discussing "Conditions calling for Amputation" places it more mildly by the remark, "Compound fractures into the knee joint may be considered a cause for amputation," yet when taken in connection with the text may almost be considered imperative.

Since the days of antiseptics, which may not inaptly be termed the New Surgical Dispensation, surgeons have become bolder and conservative treatment has in a measure supplanted the more radical, with varying degrees of success. Each successful case undoubtedly carries with it one or more practical points; and, if the report of the following accomplishes that purpose, the object of this paper will be fulfilled.

S. M., aged 38, Finn, laborer, married. On March 13, 1896, while at work at the base of an ore pile on the P. & C. docks at Conneaut Harbor, about 2:30 p.m., was injured by a mass of frozen ore which rolled down the side of the pyramid and caught his left knee between it and an ore bucket. He was at once conveyed to his home about half a mile distant, and surgical aid summoned. On arrival found Drs. Baker and Tower present. Told them I had been requested by an official of the company to take charge of the case. Had been telephoned for and word returned I could not come, which was a mistake and accounted for my tardiness, as I had only a few moments before received word. Patient was under chloroform, and the doctors assured me that "the head of the tibia was comminuted and the joint open, that finger could be readily passed into the joint through the external wound and fracture plainly felt; that they had adjusted fragments and sutured external wound." By palpation the diagnosis of comminuted fracture was readily confirmed, the head of tibia being broken into at least three pieces; also dislocation of head of fibula with transverse fracture of shaft about an inch below. Inspection also revealed a wound on extero-posterior surface, along lower border condyle of femur, some three inches in length. After explaining to friends the serious character of injury, that amputation might be required, etc., was willing to make an attempt to save the limb, and so decided. The wound was dressed with iodoform gauze, limb placed on a double incline plane well padded with sublimated gauze, and a padded Lewis splint anteriorly, bandaged, and patient conveyed to bed. Morph. gr. $\frac{1}{4}$, to repeat as necessary. Corrosive sublimate solution was freely used from first to last.

8 p.m. Knee and limb swelling, making bandages tight, considerable pain. On removing bandages blood welled freely from wound, which was gaping and stitches tense. Hemorrhage was readily arrested, parts cleansed and redressed. Ice bag applied over knee, which was protected by a folded towel placed underneath bag.

14th, 9 a.m. Still oozing, swelling increasing; limb inclined to roll inward, pain severe notwithstanding morphia. Complains bitterly from slightest motion of the body, evidently splint not meeting requirements and some other device loudly called for. Redressed wound and adjusted as well as possible, ice bag continued.

2 p.m. Assisted by Drs. Tower and Baker, removed double incline plane, bathed limb thoroughly, cor. sub. sol. not forgotten, and placed in a Smith's anterior wire splint with a foot piece; adhesive strips applied to sides of leg and fastened to

foot piece in the ordinary way for extension, splint extending over fully two-thirds of thigh, limb being supported by a continuous series of strips of a common roller bandage $2\frac{1}{2}$ inches wide, whole length of splint, fastened upon either side by pins and then suspended in a Salters cradle. Sutures removed and wound drained by iodoform gauze crowded well into joint, over which was placed iodoform gauze and sublimated cotton, held in position by the strips of bandage supporting limb. Ice bag replaced and morphia as necessary.

15th, 10 A.M. Very little pain since yesterday P.M. Pulse 90, temperature 99.6, tongue coated, bowels inactive, enjoys his pipe, had a fair night. Wound oozing, dressings soiled. Comp. cathar. granules (Whitbeck's) ii, repeat in evening if necessary.

16th, 9:30 A.M. Pulse 90, temperature 99, no action of bowels. Comp. cathartic pills ii every six hours until bowels move.

17th, 9:30 A.M. Pulse 90, temperature 99.6, a costive movement of bowels. Soda et potass. tart. a tablespoonful once in four hours until proper action secured.

18th, 10 A.M. Pulse 90, temperature 99.

19th, 9:30 A.M. Pulse 90, temperature 98.6.

20th, 10:30 A.M. Pulse 90, temperature 98.4. Outer dressing to wound unsoiled for first time.

21st, 10:30 A.M. Very comfortable. Ice bag discontinued.

22d. In redressing wound omitted drainage.

23d. Very little swelling of knee.

25th. For past two days had had a severe pain in middle third of leg, commencing about 5 P.M. and continuing into the night. Pulse 80, temperature 98.4, tongue coated, hydrarg. chlo. mit. gr. ss. once in three hours for three doses (from which bowels moved thoroughly), quinia sul. gr. ii every three hours. Quinia continued for two days with complete relief.

In reviewing the management it is unnecessary to comment on the strict antisepsis which was maintained, the drainage or antiphlogistic of cold as applied by the ice bag. To do so would only be to repeat what has oft been reiterated heretofore; but to the mechanical device, which, to my mind, proved a strong link in the chain leading to the result, I wish to call special attention, not that there is anything in it new or original, for there is not.

The Smith wire splint, with the attached strips of bandage as applied, afforded a bed and support to the limb, held it firmly and secured perfect rest and repose for the injured parts. The facility or ease by which the wound could be reached was also important, to accomplish which we had only to loosen a couple of the strips upon that side, turn them back underneath, or if soiled remove entirely and replace with new, take away the dressings, which were then entirely free, bathe, or do whatever necessary, apply fresh dressings and readjust the strips, all without any handling or moving of the limb whatever; a great convenience, as it was deemed advisable to redress at each visit for some ten days, on account of oozing, and at longer intervals thereafter until healed. Pus was not at any time visible. Strips were carefully examined each

FIG. 1.—Appliance for support of fractured knee.

April 15. Wound closed.

20th. Osseous union fair, motion of joint more than expected, flexed and extended knee quite a number of degrees. Limb heretofore kept slightly flexed, readily straightened. Bathed thoroughly and placed in plaster Paris cast. On the next day (21st) to my surprise found patient dressed, sitting in a chair. He at once commenced getting about on crutches and progressed rapidly.

May 3. Complained of pain in lower third of leg, inner side. Cut off cast, and union appearing good, omitted splint of any kind, simply a cotton compress and bandage. Motion from extreme extension to very near right angle.

The pain continued, sometimes in leg, at others in foot, or in both, of a very severe character, notwithstanding treatment, which was both general and local; among the latter liniments, blisters, cupping, massage, etc., until July 2, when an interrupted galvanic current was used with marked relief, repeated on the 5th, and no complaint since, although it was again used on the 13th. At latter date motion was nearly complete, and used only a light cane in walking.

There is a little deformity on outer side, owing to excessive callus formation and undue prominence of head of fibula, otherwise the result is as complete as could be wished.

FIG. 2.—Support for fracture of knee. Bandages loosened for dressing wound.

day, to see that each remained properly adjusted, or all bearing equally. When we desired to inspect the sides or posterior surface at any point, we loosened one or even two strips on one side; if more desired, readjusted ones already loosened, and proceeded as before. For the anterior surface, simply lifted the covering which had been folded and loosely laid thereon.

By the Salters cradle, in which it was suspended, extension was maintained by the heft of the limb and the pitch of the incline, and thus kept uniform. If the patient moved up in bed (he could readily do so himself unassisted), or if from any cause slid down, the pulley automatically rolled up or down the incline, creating no disturbance. When the patient was moved to the right or left, the position was immediately accommodated by the swivel by which the cross bar was attached to the pulley, thereby affording quite a range, or even allowing the bolstering of the patient without the least inconvenience.

By the cord and hook in the ceiling, or a gallows placed by the side of the bed, the extension is main-

tained by the obliquity of the cord. If increased, then extension is increased; if lessened, extension lessened, until at the perpendicular it becomes null, and if perchance it passes beyond, then we have a crowding; therefore, to have uniformity of extension by this means, it is necessary to secure your patient against any sliding up or down, a very uncomfortable thing for him, but not required by the cradle, hence its advantages. The cradle I have found of inestimable value in severe injuries of the leg necessitating confinement to the bed, no matter what kind of splint was used.

It will be noticed that with the exception of April 20, when passive motion was made simply as a test, the joint was kept in perfect quietude until the removal of the plaster splint, May 3, after which patient was instructed to gently exercise it each day—another refutation of the idea of motion, either passive or otherwise, being essential against ankylosis.

DISCUSSION.

Dr. SCOTT—I happen to be one among the number who believe it is all right to use chlorid of mercury in the joints. While that practice is condemned by some of the leading surgeons, I believe it is justified under certain circumstances, and I believe as a railway surgeon in using chlorid of mercury in the joints. I have used it in the cranium and I believe it can be used in the joints. When we consider the fact that a majority of the wounds which we have to treat in joints are infected when we are first called to see them, full of dirt and various foreign substances, and owing to the fact that we may have some difficulty in removing all foreign substances, all sources of infection, it is justifiable to use an antiseptic for the purpose of destroying those germs that remain. I believe it is good principle and good practice all the way through, and as I said a moment ago, I presume the Doctor's treatment was successful largely on account of the fact that he used drainage and the wound was fortunately situated for the purpose of getting good drainage. In a similar case of my own, a young physician—a young homeopath, by the way—who was afflicted with pulmonary tuberculosis in an advanced stage, but continued the practice of medicine, while whipping his horse one day was kicked on the knee, and the result was a compound comminuted fracture of the tibia which went through the skin and the synovial membrane about an inch and a half long; the lower half of the patella was simply pulverized. I was called to see the man in a short time after the accident. On examination I found the injury I have described, also a lot of dirt on the wound; found some bits of underclothing in the wound, and having gotten him in proper place, I made the opening larger and irrigated the wound thoroughly; and by the way, I believe we can not clean a wound of this character without the use of water in a stream; I do not believe we can clean it by sponging or dropping or anything of that kind, but it needs a good strong stream of water to flow into the cavity in order to flush. I used the bichlorid of mercury, just as the Doctor has stated; after I got through I was not satisfied with the opening that existed in the joint, I stitched up part of it because it would not be of service to me, but I made two openings on either side near the lower part of the joint as far back as I could go, put on the drainage, left a piece of iodoform gauze to the front, placed the limb in an inclined plane, gave the patient a little medicine, I forget what; although he was a homeopath, I think I treated him by the usual methods—he did not ask any question about what he should have—and left him alone; changed the dressing every three or four days, but the result was something surprising, because I was afraid his pulmonary trouble would have some influence on the result. The patient, however, seemed to get no worse during the time he was laid up with this injured joint, and finally made a good recovery, got excellent motion, hardly a bit of sepsis connected with the case. I think the good result in my case was due chiefly to the openings referred to, the excellent drainage and perfect cleanliness and antiseptics combined.

Dr. REED—I was very much pleased with the Doctor's paper and also very much interested in the remarks of Dr. Scott, but I must take some exceptions in reference to one point which each of them recommend, both in the paper and in the remarks on the paper, and that is in reference to drainage. I most fully concur with them that asepsis or antisepsis is one of the secrets of success in the treatment of joint injuries, as well as other

injuries, but as to the use of drainage it is a question in my mind and one which I seriously question, except when you have something to drain. I do not believe drainage adds one particle to the recovery of an injury to a joint or to any other traumatism unless you have absolutely something that you want to drain. If you have suppuration of a joint, I should undoubtedly use drainage. But my experience is that the use of drainage in joint injuries is absolutely useless unless you have something to drain. I used to use drainage in almost every injury, whether of the joint or any other part of the economy, but during the last three or four years I have almost entirely discarded drainage, except when I have had a reason for it. In amputation of the limb I do not use drainage, further than the use of a little gauze for two or three days to assist by capillary attraction the discharge of the liquids as they accumulate, and after that take it away, and in the treatment of joint injuries—and I have had a good many—I have discarded drainage unless I have something to drain. If I adhere to the principles of asepsis or antisepsis I do not have suppuration, hence there is no use for drainage, and I believe you get along as well with asepsis or antisepsis and mobilization. Because when you have drainage you have an opportunity for the introduction of germs into the wound which you do not have if you do not have drainage. And so I must take exception to it, and I base my exception on personal experience as well as the experience of others who were at one time advocates of drainage and have discarded it.

Dr. E. WYLLYS ANDREWS—Admitting the tendency of modern surgery to abolish drainage, yet possibly it is not true that this applies to traumatism equally with the wounds which the surgeon makes in operating. The experiments of Robb and Schimmelbusch have clearly shown that we never really sterilize the skin in its deeper parts. In other words, while we may sterilize the surface of the skin so that it is not possible by mere contact to infect, yet that same skin a few hours later will be septic, because out of its glands material has been poured which carried with it microorganisms, therefore I must say as Dr. Reed has done, surgeons are drifting away from drainage as far as possible, because experience has shown that the moist serum about wounds in every case in twenty-four hours is septic. It is necessarily true that the wound becomes septic where the drainage tube comes out. Why should we assume from that that wounds made through dirty clothing or with blunt or sharp objects themselves septic, should not be subject to the same rule? The writer states that he did not open this wound for twenty-four hours after seeing it, probably because it began to show sepsis, and that would indicate immediate drainage, if not flushing. The knee joint is so complicated that it may almost be said to contain separate pockets, the bearing of which is that to drain a knee joint thoroughly a large number, or more than one opening is invariably necessary, as Dr. Scott has shown. In his case he found for complete drainage it was necessary to make two openings. In order to thoroughly drain a knee joint it is necessary to make several openings; exit must be supplied from six points: one each side of the patella above the condyle; one on each side of the lower border of the condyle, because fluid will gravitate there, and a pair of drainage or a single drainage tube will be necessary well above the patella.

Dr. SCOTT—Dr. Reed made the point that he never used drainage unless he had something to drain. I agree with him, and that is a good rule to practice in general surgery, but I want to make this point: in the knee joint we may have something to drain. Whenever we have a compound comminuted fracture involving the knee joint we have something to drain and if you stitch up your wound the opening in your synovial membrane may close up, you have a sufficient source of irritation there by way of traumatism to cause an outpour of the synovial fluid, even if you have no blood, and you may have both. I believe, laying aside the question of direct infection or the danger of infection following, it is better for that joint that that fluid should escape, and you know it is good practice in simple inflammation of the knee joint to let out the fluid under the skin, and if that is the case in simple uncomplicated inflammation of the knee, why is it not good practice in injuries of this character to let that fluid out? I believe it is the best practice by all means to get that fluid out of there or give it free opportunity to escape.

Dr. REED—I know that the Doctor has taken the ground which has been taken by many eminent surgeons, and a position that I have taken myself in the past but which I have discarded because I find I get along just as well and better without it. We admit that in a compound or comminuted fracture of the knee joint that we have or may have the blood serum, etc., exuding into the joint, but is it necessary for us to drain under all circumstances? Now I say I am in favor of

drainage when necessary, but unless it is necessary I do not want to drain; for instance we have an involved joint lopping off of the condyle in the elbow, does any one think of opening the elbow in a fracture of that joint, and everyone must admit that in that fracture there is blood and serum in the joint. Nobody ever thinks of opening it; yet those cases get well without disturbance or interference of the motion because of immobilizing the joint; the patient gets well and we do not have much trouble with it. I take that as a cause for not opening the joint. If we take the Doctor's argument in question and say because there is blood and serum exuding into the synovial membrane this is a reason for drainage, when we have a condyle fractured and there is exudation of blood and serum we should drain, but we do not drain but depend upon absorption. So in any joint I do not drain and I have better results, unless I have septic material or something of that sort, that would cause a destruction of the knee joint. I base this on my experience, not for argument. I say in my experience in this line of surgery and in treatment of the injury to the knee joint I get better results when I do not drain than when I do, unless I have suppuration or something that is destructive to the knee joint which will not absorb.

Dr. WARD.—It appears I have only been attacked on one part of my platform, and that is drainage. I use my drainage just as I do anything else; when I think it is called for I use it; if not, I do not. If in a given case I have a large amount of oozing, dressing completely soiled through every twenty-four hours, I keep it open; just as soon as it becomes reduced in amount to where I think it safe I remove my drainage and allow my wound to heal. The point also to which I desired to call attention was the appliance, the comfort and convenience of my dressing. I do not know of a man that has ever used such an appliance that would consent to use a double-incline plane for injuries of the leg or knee joint. I have not tried it in fractures of the femur, but I never put it on a person yet but what rejoiced in the comfort it afforded, after having had some other dressing upon the limb.

BURNS AND SCALDS.

Read by title at the Third Annual Meeting of the American Academy of Railway Surgeons, held at Chicago, Ill., Sept. 23, 24 and 25, 1896.

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In our work as railroad surgeons we are often called upon to treat burns and scalds in their various forms and degrees, and nearly as often find an unsatisfactory state of affairs regarding the condition of the patient. The severity of the burn, its first treatment by rough hands, and the time since the infliction of the injury are all important factors. These, together with some hints as to methods of treatment, will be considered.

Often we find a patient begrimed from head to foot with coal dust, oil and cinders, suffering with a severe burn, received hours before, with the injured member drenched in machine or engine oil and wrapped in dirty, oily waste, and an internal drenching of whisky or brandy. This condition must be met promptly, and here begins the tiresome task of cleansing and rendering the parts aseptic. These are the times that try our patience.

With no means at hand to dress wounds in an emergency, especially when "out on a run," our engineers and firemen can not be blamed for doing the best they can; on the other hand, it is a wonder why there are not more serious results following an improper first dressing that has remained for hours favoring, if not producing, sepsis. With modern surgery we are able to meet these emergencies successfully and bring about satisfactory results. How best to do this will claim our attention.

As far as the conditions, treatment and results of burns and scalds are concerned, it is not deemed advisable to lay down any different line of treatment, they are in all things practically identical; therefore the term burns will include both burns and scalds.

While many of the earlier authors classify burns, according to the extent of the injury, in six degrees, the simpler classification — three degrees — is here adopted for the sake of brevity and the further reason that we believe the distinctions in the six degrees are practically unnecessary, and are in a measure confusing. The classification adopted is as follows (International Encyclopedia of Surgery, Ashhurst.):

First degree. Hyperemia, erythema; irritation or inflammation of the skin without vesicles.

Second degree. Vesication; inflammation of the skin; formation of vesicles or bullæ.

Third degree. Eschars; gangrene, superficial or deep, involving the skin or other subcutaneous tissues; carbonization of part or of entire body.

In the first degree there is rarely any constitutional disturbance (it is true that a severe case of sun burn may prove fatal), the diffused redness of the surface, some tingling or smarting pain, and occasionally some swelling are usually the only symptoms manifest; yet in rare instances the internal complications are a serious factor, depending on the patient's constitution, individual peculiarities, the impression on the internal organs being made through the media of the sympathetic and sensory cerebro-spinal nerves. Exfoliation is complete within a few days and the skin is again normal. These symptoms are also found in burns of the second degree, but intensified because of the greater heat producing them, and in addition there is serous effusion and the formation of vesicles, following the intense hyperemia, either appearing at once or within a few hours; in some cases they continue to form for two or three days. It often happens that the vesicles burst because of the rapid effusion; when this occurs the epidermis lies in shriveled whitish folds on the super-sensitive, inflamed skin, causing pain and uneasiness, and when touched this inflamed, raw surface gives rise to intense pain. Sometimes the usually transparent serum is streaked with blood. When there is no ulceration we may find the epidermis replaced in from five to ten days.

The severity of the burn, the condition of the nervous system and susceptibility of the patient influence the constitutional disturbances. Some authors affirm that in this degree, "in severe cases shock with prostration, even immense prostration, is always present." In our experience, typical second degree cases have been treated with shock and prostration practically absent. Death may be instantaneous from collapse, or perhaps more properly neuro-paralysis, from syncope and suffocation (rarely met with in railroad injuries). If death is not sudden (in the common acceptance of the term) it may be prolonged for hours or days and result from collapse, coma, bronchitis, pneumonia, etc., thoracic lesions, lesions of the abdominal viscera, enteritis, hemorrhage, peritonitis, exhaustion, gangrene, septicemia, etc. With intestinal complications, death may result from ulceration.

The definition given of burns of the third degree indicates plainly the prominent symptoms; the eschars vary in depth and extent; the destruction of tissue, depending on the degree of heat and duration, may be of the skin only, or all the soft and bony tissues of a part may be destroyed. This total carbonization, while not common, could easily happen to one pinioned under a wreck.

If the person survives the shock, we have a group of grave conditions to battle with; severe as are the lesions appearing in the second degree, they are not