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ORIGINAL COMMUNICATIONS.

ART. VII.—*On the Treatment of Contracted and Stiff Joints.* By
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The attention of Surgeons has lately been directed to the means of remedying the deformities that result from ankylosis, and very satisfactory statements have been advanced in favor of the plans of treatment recommended. Though it has been well known that practitioners who devote themselves exclusively to orthœpodic surgery, have met with great success in this branch, it has been thought, that the processes by which these results were obtained, were so complicated, tedious and difficult, that the general surgeon could not conveniently carry them out.* It

* Mr. Erichson has recently published in the *Lancet* for Nov. 10th and 17th, 1856, some excellent observations on the above subject, with illustrative cases. In the short article devoted to ankylosis (fifty-six lines,) in his work on Surgery, published in 1853, he appears to have had no practical experience on the subject, and what he says upon treatment is extracted from Mr. Tamplin's useful little treatise. Most of the cases published in the *Lancet* were treated during the previous twelve months. It is to be hoped he will devote his talents to this branch of surgery on which we still require so much information.

is with a view of showing what can be done in the wards of an hospital, and in private practice, in restoring to their functions, limbs considered useless, by means within the reach of the general surgeon, that the following cases are detailed. And I would here remark, that the instruments and means used by me were extremely simple, and that in their employment I do not lay claim to a greater amount of mechanical skill, than falls to the share of most practitioners who are acquainted with the anatomy and pathology of the parts engaged, and who have clear notions of what is expected from treatment. I need not remark that the present observations apply to those cases in which the ankylosis depends upon fibrous and fibro-cartilaginous bands, and alterations in structure of the normal constituents of the joints, and not to true bony union,—though until a recent period, the patient was, in both forms of the disease, allowed to pass through life with a useless limb, or rid himself of the incumbrance by submitting to its amputation.

It is true, that the treatment requires much patience, care, and management; that we are sometimes disappointed when we most expected success, and successful where we had but little hope of proving serviceable; in some cases, the improvement is slow, in others, surprisingly quick; and this uncertainty will attend our practice so long as the actual pathological condition of the joint, and its surrounding structure is enveloped in so much obscurity, for I believe it accords with the experience of most surgeons that we cannot always state, in cases of long standing, presented to us for the first time, whether the greater amount of disease is to be found on the articulating surfaces or in the enveloping structures. The duration of treatment will also depend upon the actual stage of the disease; if inflammation be still active, of course we cannot proceed as rapidly as when it has disappeared, or should it be awakened by our treatment, we shall require more time than if it did not present itself at all. The willingness or disinclination of the patient to assist us, will also exercise an important influence on the success of the treatment adopted, and the co-operation of the patients relatives, in the case of young children is almost indispensable. As most of the points now alluded to will be illustrated by the following cases, I shall not occupy more time by dilating upon them.

CASE I.—*Contraction of Knee Joint—Rapid Extension—Treatment successful.*

A man aged 23, of slender make and delicate appearance, was admitted under my care into St. Patrick's Hospital, March, 1853. The right leg was bent at an acute angle upon the thigh, the result of chronic dis-

ease of the knee joint, there was no dislocation. As he was very anxious to return to the country, I had an instrument applied at once, and found that considerable extension could be made without giving any pain beyond what he could easily endure. A sensation as if some tough membranes were gradually giving way, was evident to the patient and to myself. He was directed how to manage the instrument, and very soon, by extension alone, the leg was stretched so as to allow the descent of the heel to the ground. During the treatment, the knee was kept surrounded by a wet bandage, and the patient was encouraged to walk about the wards, whilst the instrument was applied. Being anxious to go to the States he left the hospital as soon as the above results were obtained. I advised him to wear a small slightly bent splint, fitting into the popliteal space, for some months after his return home.

In this case I was obliged to act with greater promptitude than I should have liked, yet the result was most satisfactory, for he remained only a fortnight in the hospital. An instance is recorded by Mr. Tumpkin, where a patient dreading expulsion from the hospital, for having resisted the surgeon in his efforts at extension, screwed up the instrument during one night to such a degree that he stretched the leg to the right position, from being bent almost at right angles with the thigh. In this case the tendon of the biceps was supposed to have been snapped across, by the forcible extension employed.

CASE II.—Contraction of Knee Joint—Partial dislocation backwards of Tibia—Rapid Extension.

A boy aged 12, of healthy appearance, was admitted into St. Patrick's Hospital under my care, March 10th, 1857.

He had suffered for the three years previous from disease of the left knee joint, which had ended in suppuration, and discharge of matter from one large orifice at the upper and inner side of the patella. There was no fluctuation in the joint, which was distorted from contraction of the leg backwards, with partial dislocation of the tibia in the same direction, there was a good deal of pain in the joint, and the least shock to the limb augmented very much his sufferings. He could hardly allow me to touch the limb. By rest, the internal use of cod liver oil, and iodine solution, and the constant application of a well adjusted wet bandage, all pain had disappeared at the end of a month, and I was pleased to find that I could move the leg, and handle the joint, without any uneasiness to the patient. Seizing upon this favorable opportunity, I applied an extending apparatus, and stretched the leg gradually, almost to a straight position. The patient suffered so little annoyance that he

could bear the stretching for six hours without a murmur. On my next application of the instrument, I had the joint surrounded with cotton wadding, and whilst the limb was kept extended, I applied a starch bandage around the joint, so that when the apparatus was removed at the end of six hours, the bandage had become dry, and a strong mould surrounded the joint, and thus retraction during the night was prevented. By these means, *i. e.*, by daily extension, by the apparatus, and by retaining the joint in its stretched position during the intervals by the starch bandage, the greater portion of the foot was brought to the ground in a week, and he was able to walk across the ward without the aid of a stick, although on his admission he could not move without a crutch and a stick. The improvement continued for the next week, when he was discharged, with directions to present himself occasionally at the hospital.

June 10th.—His parents being anxious he should go to school, prefer keeping him at home during the remainder of the treatment. His health is much improved, he can walk about and play with his school-fellows, and with the assistance of an instrument which is being constructed, I have every reason to believe that the dislocation of the tibia will be overcome, and the limb rendered still more useful.

CASE III.—*Anchylosis of Knee Joint, with Partial Dislocation of Tibia backwards, Gradual Extension, and Division of Tendons.*

A young lady was brought to me from a town in Lower Canada in September, 1855, labouring under the effects of disease of the right knee joint, of two years standing, which had ended in ankylosis, and contraction of the limb. The joint presented the usual appearance of partial dislocation of tibia backwards; the leg was not twisted on the thigh, the foot being in a right line with the axis of the limb. There was still a good deal of tenderness about the joint, and a puffy swelling under the patella was very painful to the touch, and was frequently the seat of pain at night. The leg was bent at an acute angle on the thigh, the heel and foot protruding upwards, and backwards; so that she was obliged to sit on the edge of a chair, as only one natis could be pressed upon. She was also suffering from chronic bronchitis. I commenced treatment by efforts to subdue the existing inflammation, and was so successful after three weeks attendance, as to be able to handle, and gently extend, the leg, without causing any pain; although I met with unusual difficulty from the disinclination manifested by the patient to having any plan of treatment pursued. As my patient was staying with relatives, there was no urgent necessity for adopting any rapid method of treatment; and

as the bronchial affection caused some uneasiness, and the catamenial period had just arrived, I considered it more judicious to attempt remedying the deformity by gradual mechanical extension, whilst the general system was undergoing so important a change. With this view, I had an instrument constructed which admitted the muscles of the limb to be relaxed after extension had been carried on for some hours, and was so constructed that the patient herself, or one of her friends, could manage it. The joint was kept smeared with an ointment of iodide of mercury, and an iodine solution and cod liver oil were taken internally. After two months' use of the instrument, the toes could be brought to the ground; and now, strict injunctions were given to leave off the use of the crutch, and use a cane instead of it. This part of the treatment was very difficult to carry out; for, like most persons who have become accustomed to the support and assistance in progression afforded by a crutch, she found it most difficult to dispense with its use. As the navigation of the *St. Lawrence* was about closing, she returned home, and the same plan of treatment was carried out, not regularly however, by her relatives during the ensuing winter; yet, though the extension had not been advanced, I found that, on her return to Montreal the following summer, that she could walk with the aid of a cane, and even move about without one; and as her health had become improved, and as there was now no pain at all in the joint, it was determined to carry the extension to the fullest degree the condition of the parts would admit of. Instruments of various constructions failed to stretch the limb beyond what would allow of one-half the foot being placed on the ground; the heel was still fully an inch and a half from it; and as further extension seemed prevented by the rigid condition of the tendons of the semi-tendinosus, semi-membranosus and biceps muscles, I resolved to divide them, and thus overcome their resistance. Assisted by Dr. Howard, the oculist, I divided these tendons on the 9th of Oct., 1856, the patient being under the influence of chloroform, and before its effects had passed off, forcible extension to a considerable degree was practised, the joint was enveloped in a wet bandage, and an apparatus applied. There was no pain, swelling or effusion, after the operation; and in the course of a month, the patient could touch the floor with almost the whole of the heel. Indeed, so great was the change, that her parents felt quite satisfied with the improvement already obtained, and wished to allow her to discontinue the use of the instrument, and rely upon the aid of a high-heeled boot. But to this proposition I would not consent; for experience has convinced me, that we should never allow a patient to wear a high-heeled boot, or to use a crutch, if progression can be accomplished without their

assistance ; for, so sure as the heel is prevented descending, and the limb is relieved of its weight-bearing office, the leg will undergo contraction, and the limb will not acquire strength and firmness.

The operation succeeded well ; and, before the patient left Montreal, she could walk out in the streets. She has gone to a daily school since her return to the country, and, with the aid of a cane, can now walk a considerable distance. This improvement has been effected, as it observed, in a limb that was considered irretrievably deformed and useless, and by means, simple, safe and painless.

CASE IV.—*Anchylosis of Knee Joint from Necrosis of Tibia. Extension.*

A boy, aged 13, was admitted into St. Patrick's Hospital, under my care, Sept., 1855. He had suffered from necrosis of the tibia for two years previous to admission, which had terminated in anchylosis and partial dislocation outwards and backwards of the tibia ; the leg being fixed at an angle of about sixty, as regarded the axis of the femur. As there was a large sequestrum to be removed, I had planned to excise it before making efforts to remove the deformity of the leg, when the patient was suddenly attacked with acute pericarditis, and was so feeble on his recovery that I gladly consented to his mother's request, to delay operating until such time as his constitution had been restored by country air and good diet. It was not, however, without self-reproach that I contemplated his condition ; for the disease of the joint was so extensive, the necrosis so far advanced, the sequestrum apparently so large and difficult of extraction, the leg so twisted and flexed on the femur, and the constitution of the boy so much injured by long suffering, and apparently so little capable of restoration, that I blamed myself for not amputating at the thigh and saving the patient so much pain, and myself so much anxiety. But I was rewarded for my forbearance ; for the following spring he was brought to me, in a condition so healthy and strong, that we could hardly recognise him. The limb remained in the same state, but during the winter several large pieces of sequestrum had come away, and only two fistulæ, about the junction of the upper with the middle third of the tibia remained, from which small pieces of bone occasionally escaped. There was no pain in the joint, and attempts at flexion and extension caused no inconvenience. It is unnecessary to detail particularly the measures adopted to overcome the deformity ; they consisted in the application of variously constructed splints and apparatuses, the changing of which, from time to time, was required by the varying condition of the limb.

One important element in the treatment was to abolish, first the use of the crutch, then of the cane, and finally to make the patient walk about leaning on the arm of another person, then of the hand only; and lastly, to go without any assistance, objects to which he could cling being placed at certain intervals, in the event of the limb yielding. In fact, we should here imitate the infant's method of gaining confidence when first beginning to walk, and make our patients go through the same process.

CASE V.—*Anchylosis of Right Knee. Extension; great improvement.*

The following case, that of the daughter of a medical man, was under the care of Dr. W. P. Smith, who watched it with the greatest interest for years. He has been kind enough to furnish me with the following notes:—

“In the year 1846, — aged six years, whilst walking, slipped her foot and fell, striking the right knee against the curb-stone of the pathway. A slight abrasion was all that could be noticed at the time, nor was any attention attracted to the condition of the joint till five months after the accident, when walking out with her parents it was remarked that she dragged the right leg after her; and, on examination, the knee-joint was found painful and swollen. Medical aid was immediately called in; leeches were applied, followed by fomentations and counter-irritants; but no improvement in the condition of the joint was the result. The joint soon became stiff and swollen, the knee contracted, and the muscles of the thigh and leg became so emaciated, that nothing but bone and skin seemed to remain. About a year after the disease was noticed, Dr. — was consulted, who recommended that the joint should be put upon Scott's plan, with adhesive plaster; which was accordingly done, and the limb was retained in a fixed position for the next seven years; the patient all this time going about upon crutches, with the knee bent at a right angle, and apparently an immovable condition of the joint existing. As this helpless condition of the patient was a source of much pain and anxiety to her relatives, Dr. — and Dr. — were called into consultation, and stated as their opinion, that as no motion existed in the joint, and as anchylosis had taken place in such an unfavorable position, that amputation about the knee was the only plan they could suggest. To this Dr. Smith and the patient's friends objected. It is worthy of remark, that from the support given to the joint, the patient gained confidence, and, though supported by her crutches, allowed the toe to touch the ground; but to do so, it was necessary to bend the body to such a degree that her parents could not bear to see her make the

effort. A year ago Dr. MacDonnell was consulted. The joint was then in nearly the same condition it had been in for eight years, except that the patella was more thrown to the outside of the articulation. On examination he found the joint in such a condition as to lead him to hold out hopes of improvement from mechanical treatment. He advised Scott's plan to be discontinued, and an instrument, for which he gave the design, to be adjusted, and gradual extension by means of it, to be kept up. *In six weeks from the time Dr. MacDonnell saw this patient, the leg was completely straightened, and she could put the foot to the ground and walk about with scarcely a perceptible halt.* Three months after, she could go to a daily school, and now can walk a distance of two or three miles without the slightest fatigue. Indeed, she has suffered no inconvenience from the treatment whatever; and so little annoyance has the wearing of the instrument caused, that she keeps it applied at night as well as by day. She is now tall and well proportioned, and the halt is scarcely noticeable."

This young lady passes my house every morning on her way to school. Need I say that I take more pleasure in seeing her walk upon a useful limb, which has been rescued from the catlin, than I could have derived from the performance of the most difficult operation in Surgery.

CASE VI.—*Anchylosis of Right Knee-Joint in the straight position.—
Forcible Flexion; Cure.*

A strong, muscular young man, came to consult me from the United States, June 16, 1853. Two years before he had fallen upon a scythe, and inflicted a wound through the lower third of the patella into the cavity of the right knee-joint. He was treated very actively for the arthritis that ensued, and after much trouble his medical attendant succeeded in saving the limb, and restoring him to health; but he was not able to follow his usual occupation, viz., that of farming, in consequence of the fixed condition of the leg in a perfectly straight position. I advised him to enter the private wards of St. Patrick's Hospital, and having carefully examined the joint, I found that a little motion could be communicated to the leg, which day by day was increased until the limb could be made to describe an arc of about fifteen degrees. Having practised this gradual flexion for some days, the limb was completely flexed in the following manner:—The patient was placed upon a table, beyond the edge of which the leg extended; and chloroform having been administered, and the thigh held down firmly, gradual flexion was made, until the leg was bent to a much greater extent than on any previous occasion. During these manœuvres, as on the previous occasions,

loud snapping and cracking sounds were heard, from the breaking up of the morbid adhesions. The thigh being firmly fixed, the leg was bent backwards and downwards, by a powerful and sudden effort, so as to bring it to an angle of 60 degrees with the thigh, and this flexion was accompanied by such a loud noise that some of the bystanders, though they had previously assisted me, were amazed at its intensity. The patient was carried to bed, an anodyne was administered, and the knee bandaged with a wet roller; tartar emetic was administered, and cold water kept applied day and night to the joint. This man recovered from the operation without a single bad symptom, and was walking about in a week, and left the hospital at the end of a fortnight from the date of the operation.

CASE VII.—*Anchylosis of the right elbow joint—Extension—Great improvement.*

M. M. aged 16, a native of Burlington, U. S., was admitted into St. Patrick's Hospital, under my care, August, 1852. Three years ago last winter she fell down a sloping piece of ground, the right elbow striking the ground. She suffered no pain until the next morning, when she remarked that the skin was abraded, and that the joint was swollen, and that the arm could not be straightened, and remained painful. Though the arm was not extended for the next three years, she had gained such power over the limb that she could earn her livelihood, but she was subject to frequent returns of pain and swelling, and the contraction had gone on to such a degree that the forearm was bent upon the arm at an acute angle, but by extension with the hand it could be brought to a right angle. Slight pronation and supination could be given to the hand; the muscles on the outer side of the arm were thrown more in front than in the healthy arm, when the latter was flexed to the same extent. The prominences of the inner and outer condyle, and of the olecranon retained their normal relations. There was no bony eminence or tendinous projection in front of the joint. There was considerable wasting of the arm and forearm, a difference existing of one inch at all parts between the diseased and the healthy limb.

I had an instrument constructed by which gradual extension of the arm was produced. The extension had to be suspended at different times, owing to the return of pain and swelling of the joint, but these symptoms usually disappeared upon the application of a wet roller firmly placed around the joint. In the subsequent treatment I applied this fact to great utility, for I kept the joint con-

stantly surrounded with a wet bandage. The extension was carried to such a point that at the end of two months the arm was almost straight, supination and pronation, and a considerable degree of flexion could be performed, and she had recovered so much use of the limb, that she was able to take the situation of housemaid in a gentleman's family, and has since been living in a family as cook and housemaid. The muscles of the arm and forearm have become well developed, and are strong and firm, and she suffers scarcely any inconvenience. Whilst under my care I made her use the arm freely in sweeping and dusting the wards, and in sewing, so that when she left the hospital the limb had been accustomed to the sort of work by which she was to earn her livelihood. I may mention, *en passant*, that this young woman, a short time after leaving the hospital, called upon me to know if I would approve of her submitting to *excision of the elbow joint*, which a surgeon, anxious to flesh his maiden catlin, had kindly offered to do for nothing.

CASE VIII.—*Anchylosis of the right ankle, Pes Equinus—Cure.*

A healthy young man was sent to me, July 22, 1852, by a surgeon in Quebec, under the following circumstances:—He had been engaged in the timber trade four years before, when he received a severe wrench of the right ankle-joint, which was followed by inflammation, supperation and anchylosis. The foot was extended upon the leg, the tendo-achillia standing strongly in relief, and the heel so drawn up that the toes only touched the ground. The able surgeon who sent him to me had proposed dividing the tendon, and putting on an apparatus as in club-foot, but the private affairs of the patient called him to Montreal, and he was from this circumstance placed under my care. When I first saw him I had little idea that it was for an affection of the ankle he wished advice, for he was walking on a coarsely made wooden-leg, which was applied outside his trowsers, and the leg and foot projected behind. There was a good deal of tenderness around the joint, and two sinuses, one at each side of the joint, extended backwards under the tendo-achillia, from which a thin whey-like matter could be squeezed. I could not detect any communication with the articulating surfaces; but the hinge motion of the joint was almost lost. A probe coated with nitrate of silver was passed into the sinuses, and pressure subsequently applied along their course, by means of compresses and starched bandages. In a short time the sinuses healed, and I commenced flexing and extending the foot by simple appliances, the patient being made to leave off the use of the wooden leg which he had worn for nearly three years and a half; at first

he found it very difficult to move about without it, but before one month he could walk about the grounds of the hospital (into a private ward of which he had entered) without any inconvenience, and at the end of two months he returned home, able to walk well upon the foot, with the heel to the ground. It was not found necessary to divide the tendon,—the gradual extension of the foot was effected by means of an apparatus made upon the principle of those usually employed for club-foot; but I attach as much importance to his having been *forced to walk, and to bring down the foot by muscular action* as to the mechanical contrivance, for I am well satisfied that Professor Syme does not over-estimate the utility of dispensing with much of the machinery with which orthopædic practitioners have surrounded this branch of surgery, and I hold it to be true, that if *discased* muscular action can produce many of the mal-positions of the articulating bones (of which I have given some examples above) that restored healthy action, will, in a great many cases, rectify these mal positions if properly guided and educated by treatment. In illustration of this last position, I may briefly detail the following case:—

A young girl, aged 12, had the right ankle sprained,—suppuration around the inner malleolus ensued, which ended in abscess and discharge. A month after the opening of the abscess, it was noticed that the inner side of the foot was drawn up, and that she walked upon the outside of the foot, and I was consulted at this stage, and was surprised to find that in spite of treatment directed to prevent further deformity, the case went on into one of confirmed varus. Assisted by my colleagues, Drs. Howard and David, I divided the tendons of the tibialis anticus, and tibialis posticus, and part of the inner edge of plantar fascia. A wet bandage was applied, and the patient allowed to go about the wards, no mechanical appliance whatever was used, and yet in less than a fortnight we could not tell which foot had been operated upon, so complete was the removal of the deformity. This, I admit, was an uncommon case, but it shows clearly that we should not attribute too much of the success of treatment to the mechanical means employed.

CASE IX.—*Anchylosis of the Wrist Joint. Flexion, Cure.*

Of this variety of the disease I have treated several examples. The following case will illustrate my views sufficiently well. A gentleman, aged 23, received an injury of the left wrist joint which ended in suppuration and anchylosis.—He consulted me in June 8th, 1848. On examination I found that a slight amount of motion could be communicated to the joint, and accordingly, commenced treating it by daily flexion with supination and pronation of the hand. The muscles of the arm and forearm were much emaciated and the loss of power of the limb caused him much anxiety. The treatment consisted also in the

application of Electro-Magnetism, by which the muscular functions of the extremity were called into action, and so soon as by flexion I could communicate nearly all the motions to the joint, I urged him to commence boating, as I had found that the exercise of rowing was well adapted to restore the wrist joint to its former functions. Under this treatment he has regained perfect use of the hand and arm.

The following case at present under my care, is a good illustration of the serious consequences that may follow a very simple operation, if the after treatment of the case be neglected.

CASE X.—*Anchyl^osis of the right Wrist Joint, following the Puncture of a Ganglion.*

A. C. aged 33, a farmer, had a ganglion on the back of the right wrist joint for six years, which becoming more troublesome, he consulted a surgeon on the 4th of March last, who punctured it and let out a large quantity of jelly-like substance—no dressing was put upon the hand and the wound was left exposed, and he says he was told he might use the hand as he pleased. He drove into Montreal the same day, a distance of eighteen miles, the hand being protected merely by his gauntlet. The same evening his wrist became swollen and painful and the swelling soon extended up the arm. The tumefaction advanced as high as the shoulder, and he was obliged to keep his bed for one month. At this moment the motions of the joint are all lost, but such a degree of motion can be communicated to it, so as to satisfy me that a good deal of improvement may be expected from treatment. The arm and hand can be slightly supinated, but are incapable of pronation. The fingers are stiff and slightly flexed, but enjoy a certain amount of mobility. The arm and forearm are much wasted, being one inch and a quarter less than the left arm and forearm, which, considering that he is right handed, is a great amount of emaciation. He has not any pain in the joint, and imparting motion to it, does not cause any suffering.

I had purposed detailing some cases of anchyl^osis of the jaw and shoulder; but as this article has already extended to a greater length than I intended, they must be omitted.

The reader will perceive that I have selected those cases which hitherto were considered irremediable, or that were left to nature; the patient being considered very fortunate in having escaped dissolution whilst the much desired anchyl^osis was being established, and who was not unfrequently reproached for retaining a useless limb, rather than

undergo amputation, and supplying the deficiency by an artificial one. Now, I hold that the *limb which can be made to perform any of its functions, is to be preferred to an artificial one*; and, no matter how well adapted these latter may be to the wants of the patient, they are but poor substitutes for the natural member, though many of its uses may be limited or completely lost. It would seem almost unnecessary to discuss this question, were it not that a marked variance of opinion seems at present to occupy the minds of surgeons in Europe upon the propriety of saving limbs in which the knee-joint is implicated; and whilst the medical press of London, Edinburgh and Dublin contains arguments for and against the propriety of excising the knee-joint, with a view to saving the limb and the life of the patient, both parties appear to have forgotten that a more enlightened pathology, a more devoted therapeutics, both general and local, and a less anxiety to handle the knife and saw, might have attained the objects for which they are disputing.* For it cannot, for a moment, be contended that amputation of the thigh, with a "Palmer's Artificial Leg" in prospect, or a shortened leg and an immovable knee-joint, are to be preferred to an ankylosed joint, to which motion and flexibility are restored. That the cases are rare in which amputation of the thigh or even excision of the joint, are called for, is proved by the rare necessity for the former operation now, compared with the frequency with which it was performed some years ago; and I believe I can appeal to the experience of surgeons who have had much to do with this branch of surgery either in hospital or private practice, in support of the assertion that they now save a great proportion of those limbs which some years ago would have been amputated; and it is to be hoped that as our knowledge of the great restorative powers of nature, guided and corrected by sound principles of pathology and therapeutics, become better understood by the profession and by the public, that limbs considered hopelessly lost will be saved, and that contractions and deformities supposed incurable, will be so remedied and removed that many who are even at this moment carrying about what they consider useless limbs may yet enjoy the performance, if not of all, at least of a portion, of their natural functions.

If it should appear to some of my readers that I have over-rated the great disposition evinced by some surgeons, and these not obscure nor

* The profession is under great obligations to my friend Mr. Butcher, Surgeon to Mercer's Hospital, Dublin, for his able and elaborate article on "Excisions of the Knee-Joint." It contains all that can be urged in support of the operation.

inexperienced, to resort to excision of the knee-joint in cases which might have been saved by a little more management, and a little more patience and reliance on nature's powers, I may cite a few particulars from the two last numbers of the "*Lancet*" that have reached Montreal, viz., for June 20th and June 27th, 1857. In the former, it is stated, in the department of "Clinical Records" that Mr. Fergusson performed this operation "upon a little girl with protracted disease of the knee-joint, which had *many features of spontaneous cure* about it, but, after waiting for some time, ended in disappointment. She was in the hospital last winter with a contracted leg, and straightening of the limb was accomplished, but extreme tenderness remained in the knee." At the examination of the joint, it is stated that, "all the articular surfaces were gone, *with commencing fibrous but not osseous anchylosis.*" No mention is made of pus or other products of active inflammation, and there can be but little doubt that the operation might have been dispensed with; for surely tenderness, even if its amount has not been exaggerated, was not a sufficient reason for performing so serious an operation. At the same hospital, and on the same day, Mr. Partridge operated upon "a lad who had inflammation of the knee-joint over and over again, resulting in contraction, which he a few days previous in vain attempted, under chloroform, to straighten, and to reduce a displaced patella." It is stated "the cartilages were found destroyed," but there were no signs of active inflammation; and it does not appear that, in either case, were there any constitutional symptoms calling for an operation of such magnitude. *

* As a contrast to the above, it is pleasing to quote from the same record the following case, with its expressive heading:—

"A KNEE-JOINT SAVED."

"A little boy was shown us on the 9th June, at the Westminster Hospital, who had been an inmate for fourteen months under Mr. Holt's care, with disease of his left knee-joint, which seemed to be of a strumous character. It went through all the phases of disease witnessed in that articulation. The patella was in a necrosed state, the joint was filled with pus, and the little fellow was as bad as he could be. Mr. Holt made a crucial incision over the patella, and removed all the diseased part of the bone, and at the same time let out a quantity of matter from the articulation itself, the boy's general health being carefully attended to by good diet, &c. The result has been the healing up of the wound, and actual recovery of the boy, with a useful limb. The joint became firm, somewhat flexed, and without pain. As there was some motion in it, a splint was applied with a screw at its under surface, and extension gradually practised, so that there is now some slight motion, with a prospect of straightening the limb, which we have no doubt will prove a useful one as the boy grows bigger. There can be no question that the result here is likely to be more favorable than if excision had been performed."

But it appears that these operations are now undertaken not only where they are uncalled for, but also in cases where no permanent advantage to the patient is to be anticipated, and no end gained but the *clat* of operator, for in the same number of the *Lancet* we have the particulars of a case of "Excision of the Hip-Joint," by Mr. Hancock, where it is stated that "the boy seemed very delicate and pale, and worn out from hectic fever. We learned that he had tubercles in the lungs also." Let it be remembered that the operator is not an ignorant practitioner, whose overlooking the existence of tubercles of the lungs, however unfortunate, could hardly be blamed, but a Metropolitan Hospital Surgeon, whose writings have obtained for him a very extensive reputation, and who must have known the inutility of the operation. I am quite sure that no surgeon in this Province would undertake the performance of such an operation, under circumstances so decidedly contrary to all the rules which regulate operative surgery.

In the foregoing observations I have confined myself solely to those cases of stiff-joint that have followed acute and suppurative inflammation of the articulations; I have not alluded to those examples of the disease that depend upon acute rheumatism, hysteria or nervous affections, of which I have treated several, and have kept accurate records.* My object has been to show my brother practitioners, the necessity of abstaining, if possible, from amputation or excision of the joint, if they have any chance of procuring ankylosis which, in most cases, will admit still further remedy by well applied mechanical means; and secondly, to prove to them that such cases can be treated by the general surgeon, and should not be abandoned, for I hope I have proved the fallacy of the assertion of BONNET that—"La médecine opératoire na rien à faire dans le traitement des ankyloses."

ART. VII.—*Strychnia*. Being extracts from the *Materia Medica* Prize-Essay, of the Session 1856-57, McGill College. By Mr. ALEXANDER REID, London, C. W.

(Continued from page 67.)

If the Iodine test before mentioned be added to a solution of bichromate of Potass and Sulphuric Acid, after a little time a greenish black precipitate falls, which when the mixture is boiled, becomes red, gives off Iodine, and finally a transparent light red solution remains.

* Whilst correcting the proofs of this paper a patient entered my Study, who came from a town in Lower Canada, to place herself under my care for ankylosis of the left shoulder and left wrist joints, the result of arthritis.

If (in the manner fully discussed) the acid Bichromate solution be added to Strychnia, and after the usual reddening it causes be produced, the Iodine test be then added a dense brownish red precipitate falls immediately; if the mixture be boiled, Iodine fumes are given off and a red-lish precipitate still remains after the heat has been continued for some time. This is the Strychnia which has combined with the Iodine, and may be easily proved to be that precipitate by treating with Sulphuric Acid and Binoxide of Manganese. The principle fallacy which this plan of testing labours under, is (as before alluded to) that it will become bleached even if Strychnia be present, and if many other extraneous substances are present also.

The principle one is, however, Alcohol. If even a very small quantity of this substance be present in the Bichromate solution, the latter will be bleached, even if a proportionately large quantity of Strychnia be present. This, no doubt, is a very great fault, but we must be particular if, in preparing the compound containing Strychnia we have used Alcohol, and before we subject it to the test, all that solvent should be driven off by evaporation. I may here state that in any mixture of the Bichromate that has been decolorized, either through the agency of Alcohol or any other incompatible, that the Iodine test will recognize the Strychnia, if any be present in it, and that this alkaloid may be obtained from it by boiling the solution to drive off the excess of Iodine and then collecting the precipitate which will remain, and ascertain its composition by the means previously alluded to.

DELICACY OF TESTS.—With the Iodine test I can detect easily a solution in water which contains only one grain dissolved in four pints or one part in 32,000, but by comparing the action of the Iodine test on water simply, and then on a solution of the strength of one grain to a gallon, or the 128th part of a grain in an ounce of water, you can easily distinguish between the two. Because in the first as it is merely a dilute Ioduretted solution of Potassium which is quite transparent, Iodine being soluble in Iodide of Potassium; but when there is only a very minute quantity of Strychnia present, the Iodine unites with it and forms the insoluble compound which is distinctive, and this when in such small quantity does not fall down but remains suspended in the water causing it to appear a little turned.

I shall not say for a certainty that I was correct, but as near as I can judge I obtained the 128th part of a grain. I divided a half grain twice, thus getting an eighth, and this being dissolved, I took that part of the solution which contained the 128th part of a grain and added it to an ounce of fluid.

If we now assume an ounce of water to weigh five hundred grains, one part of Strychnia can be detected in 64,000 of water. I know that an ounce should contain only 480 grains, but it was the fluid ounce that I used and I have no doubt but it contained the 500 grains in full.

With the Bichromate test, I find it very difficult to distinguish any sensible changes of colour if the solution be weaker than one part in 16,000, or one grain in a quart of water, and then it must be composed with a similar solution, acted on in the same way but wanting the alkaloid.

The Bromine test is not nearly so delicate as that of Iodine, only detecting about one part in 16,000; the principle reason, I think of this, is that the colour of the precipitate with this is so much lighter than that with Iodine, that in very dilute mixtures it cannot be seen, the one giving a light orange tint, where the other gives a dark brick red or brown; the latter, as a matter not to be doubted, produces more opacity in mixtures than the former.

The Chlorine test is not at all delicate so to speak when the mixtures are dilute, and when the Iodine test gives a very dark heavy precipitate, the former can scarcely be recognised.

TO EXTRACT STRYCHNIA FROM ORGANIC COMPOUNDS.—By similar testing as in plain liquids, Strychnia can be separated from any organic solution in which it is contained, if it be even present in small quantity. It can then be obtained in its pure alkaloidal state and perfectly colourless if required.

This method, therefore, is of great use, because by it we are not only made sure of the presence of Strychnia by the compound it forms, but we may also examine it in the same state as if it were really pure.

To detect it in organic mixtures, it is requisite first to add the Iodine test to the liquid supposed to contain the Strychnia, then obtain the precipitate and wash it: and second, treat this precipitate with potassa in solution, when all the Iodine is abstracted from it and only Strychnia remains. If the quantities operated on be very minute, the alkaloid, may not at first make its appearance as it is disseminated through the liquid, but after a while flakey gelatinous looking objects form and settle to the bottom. This is to be carefully washed, as an excess of water would dissolve it. I have found in some cases that no precipitate was formed after the addition of liquor potassae for four or five hours, but when collected, it has proved to contain Strychnine.

Chloroform has been recommended greatly as a solvent for Strychnia; and if so, it would be of the greatest utility when manipulating with such small quantities, as this solvent being insoluble in aqueous fluids,

and also of a greater specific gravity would fall down to the bottom of the test tube. When there it would be brought immediately in contact with the alkaloid, and could then exert its solvent powers to the very best advantage. This could be easily drawn off by a pipette after the alkaloid was dissolved, washed with water if thought requisite and then exposed to the air for a short time, when the Chloroform being driven off you get the substance required. The product thus obtained I need hardly say can be proved to be Strychnia by its solubility in diluted acid, great bitterness, reactions, play of colors with Binox, Manganese and Sulphuric Acid, &c.

I have found liquor Potassae to be much superior to Ammonia as an alkali, with which to abstract the Iodine, for two reasons; first, it is less soluble in Potassa than the above mentioned alkali; and, secondly, it abstracts the Iodine much more readily, never wanting heat to assist it which in the other case is generally required.

The wet precipitate is much more easy to manipulate with than the dry, because, I suppose, chemical affinity is greater before all the watery particles are driven off, than it is if first dried and then wetted, as the water is not united with it in the same way. The alkaloid may be likewise obtained from the bleached or reddened Bichromate solution containing it, by obtaining the requisite precipitate in the manner before given, and then acting as just now described with that product.

When Strychnia exists in Organic Solutions, it may be *directly* tested in these if we make allowance for a few peculiar effects which these liquids cause.

For example on the Iodine test. In most of them immediately on its being added the Iodine separates in flakes as if coagulated, and the remainder of the fluid is tinged, not red, but of a violet colour; but upon the addition of Potassa all this is removed, and the mixture becomes transparent. If it be boiled without the addition of Potassa, Iodine is given off and it becomes clear and transparent. Some of these liquids cause precipitates which are very similar to those of the alkaloids, and are not dissolved unless by long continued boiling. They are at once distinguished, however, by being wholly soluble in liquor Potassa, and giving a clear transparent solution from which nothing is deposited upon standing. Also if the collected precipitate be treated with strong Sulphuric acid, &c., nothing as regards a change of colors is produced. With some that contain Gelatine a precipitate is formed which is to a certain extent peculiar, as it so much resembles the genuine; but it can be easily distinguished by heat as before mentioned. The Bichromate test, as before alluded to, is bleached by

most organic liquids, and its action is greatly impeded. The way which naturally presents itself to obviate difficulties of this kind, is to evaporate the liquids and treat the solid product with Alcohol. In this way we would get rid of gelatine, albumen, dextrine, starch, &c., which for the most part hinder the action of the test. The alcoholic solution must be also evaporated as that agent would have as baneful an influence as those we have got rid of: by dissolving this product in water we can apply the test without fear of fallacy.

ACTION OF IODINE ON NUX VOMICA.—To still further show the property Iodine has to combine with Strychnia, in whatever chemical combination the latter may exist. I made a simple decoction of the rasped nuts, but I found that the precipitate formed was not thrown down as it generally is, making only an opalescent mixture, but upon adding a few drops of Sulphuric acid it was immediately thrown down, thus showing that although it did combine with the Strychnia yet it could not alone separate it from the organic compounds; but when the acid was added, it by its superior affinity separated the Igasuric acid, and then the iodine having a greater affinity for the alkaloid than the last mentioned acid, immediately combined with it and was precipitated in the usual way. I proved this precipitate to be Strychnia in combination with Iodine, by the before mentioned process. I have tried the Bichromate test, but it was bleached, and after a while the green oxide of chrome made its appearance. This, I may say, is always the case when the test is decolorized, although it may take a little while to bring out the color of the oxide. From this bleached solution the iodine test throws down the Strychnia as it is wont. I think the reactions with Nux vomica are very distinctive and leave nothing to be wished for. If you make an acid decoction of the nut the subsequent processes are much assisted. If the process here detailed be compared with that at present given in books on the subject, it will appear to be superior in two respects. Firstly: in the ease with which it can be resorted to, and secondly, its applicability when we have to manipulate with very small quantities. This last can be best appreciated when we consider that Strychnia is only present in Nux vomica in proportion of one half per cent., and you would require 200 grains, or between three or four drachms of the powder to yield one grain of alkaloid. This powder has proved poisonous in small quantities, even as few as fifteen grains (Dr. Traill) produced death. There are, no doubt, many cases on record, where larger doses have been given without proving so injurious, but in many of the cases which may be brought before the medical jurist, the quantity taken will not exceed on an average more than thirty grains.

In order to prove that this powder is nux vomica, we must obtain Strychnia from it; and as the manipulations which require to be performed by the customary method (i. e. that described in books) are very difficult and numerous, there is a great probability that the product will escape detection. The customary method is given by Taylor in his work on poisons, as follows: (for details see the work in question). Now instead of all these different steps which would seem to lead inevitably to failure, we may simply by making an infusion and precipitating get the product required. I grant there is room for some loss in both, but much less in the latter than the former.

EXPERIMENTS ON ANIMALS TO PROVE THE TEST.—In order to test practically the truth of the statements given in some of the preceding page, I performed a few experiments on animals; and the result of these, I can say with confidence, has fulfilled my highest expectations. In the first instance I gave this alkaloid in small quantities that it might become absorbed, and then be able to test for it in remote organs; and subsequently I gave a poisonous dose that I might find it in the stomach likewise.

The first one of the series was a chicken to which I gave at first the $\frac{1}{4}$ of a grain, of the Hydrocyanate of Strychnia. In two hours I gave it $\frac{1}{8}$ more, in twenty four hours I gave it $\frac{1}{8}$ and in thirty hours afterwards I gave it an eighth of a grain, of the same salt, but not until it had recovered from the effects of the separate doses. This caused death, and I then made separate acid decoctions of the crop and its contents—the intestines—liver—lungs—brain and spinal chord.

After having filtered the products, I tried all the tests but got no result to rely on. The Bichromate test was bleached, and the Iodine not only combined with the Strychnia but gelatine, so that the mixture was rather complex. Upon addition of liquor Potassae to the portion containing Iodine, all this was abstracted, and the Strychnia became visible as a whitish precipitate. In order to be still more certain of the product I abstracted all the excess of acid, merely leaving a small quantity, because when the water was evaporated it might be charred. The filtered solutions were evaporated gradually until they became thick, ropy, and homogeneous products. I treated them with alcohol separately and boiled them in that solvent. I again drove off the alcohol, and upon then applying my tests, there was no doubt in this case the Bichromate solution gave accustomed reactions, and the Iodine precipitate was proved by Marchand's test to contain strychnia.

It is not requisite to go through this process in order to apply the Iodine test with success, because it will in any mixture combine with

the Strychnia, the only hinderance being that some organic liquids by themselves combining with the Strychnia, render it impossible to distinguish the Strychnia precipitate when thus situated; but as detailed under organic liquids, liquor Potassae removes all and only Strychnia is left, and this can be proved to be that alkaloid by the other corroborative tests.

To return to the mixtures. In the brain and spinal chord mixtures no evidence in the least was obtained by any test. The lungs did not show the least sign of any being there. I evaporated the products to get an extract and then used alcohol, but this was not in reality necessary, and I did it to answer another purpose. I should think from this experiment that Strychnia could be obtained from the liver when you would fail in the other organs to do so; but as this was the only case but one that I gave the Strychnia in such minute quantities, I cannot give much more light on that subject.

The second was a kitten to which I had given $\frac{1}{10}$ of a grain dissolved in Acetic Acid.

I boiled the stomach and its contents, which were bread, meat, coagulated milk, &c., in acidulated water. The filtered product was very thick and mucilaginous, and of a muddy colour.

When the Iodine test was added it behaved in a similar manner to that in the previous case. It appeared at first to have that peculiar reddish white fringe when the test was added, but in such a mixture I would not consider it of any importance. On the addition of liquor Potassae all colour apparently was discharged and you had a transparent liquid, but in a short time a precipitate gradually settled down which was Strychnia, as it proved by the Bichromate test which with this product gave the accustomed reddening of the solution, but when used with the original liquid it was bleached. The intestines gave sufficient evidence of its presence, but with the other two it was different, in being present in greater quantity. That obtained from the crop and liver gave very marked evidence of its being present, and by treating the Iodine precipitate with liquor Potassae I obtained the alkaloidal precipitate, which I tested: first as to taste which was bitter; second—solubility in Acetic Acid; third—Tannic Acid, which threw down a whitish precipitate; and upon this itself being dissolved in Sulphuric acid, the Iodine test gave accustomed reactions. I did not try what effect a salt of gold would have as I did not have any at the time.

But what made assurance doubly sure it gave the reactions with Marchand's (the Manganese and Sulphuric Acid) test. This shows

how delicate it is, for the whole quantity taken amounted to less than the $\frac{1}{4}$ of a grain, and it is most likely that even a portion of it was excreted. From the crop and liver I obtained fully the $\frac{1}{10}$ of a grain, judging from bulk. In the crop, besides what I used for the other tests, when I at first got it there were some grains of wheat and about two table spoonsful of a soft homogeneous mass which was bread in a wet state. The contents of this crop, as any one may see, would give rather a compound mixture with Sulphuric acid present likewise, but the Strychnia precipitate was obtained from this mixture without great trouble.

The third was a kitten to which I had given $\frac{1}{20}$ of a grain, of the double Chloride of Mercury and Strychnia. I do not think there could have been more than the $\frac{1}{20}$.

I treated it as in the other cases, and to a small quantity of the filtered product I added the Iodine test, which became very dark with a reddish tinge. There was a large quantity of precipitate thrown down, which was not all Strychnia, but when liquor Potassæ was added all the superabundant product was abstracted, even the whole of the precipitate disappeared. I added some water to render the mixture more fluid and allow of the product to settle down better when formed.

Nothing appeared to form for some hours, but then a flocculent precipitate gradually fell to the bottom, which proved to be the alkaloid by Marchand's test, and the Bichromate likewise.

The fourth was a kitten which I poisoned with a preparation of the alkaloid that proved fatal in ten minutes after receiving it; but about twelve hours before that I gave it an exceedingly small quantity of the double Chloride of Mercury and Strychnia.

It was the liver of this animal that I examined, and as death came on so soon after receiving the last dose, I think that it had not yet been absorbed sufficiently to be present in the liver. The previous dose caused merely a few spasms, but nothing nearly sufficient to cause death, as the next morning it was apparently quite well.

From about the $\frac{1}{20}$ part of the filtered product I obtained evidence which could hardly be doubted. When the Iodine was added a heavy precipitate fell down as is usual in such organic liquids. Where liquor Potassæ was added everything disappeared. Water was added to render the product more fluid, and in an hour transparent flocculi were seen floating in the mixture, which after an hour more settled down to the bottom gradually. The supernatant liquid was poured off, and it was washed two or three times with water. Marchand's test gave with this a very delicate play of colours, which I think was distinctive, and

which could be easily seen when compared with the reaction of the same test on the fluid which was poured off the precipitate, thus showing also, that it could not be owing to the small quantity of the original mixture which might happen to be adherent to it, although it was examined in a hurried condition. With the Bichromate test and the original liquid, it was as is usual bleached; but when the precipitate was used with the last mentioned test, a distinctive though yet delicate, reddening was the result.

From these experiments I naturally conclude that Strychnia can be detected even in exceedingly minute quantities, either free or mixed up with other liquids, or even combined with the animal principles, which have prevented the London professor from proving its presence.

I think also that Strychnia can be detected a long time after death, as it is not decomposed at common temperatures, and this fact proves its stability, viz. that it has been found in the urine in a perfect state. What also leads me to this opinion is that in the first case mentioned, two weeks elapsed after the death of the animal before the poison was detected, and it was subjected to long continued evaporations in solution, &c., and it remained intact.

PHYSIOLOGICAL EFFECTS.—(These are discussed, as observed first in vegetables, second in animals, and third in man. The originality of the author is chiefly evident under the second head, when he says:) Strychnia is also poisonous to all classes of animals. Its effects on the vertebrata are very uniform, although herbivorous animals are not so much effected as the carnivorous, being in this respect similar to Belladonna and Stramonium, thus one half of a grain will kill a dog in a few minutes, but a much larger than a proportionate quantity would be required to kill a horse. The bird called the Buceros Rhinoceros is said to eat the Strychnos Nuts with impunity.

I gave a kitten about $\frac{1}{7}$ of a grain, as a powder placed on the tongue; for about eighteen minutes it walked about apparently unconcerned but then spasmodic contractions of the limbs commenced. The legs were set out as if to prevent it from falling. The whole body became rigid, and respiration was rendered impossible by contraction of the muscles of the chest. This lasted for nearly two minutes when it again breathed freely and the muscles became quite flaccid. It continued in this manner for eight or ten minutes, when it died apparently from spasmodic contractions of the thoracic muscles impeding respiration. After death it was quite flaccid and moveable.

I placed a quantity rather less than the $\frac{1}{15}$ of a grain underneath the skin of the foreleg in a kitten of the same age.

It was not seized with spasms for about ten minutes, when the contractions of the muscles appeared to be even more vigorous than when the poison was taken by the mouth. Death came on sooner also in this than the previous case, although the symptoms were similar in each. The body was also flaccid and moveable.

About $\frac{1}{16}$ of a grain placed on a piece of toast was given to a pigeon, which was eaten. It flew away unaffected after eating it. In fifteen minutes it came back again and took about $\frac{1}{4}$ of a grain more, after which it stayed picking about. In four or five minutes its gait became irregular, and it acted as though its legs were tied and had no power of bending them. This irregularity increased in some degree, but it flew away as readily as ever. However, just as it was reaching the top of a house it fell down as if shot. After a while it again flew about twenty feet and fell. The spasmodic contractions did not come on very often, nor were they violent, the wings and legs would sometimes be stretched out. Finally the head was bent over directly on the back, and the tail depressed. The head gradually came back again and rested with the beak on the ground, the eyes closed and it died. It appeared to have great difficulty of breathing; after death it was quite flaccid. I suppose the reason it required so much of the alkaloid to kill it was, because it is similar to herbivorous animals in this respect.

Strychnia is a local irritant as I proved from the following experiment. I put the $\frac{1}{8}$ of a grain underneath the skin on the inner side of the thigh: and in order that it might not result from the wound made I merely pierced the skin sufficiently to allow the introduction of the point of the lancet. After putting in the Strychnia I moved the skin over the muscle underneath, and thus brought it in contact with a very large surface (comparatively speaking). By this means the muscle was not so much injured by the knife, and the contact of air was also prevented.

When the animal was killed, in a few days afterwards upon examination, I found a large spot inflamed, but principally in places where the alkaloid was brought in contact with the muscle, some spots here and there not showing as much inflammatory action as others. I have no doubt but it would prove irritant to the stomach, but in no case in the animals upon which I experimented, did I find a trace, as the mucous membranes were not in the least red; but it is not always, perhaps only seldom present.

(To be continued.)

ART. VIII. — *Remarks on Hospital Gangrene, from observations made during the late War.* By Assistant Staff Surgeon Dr. Woods.

This disease, for the first time, made its appearance in the wounds of those who had suffered at the battles of Alma and Inkermann, in the beginning of the month of December, 1854. A very few cases may have occurred in the latter end of November of the same year. At this time the hospitals were filled not only with wounded, but also with men suffering from fevers of a typhoid character, varying from low common continued fever to the worst forms of typhus, partaking frequently of the gastro enteric-character. During the summer and prior to the arrival of the first batch of wounded after the battle of the Alma, typhus fever had been prevalent, cholera also with dysentery and diarrhoea were frequent. When the disease of which I now write first presented itself in the large general hospital, this building although very well filled with patients was clean. Every endeavour was made to procure thorough ventilation for which the plan of the building and its appliances were well arranged, and deodorizing agents were extensively used. The atmosphere which is known to possess such an influence over the disease, was at the period of its primary outbreak much colder than it had been at any time since the arrival of the wounded, in fact the accessions of cold weather and hospital gangrene were almost simultaneous; and not only was this the case, but on each occasion of the setting in of cold weather, an increase of the disease was invariably noted with an aggravation of the malady in those already affected. Whether we can account for the effects I have mentioned by the cutting off of the means of ventilation, such as doors, windows, &c., constantly open during the warm, but not so during the cold weather, I am unable to say, but I should think such causes may have had something to do with the production of the increase of the disease. When I first got charge of the hospital gangrene ward, about ten cases were under treatment, by far the majority of whom were suffering from low typhus fever, in addition to the local malady; and most of these fell victims to the combined diseases. From what I saw of the disease, I am convinced its pathological condition is varied, such variations in the condition of the diseased part being accompanied by different species of fever, and requiring each a separate treatment, so that we cannot lay down for ourselves specifics either locally or constitutionally in this disease more than in any other. The following description embraces the different forms which came under my observation.

1st. Cases in which the fever preceded the local manifestations of the disease, at first typhoid in its character, but subsequently degener-

ating into the worst and lowest form of typhus; the constitutional ruling the local malady and most frequently conducting in itself to a fatal result. Diarrhoea almost always present.

2nd. Cases where the local disease first showed itself, the constitutional symptoms succeeding, and sympathetic, the latter mostly sthenic in their character subsiding with the cessation of the spread of gangrene. This class of cases, mostly, though not always, occurred when stumps or extensive surfaces were attacked.

3rd. Cases in which no fever accompanied the degeneration of the healthy action, &c., and where the disease seemed merely local.

4th. Cases where in strong healthy young men constitutional symptoms of a high inflammatory order manifested themselves simultaneously with phagedenic disease showing itself in the wounds from which they suffered, most of which were inflicted by fragments of shells, which injuries I may here remark were of all others, the most prone to take on gangreneous action. In this fourth division antiphlogistic treatment was necessary, and here also venesection was decidedly of service.

With respect to the first class, it was no uncommon occurrence to see a man suffering from a wound become attacked with fever, which from the beginning was of a low type. Shortly after the febrile accession, the aspect of the wound underwent a remarkable change, the granulations disappeared, and in their place a bloody oozing covered the surface of the sore, a thin ichorous discharge small in quantity and of foetid odour issued from the cellular tissue in the interstices of the muscles and from underneath the surrounding integument; soon these parts were dissected by the sloughing away of the cellular tissue, and in a few days the whole surface of the wound looked like charred meat. The form of the wound became almost oval, the interspaces between the muscles being filled with half destroyed cellular tissue, which having become saturated with clotted blood, assumed exactly the same colour as the muscles, whilst discharge of matter of any kind nearly ceased. The surrounding skin was of a dark red appearance, and rarely vesicated. Whilst the local disease was thus running its course, the constitutional symptoms assumed an equally malignant form; so insensible at this period were many of the sufferers, and so lethargic, that the application of strong Nitric Acid did not seem to give them the least pain: the tongue was covered with a thick black dry fur, the pulse small, quick and thready, the surface colder than natural, and subsultus tendinum not unfrequently present. The bowels were affected, the motions being slightly bilious, very fluid, and fre-

quent. When the local disease had proceeded to a certain extent, and the charred appearance alluded to had become established, the action ceased; it seemed as if the powers of life had so far sunk as even to be unable to contribute to morbid action. The skin was rarely perforated when undermined; the sores were oblong in shape and not as usual, circular. Such cases were generally, indeed always fatal in their termination. The application of strong local caustics only seemed to me to make matters worse. Any amount of internal stimulation was well borne, and once or twice by the free use of wine and brandy, I was able so far to improve the patients condition as to hope for a favorable result, but the men soon sunk again into their former hopeless state. The constitution having to contend with two such poisons as gangrene and typhus seemed completely vanquished, and when we add to this, that all the men were middle aged, had seen long service and were a good deal, even previous to the attack, broken down, we can partially account for the unerring fatality of this form of the disease. None of these cases lived long enough to establish the principle of the constitutional disease by its periodically influencing the local, as we see sometimes to occur when typhoid pneumonia complicates typhus fever. The treatment I used was chiefly directed as I have stated to support the powers of life, such as wine, brandy, nourishing broths, &c.—locally I tried the Nitric Acid but finding it of no avail. I afterwards used carrot poultices and such like applications, and under this treatment some of the sores, for a time, over a small part of their surface took on a healthy action, but speedily relapsed. The lower extremities were in all the cases which came under my notice the only part affected.

The second class of cases occurred for the most part in stumps, especially of the upper extremity, or in large surfaces. This is the disease which I believe constitutes the true hospital gangrene; its march is rapid in the extreme, and except a stop is early put to its ravages, an entire extremity must soon be destroyed. The accompanying fever was secondary and sympathetic in its character in every case which came under my observation. The first symptoms usually noticed, were a change of colour in the aspect of the wound, which took on an appearance as of yellow mixed with red. The discharge at the same time changed from healthy pus to sanious ichor, at first rather less in quantity than the amount of pus previously secreted; but after a short period becoming voluminous in quantity. Severe pain in the affected part was complained of, and the patient looked fatigued and restless. The surrounding skin assumed a deep red colour and vesicated. From this point the disease if not checked quickly extended itself. The skin

became everted, and marked with ridges on its upturned surface. The cellular tissue was dissected from underneath, and in the interstices between the muscles, perhaps at this stage a large portion of the extremity or part would suddenly swell, the skin assuming a deep red colour, and in twenty-four hours the whole of this would be one vast slough, the broken down cellular tissue hanging from the part and looking like tow saturated with matter, while the entire surface became of an ashy colour, studded here and there with dark livid spots, hæmorrhage would now occur, though this accident far more frequently occurred in those cases which rather tended to the centre of the limb, and did not spread eccentrically. On one occasion I for a time (thirty-six hours) restrained hæmorrhage from the radial artery, by forming a coagulate with nitrate of silver. In only one case of this kind did I remark any discolouration or flushing of the face said to be pathognomonic of Hospital Gangrene, even in this case it was not so marked as in another form of the disease yet to be described. In one remarkable case where the wound was situated in the upper part of the right arm, the gangrenous process after extending as high as the shoulder, ceased on the anterior and outer part where granulations showed themselves; in the axilla, however, such a favorable issue did not arise from the application of the nitric acid, the gangrene here continuing to spread. I had hoped a second application of this remedy would have had the desired result, when suddenly the whole extremity from the shoulder to the hand became rapidly œdematous, of a dark red colour and vesicated, low irritative fever rapidly set in, and the man died sixteen hours after the first appearance of the tumefaction. I had supposed that the extension of the sloughing process, which I have described, to the lower part of extremity, hitherto unaffected, was caused by inflammation and consequent blocking up by lymph of the axillary artery and vein; the post mortem which I instituted showed, however, that this was not the case, as these vessels were found healthy and patent. It was in fact nothing more or less than an enormous extension of the disease involving by a single leap an entire extremity within its grasp.

In all these cases the amount of suffering was greater than in any other form of the disease. One circumstance deserving of attention, is the rapidity with which granulations are thrown out, and new skin forms, once the slough has been thrown off. No sores, which I have ever seen, heal so rapidly as those left after this form of hospital gangrene. The pulse after the first or second day, according to the extent of the surface attacked, became quick, full, and strong, the tongue foul, and bowels generally constipated. The treatment pursued was as follows:

On the first appearance of the disease, an emetic was administered, followed by a purgative, and the local application of the Nitric Acid to the surface of the sore, and also to the skin surrounding the sore, and this application was repeated until the disease has ceased to extend. One gentleman who has written on this disease, speaks of the inutility of applying the Acid to the surface of the sore, believing the disease to reside altogether in the circumference of the part attacked. I would merely remark in opposition to this view, that we cannot thus account for the extension of the disease down to the bone, or throughout the entire track of musket balls,—in fact no part of the body whatever is capable of resisting the effects of this malignant disease. I have even seen the extension of the gangrene proceed more rapidly and extensively in the centre of a limb where a musket ball had penetrated, than at either extremity of the opening. In the case to which I have alluded as rapidly involving the upper extremity, it must be evident to every one that no local application could be of service. I have often since regretted I did not try venesection as I think it might have done good.

With regard to the result of experiments made with different caustics such as chloride of antimony, &c., in these cases, I believe on the whole the Nitric Acid to be the best, and also less painful than some others. In accordance with a circular memorandum received at a time when the disease was rife, recommending the internal use of the Muriate Tincture of Iron, I tried this remedy, but I feel certain, that no greater success attended our treatment after than before its introduction; this much is certain it exercises no specific effect whatever over the disease. For the hastening the separation of the slough, I found a strong Nitric Acid lotion the best; in some cases a combination of Castor oil with Balsam Capivi, produced good effects.

The third form of the disease requires but brief notice. It occurred in small superficial wounds, for the most part situated on the lower extremity; and which looked when affected by the disease as if their surfaces were covered with a yellowish albuminous substance. Very frequently only a part of the surface of a sore was attacked, but always a portion of its circumference was affected, and here the skin became undermined, and the ulcer at the affected part assumed or tended to assume a circular form. The disease even if left to itself unchecked, progresses slowly, it was nothing more than phagedenic ulceration; no fever accompanied its inroads, and a single application of the Nitric Acid followed by a dressing with Nitric Acid lotion sufficed to stop the diseased action.

The fourth form of the disease, or that which I have described as being accompanied by fever from the beginning, and occurring

in young and strong subjects, belongs to a class, which I believe has not yet been described by any writer on the subject. The few cases of it which I saw occurred in Camp before Sevastopol; during my time at Scutari there were none such. Its distinction is important for many reasons, but for none more than that I believe that such are the cases in which venesection proves the best remedy, and that the application of Nitric Acid previous to blood-letting, or during the early stages of the malady, only tends to aggravate the disorder. The first case of this nature came under my observation in the latter end of April, 1855. The subject was a young man who had gone through the previous portion of the Campaign, and was prior to the reception of his wound in good health, he was of sanguine temperament; short and stout formation, and had so far as I can recollect been no more addicted to drinking habits than the generality of soldiers. He was wounded in the trenches by several splinters of shell, one of which cut through the margin of the muscles forming the posterior boundary of the axilla; a second splinter wounded him midway between the axilla and the lower border of the false ribs, and a third piece struck him on the back of the left or same side on which all these injuries had been inflicted; none of the wounds were at all deep or large, and no danger whatever was apprehended. The injuries in a few days assumed a healthy appearance and were covered with granulations, when one morning he complained that he had passed a sleepless night, and that his wounds and the side on which they were situated, were very painful. On examining the part, the granulations were found to have all disappeared, and the surface of the sores to have assumed a dry yellowish glazed appearance. The skin around was puffy, vesicated, and of a dark shining red colour; from underneath the margins of the ulcers, where the cellular tissue was in part assuming a sloughy appearance, came an ichorous discharge small in quantity, and irritating in quality. His pulse was quick and strong, his tongue foul, and bowels confined, but what I particularly noticed was the dark red hue of his face. I made a careful examination of his chest, with the stethoscope, dreading that pneumonia might have supervened, but could discover no signs of thoracic disease. I at once gave him an emetic, followed, after its action had ceased, by purgatives, and applied the Nitric Acid around the margins of the wounds.

Notwithstanding this treatment the disease continued rapidly to spread, and the constitutional symptoms more than kept pace with the local spread of the affection. Twelve or fourteen hours after the first appearance of the disease he was delirious, and in a state of lethargy, which the pain of his wounds alone prevented from being continuous

He died thirty-six hours after the first appearance of the gangrene, the entire side having become swollen, red, œdematous and vesicated.

A post mortem examination revealed nothing in the state of the viscera to account for death.

I must confess I was not a little surprised by the sudden and fatal termination of this case for which I was totally unprepared. I regretted when too late, that I had not bled him, and I determined if ever such a case, or one approaching to it in similarity of symptoms, again came under my notice, I would give the remedy a trial, and with what results the next case will show. The application of the mineral acid gave him intense and *long continued* pain increasing the local irritation. There was nothing to account for the origin of the gangrenous action in the state of the atmosphere of the ward, as the latter had just been erected and he was the first patient who had been placed in it.

Case 2nd. A young, and previously healthy soldier was carried in from the trenches to the field hospital, in the early part of the month of July, 1855, at which period many of the wounded were suffering severely from hospital gangrene. The man had been struck by a large fragment of shell over the region of the right kidney; integument to a considerable extent, together with part of the *latissimus dorsi* muscle having been carried away by the missile. Scarcely any hæmorrhage resulted, but the man when he reached the hospital was almost pulseless from the violence of the shock sustained. About an hour after admission, he passed a quantity of urine largely mixed with blood. From the depth and appearance of the wound, it was much feared, the kidneys had been touched by the missile, and thereby injured, but after events proved that such could not have been the case; however, no one who saw the case soon after admission looked for a recovery, as it was supposed the degree of subsequent sloughing necessary to the throwing off of the disintegrated part, must inevitably lay open the cavity of the peritoneum, or at least induce inflammation of the membrane which would with other causes carry off the sufferer. Poultices were applied and a large amount of slough separated without any unfavorable symptoms other than the continual presence of hæmaturia and considerable debility, but the wound itself on the ninth day was covered with healthy granulations, and secreted sound pus. On the morning of the eleventh day after the receipt of the injury, a remarkable change was found to have taken place, the previously granulating surface had assumed a dry curdy yellowish appearance, and from its margin alone secreted a fœtid sanious discharge with the surrounding edges and integument highly inflamed and vesicated. The

man's face was of a dark red colour, his tongue covered with a thick yellow fur, his pulse quick but not very strong. On the twelfth day the surface of the wound was covered with a greyish slough and its margins undermined, yet be it remarked the discharge was much less than was commonly the case in other forms of gangrene; in this respect, indeed, presenting quite a contrast, as the quantity secreted was much less than even might be expected from a healthy sore of the same size. Nitric acid was applied but did not stop the extension of the disease, and taking into account the highly congested appearance of the patient, with the comparatively small amount of the discharge notwithstanding his debilitated condition, venesection was deemed the only remedy which afforded a chance of saving life. This operation was accordingly performed and six ounces of blood taken away when syncope threatened. The best results succeeded. The burning pain was in a short time relieved, and the red and congested aspect disappeared. Soon after the loss of blood, the extension of the gangrenous process ceased, and the slough separated under the use of the nitric acid lotion, the wound again assuming a healthy aspect. The man was finally sent to Scutari for further treatment, still passing bloody urine, but with a much diminished quantity of the former ingredient. It may be argued that the small quantity of blood taken away could have produced little effect, but when we take into account the debilitated condition of the patient, caused by the previous separation of a large slough together with the extensive suppuration, we must form a different opinion; besides the marked and speedy benefit which resulted affords the best proof of the benefit conferred by venesection. The dry yellowish appearance of the affected part in the primary stage, the excessive violence of the constitutional symptoms with the dark red congested aspect of the face, is sufficient to distinguish this form of gangrene from any of the preceding classes.

ART. IX.—*New views on the Physiology of the Large Intestine.* By
M. F. COLBY, M.A. M.D., &c., Stanstead, C. E.

It is now more than eighteen months since I discovered the error in the received physiology of the function of the large intestine, particularly in that part of it called descending Colon, Sigmoid flexure and rectum. Every day's observation since has confirmed me in the correctness of my views. Although I have not been able to engage in

general practice, I have had numerous opportunities of testing them as to their bearing on pathology. The knowledge of the true function of the descending bowel does away with all the uncertainty complained of by medical men as to the effect of cathartics, and more particularly of enemata, in many cases. A discussion took place in the Westminster Medical Society in 1833, which is reported in the London *Lancet*. The discussion developed one fact, that there was a consciousness among all present that there was something not satisfactory in the received physiology; which led of the question to the anatomists present, whether there was anything in the anatomical structure of the descending bowel which could operate as a valve?

I can demonstrate the received physiology of the function of the descending bowel to be untenable, and that it implies the charge that the Creator has left a defect in the organization of a particular part, which renders it inadequate to the performance of the function assigned it. My new physiological doctrine recognizes two distinct apparatuses, each possessing peculiar and distinct functions over and above what is recognized by the old system. These functions were supposed to pertain to that apparatus called the large intestine, and heretofore assigned to the function of organic life, assisted by the voluntary co-operation of the abdominal muscles.

As to the purport of my new physiological doctrine, I quote from lectures which I am preparing illustrative of the subject, the following recapitulation:—

1st. I assume that the organic function of the colon ceases at its left transverse extremity.

2nd. That the portion called descending colon and sigmoid flexure has a separate and independent function.

3rd. That this portion of the bowel is anatomically inadequate to the performance of the function heretofore assigned it.

4th. That this portion constitutes the link between the animal and the organic life. That it is possessed of both animal sensibility and contractility to such an extent as to entitle its functions to be considered those of animal life.

5th. That although it is to a certain extent subject to the will, and can be brought into action at any moment by it, yet it has an independent instinctive life which gives it an influence and a power which neither its organic or its animal life could give it.

6th. I assume the name of *curator* as proper to express its function; and as it is a dualite acting under its instinctive life, at times in a separate capacity, I give the name *curator superior* to that portion above the

superior spinous process of the ileum, and which for the time is devoted to the functions of organic life; and *curator inferior* to the portion below, usually called sigmoid flexure—this for the time being devoted to the functions of animal life.

7th. That the *curator*, when acting as a unit, occupies the post of observation between the two lives. That it takes cognizance of the time when the digestion and the nutritive absorption is completed in the small intestine; that it then opens the ileo-colic valve, and at the same time by a suctive and expansive action it takes the fecal matter from the transverse colon and conveys it to the rectum, which it aids the levator ani muscles to raise, and by a divergent action of its two longitudinal muscles it opens to receive the same. The *curator*, by its instinctive power, recognises the fitness of the rectum to receive and expel the fecal matter simultaneous to the opening of the ileo-colic valve; it also at the same time brings into action the abdominal muscles, by which the contents of the small intestine are pressed forward to supply the place of the refuse matter removed from the colon. Its office is therefore not only prehensile in taking the fecal matter from the transverse colon and conveying it to the rectum; but it exercises the conservative function of keeping the ileo-colic valve closed till such a time as the absorption of all nutritive matter from the contents of the small intestine renders its closure no longer necessary.

8th. That the rectum is part of an apparatus which I call rectal, and which is wholly under the domain of the will; that it exercises the function of defecation, and aids in that of urination and parturition. In its anatomical structure it is analagous to that of the upper part of the digestive tube with the difference of the reversion of the sphincters. It consists of the strongest muscular portion of the bowel; the rectum, with its muscles; the two sphincters, the levator ani, the coccygei, &c. The same looseness of the cellular tissue, which connects the mucous with the muscular coat of the œsophagus, is found between these coats of the rectum.

9th. That the power of the will extends over that part of the digestive tube which extends from the mouth to within two or three inches of the cardiac orifice of the stomach; so also the power of the will extends from the external sphincter ani to within two or three inches of the left transverse extremity of the colon.

10th. That the rectum, in that abnormal state which results from phlogosis of its muscular coat, has its contractility exalted so as to cause it to act antagonistically to the *curator*. This is the most frequent cause of constipation and its consequence. When this contractility becomes

spasmodic this resistance leaves the *curator* to mechanical forces—hence results accumulations and distention of its weakened side walls. It is this abnormal state of the most sensitive part of the digestive tube which fills the hospitals with the insane. It is also in this state that the *curator*, by its instinctive life, acts as a dualite by a peculiar transposition which gives it a great power in overcoming the resistance of the rectum.

11th. The ileo-colic valve may have its function suspended by local disease, as well as by peritoneal inflammation; but the most frequent cause is the suspension of the function of the *curator*, which may arise from antagonism from the abnormal state of the rectum, or from a phlogosed state of its own mucous membrane. A sudden closure of the valve would cause tympanites, ileus or strangulated hernia. A weakened or too active state of the valve would result in emaciation from the premature passing of the nutritive matter.

CLINICAL LECTURE.

Use of the Starched Bandage in some complicated Cases of Fracture.

By JOHN HAMILTON, Surgeon to the Richmond Hospital, Dublin.

(*Dublin Hospital Gazette.*)

Some years since when the starched bandage was first introduced in the treatment of fractures in Belgium and France, it was tried by many surgeons in this country, but quickly abandoned; and considering the way it was generally applied, this cannot be wondered at. A calico bandage, dipped in starch was wound round the limb, and expected when dry to form a splint, exactly moulded to the part, and so it did. But in drying it also contracted, and exercised considerable compression on the soft parts, particularly injurious when those were situated over bony prominences, as the lower end of the ulna, or indeed the whole length of the superficial side of that bone, the malleoli, &c. The starched bandages also frequently dried in hard sharp ridges, forming indurated ring-like constrictions. From both these causes, particularly in children, mortification more or less extensive, resulted. A child was brought to me at the South-Eastern Dispensary, in whom a starched bandage applied for fracture in both bones of the fore-arm, and left on for many days had caused gangrene of a third of the fore arm, happily extending no deeper than the sub-cutaneous cellular tissue. In other

instances the mischief was much more serious, and several cases were published at the time exposing these injurious effects. Though such severe consequences were not always induced, the patients suffered such pain from the pressure of the hard ridgy bandage next the skin, that it became intolerable, and had to be taken off. In removing it another disagreeable consequence was found, in the adhesion of the bandage to the skin and hairs, so that the latter were obliged to be torn out, or painfully pulled, and bits of the cuticle were often removed. Applied in this way, and left on, no use could be made of it in compound fracture, as how could the discharge get out? nor in any fracture where the contusion or direct violence led to the expectation of much swelling. The starched bandage consequently fell into disuse. M. Suetin, of Brussels, visited Dublin, and exhibited at Streevens' Hospital his mode of application, which obviated all these objections, and ought, I think, to have led to a more frequent use of the starched bandage in the treatment of fractures. Like every inventor, M. Suetin applied it much more extensively than is likely to be done by any one else. He puts it on, for instance, in the very first instance, a proceeding the benefit of which appears to be very doubtful. I believe it is much better to let the first fortnight elapse, and the first accidents of swelling, vesication, &c., to subside, before putting the limb in the starched bandage; this is the plan I have followed in this hospital in a large number of cases, and in a more limited number of private patients, greatly to their comfort, as about the third week, the patients with broken legs, instead of being still confined to bed, can go about on crutches in the open air, a matter of great moment in delicate people, or those who cannot conveniently stay away from their business. But what I am anxious very briefly here to enforce is, the great value of the starched bandage in cases of broken leg, where, from any cause, the leg cannot be kept steady and motionless by the aid of the usual splints.

Some years ago, I saw, with Mr. Newland, of Camden-street, a gentleman who, while tipsy, had slipped off the pavement, and suffered Potts' fracture and dislocation of the left ankle. The foot was reduced, the displaced fracture put in proper apposition and kept so by side splints. The next morning every thing was right and the limb as I had left it. The third day I found all in confusion. In the night delirium tremens had manifested itself, by the patient getting out of bed, dragging the broken limb after him, without apparently feeling any pain, and searching about the room for a gun to shoot his aunt, whom he believed to be a Young Irelander! With great difficulty he was got to bed, and kept there, but he was constantly tossing about the broken

limb to the total derangement of the apparatus, and re-displacement of the fracture. It was quite clear, that even if the foot and leg could be kept tightly fixed, the incessant and violent motions of the body would twist and turn the upper fragment, and irreparable mischief take place. The only thing likely to answer was, to put the limb up in such a way that movement would not act injuriously on the fracture. The starched bandage seemed best likely to fulfil this indication, and accordingly during a lull, after the exhibition of opium, I applied it rather thicker and stronger than usual, and guarded by small wooden leg-splints. It answered perfectly, though for the next twenty-four or thirty hours the patient was delirious and most restless, and with difficulty kept in bed; the whole leg in the starched bandage moved about with perfect safety to the fracture. The delirium was subdued by the usual remedies, and the starched bandage kept on during the further progress of the case, which was quite satisfactory. Let me relate a more difficult case still of compound fracture of the leg:—

Patrick Shalvey, ætat. 56, admitted July 11th into No. 1 Ward, with compound fracture of the right leg. He had been wheeling a harrow of stones in Glasnevin Cemetery, along a plank ten feet above the bottom of a vault; he was pulled down by the wheel of the barrow slipping off the plank, and besides the injury by the height of the fall, he was much hurt by the stones falling about him. On admission there were found to be fractures of both bones of the leg above the ankle, the foot slightly everted. There was a small punctured wound through which the sharp end of the broken tibia had protruded, but no bone was now visible. From the opening came a considerable flow of blood, and there was much swelling from effusion of blood through the leg. Spasms occurred every now and then, his manner excited, but his pulse only 50.

His wife said that twenty-two years ago he had suffered concussion of the brain, and had remained insensible for twelve hours, and was so ill afterwards as to be confined to his bed for a month. For some time his memory was confused, and he used wrong words, and ever since has been subject to loss of memory.

He was placed on his side, and the leg put on a padded splint, the thigh and knee flexed, and a cold spirit lotion applied. He was so restless that the resident pupil gave him an anodyne, but it did not quiet him, and about three o'clock, as he complained of pain in the hypogastrium, and could not pass urine, the catheter was passed, and twelve ounces of water withdrawn, after which he went to sleep. On the following morning, the 12th, he was lying in a stupor, he could be

roused to answer a few questions, but soon dozed off again; no stertor, but the breathing heavy. Pulse 86, pupils natural. He continued during the day in a state approaching to coma, it being impossible to get him to speak, except yes or no, and this with difficulty; he was covered with a profuse perspiration. There was much effusion into the knee joint, and constant tremors and startings of the fractured limb, which he kept tossing about. The other limb had also strong muscular spasms in it. He was put on his back, and the leg in lateral tin splints, but he tossed them all about, and in the evening the tibia was bent at a considerable angle at the seat of the fracture; he was incessantly moving about and picking at the abdomen. Pulse 128; muscular tremors of the limbs almost continuous.

13th. Still in a state of stupor, tossing the limb about in the most careless manner, without evincing the least pain. His wife said he had several spasmodic shiverings of the entire body yesterday, and three times during the night, each lasting a few minutes. He was bled to eight ounces, when the pulse began to fail. The limb was placed on an inclined plane, with stout lateral splints, but this failed to prevent him jerking it about. In the evening and during the night he had several more of the rigors, which absolutely shook the bed. Some leeches were applied to the temples and cold lotion to the head, and he was ordered calomel and James's powder, a grain of each every hour.

14th. Insensibility continues: he moans and tosses himself about very much; his wife says he spoke to her this morning, and passed water himself, but was unable to call attention to it, though he evidently wished to do so. The tongue could be seen dark and dry. He was cupped from the temple to $\frac{5}{8}$ vi., but the pulse fell and became fluttering.

15th. Mouth slightly affected by the mercury, and he had some purging, and next day he was more rational; a blister was applied to the head, but the mercury was omitted.

He was constantly endeavoring to move his leg, which besides was agitated by frightful spasms, *during which the broken ends of the bone could be heard grating against each other.*

His mind better, but still confused; the spasms of the limb nearly as bad as ever, kept up, no doubt, by his extreme restlessness. Suppuration has taken place round the broken ends of the bone, which can be felt quite bare with the probe introduced through the wound; around this the integuments are dull red, œdematous, and obscurely fluctuating, and matter in small quantity can be expressed from the opening. He has troublesome diarrhœa, and to add another difficulty, the right

buttock is beginning to strip over a surface the size of one's hand. He could not, therefore, be kept any longer on his back, which was the only position in which any restraint could be secured against the motions of the broken limb.

It appeared to me that his only chance was to put up the leg in the starched bandage; with this alone he could move about or lay in any position without disturbing the fracture. I accordingly applied the starched bandage as high as two-thirds up the thigh, making an opening opposite the wound on the leg to let the purulent discharge escape. On the fourth day after the starched bandage was put on, he had improved amazingly. The mind clear, his nights good, and the spasms gone; the pulse fell from 108 to 96. From this time he never had a bad symptom, the wound quickly healed, and when the bandage was removed on the 4th of September, firm union appeared to have taken place. It was, however, re-applied and kept on til the 17th, when he was dismissed well, nine weeks after admission.

If we consider the difficulties in this remarkable case, the deranged state of mind destroying the perception of pain or motion of the fracture, which was therefore not guarded against, the fearful spasms absolutely grinding the broken ends against each other, the frequently recurring nervous tremors, the diarrhœa, and finally, the stripping of the back, the great value of the starched bandage must become strikingly apparent.

One word as to the method of applying it. An ordinary calico bandage should first be evenly applied from the toes to the knee, when the fracture is not above the middle of the leg, and above the knee when it is. The outside of this should be smoothly smeared with thick, clear starch, and a starched bandage rolled over this. Then pieces of pasteboard, soft and rather thick, and previously steeped in warm water, so that they readily mould themselves to the inequalities of the limb, should be put on each side of the leg and along the side of the ankle and foot, and also before and behind the seat of fracture. The pieces of pasteboard that go down the side of the leg and foot, when they have dried, make a kind of firm splint; they need not be broad, and should not be cut into the proper shape but torn, so that the edges are not hard and sharp, but gradually bevelled off. The whole should now be well and evenly smeared with starch, and then an unstarched bandage over all. It will be seen, therefore, that an unstarched surface is next the skin of the leg, obviating the objections I have mentioned, and that the outside of the apparatus is unstarched, preventing its troublesomely sticking to the surrounding sheets, and

also to the ordinary leg splints which it is advisable to put on for support, till the starched bandage becomes hard and firm. Forty-eight hours usually elapse before it dries completely. It should be slit up either with Scutlin's scissors, made for the purpose or what does as well, a wooden spatula or paper knife inserted under the edge of the bandage, which can thus be cut down with a pen knife, bit by bit the whole length. When all is seen to be right, the bandage can be closed again and kept so by the application of a little more starch and a few turns of a roller. The patient can now be allowed not only to move or lie on the bed as he likes, but may get up and go about on crutches, not leaning, of course, any weight on the broken limb.

THERAPEUTICAL RECORD.

Clay as a Poultice.—Clay mixed with water, and spread some lines thick upon a rag, is used in Germany as a poultice in cutaneous, cellular and lymphatic inflammations, in parotitis, periostitis, periphlebitis, &c. The application must be often removed.

Lemons as a Diuretic.—Dr. Trinkowsky, a Russian practitioner, as a result of 17 year's observation, speaks in high terms of the Diuretic power of lemons. They should be gradually increased till 18 are taken in a day, after which the number should be diminished. The diuretic effect has commenced on the seventh day, and continued during the whole of the treatment.

Iodine as an Anti-Emetic.—Dr. Euleburg, of Coblenz, tells us that the tinct. of Iodine, even in small doses, is one of the best agents for the relief of the vomiting which so often distresses pregnant woman. In addition to its anti-emetic quality, it calms the often accompanying cardialgia.

Iodid Potas in Scarlatina.—This salt has been highly recommended in this disease. It is to be given in grain doses, repeated at interval half hours. It has been employed by Dr. Charles E. Cady of the United States in over 100 cases with uniform success.

Colocynth and Nux Vomica.—In obstinate cases of habitual constipation, Dr. Haughton says in the St. Louis Medical Journal, you will find the following a very capital pill:—Half a drachm of Colocynth and three grains of extract of Nux Vomica made into twelve pills, one to be taken night and morning.

Perchlorid of Iron in Piles.—M. Thierry states that he treats hæmorrhoids even when large, by first blistering them and then applying the Perchlorid of Iron to the denuded surface, under the influence of which they sink and disappear. The same treatment does for Varix. The disease may recur but only after a long interval.

Pepsine.—The dose of Pepsine is about one scruple. It is prepared by washing the rennet bags of sheep, pigs, &c., and then scraping off their mucous membranes. These latter are then bruised and digested in distilled water for

12 hours. The resulting solution, after being filtered, is treated with Acet Lead; the lead precipitate is diffused in water and decomposed with sulphuretted Hydrogen. The fluid thus obtained after having been filtered, is evaporated to dryness. The article sold as Pepsine is made from this, mixed with an equal weight of starch, and a little Lactic Acid.

Glycerin, et al.—Dr. N. S. Davis, of the North Western Medical and Surgical Journal says, for cases of tubercular disease, before the cough is accompanied by much expectoration, we frequently prescribe ℞ Glycerin, ʒ ʒ, Iod. Potas ʒ ʒ. Sulphatis morphiae, — mix and give a teaspoonful before each meal, and at bed time.

PERISCOPE.

Treatment of Ovarian Cysts. In a discussion before the Academy of Paris. M. Velpeau believes that, perhaps, in the majority of cases, women having these tumors, may enjoy tolerable health for ten, twenty, or thirty years; in fact, the mean of ordinary life: but still there are others not so fortunate, but who succumb within the first ten years, whether from the excessive development of the cyst, its inflammation, the tapping it has rendered necessary, or intercurrent diseases. As to the palliative tapping, M. Velpeau had performed it so often that he had come to look upon it as a very simple affair, when he lost several patients in the course of a single year. As, for a reasonable chance of affecting a radical cure in these cases, the woman's health must be tolerably good, the surgeon is placed in the dilemma of determining whether he shall propose to a woman in good health an operation which may kill her, or abandon her to a disease that may become dangerous. Great as has been M. Velpeau's employment of iodine injections in other circumstances, he has always felt reserve in using them in ovarian cysts. Numerous facts have shown him that they exert remarkable power in dropsies of serous membranes, and that their success is less in proportion as the surface to be modified differs in structure from these. In cysts containing uncoagulated blood they may still exert good service; but they are of less use when the contents are gelatiniform, still less when puriform, and scarcely of any utility when the parietes resemble mucous membrane in structure. Observing the success of others, M. Velpeau has latterly had recourse to these iodine injections himself, and with some good results; and as he believes the injection of the iodine does not add to the danger of tapping, he thinks there is no reason why an attempt at curative should not be substituted for mere palliative treatment.

M. Jobert observed, that although simple tapping is regarded by some as an operation devoid of danger, under certain circumstances it is a very dangerous one. A capital distinction should be made between *adherent* and *movable* cysts, the operation never in the former case being attended with danger, while in recent, free, floating cysts, the fluid may get into the cavity of the peritoneum, and give rise to fatal diffused peritonitis. To prevent this, the canula should be maintained *in situ*, in order to determine adhesive inflammation between the contiguous surfaces of the cyst and the abdominal wall. No accidents have ever followed M. Jobert's operations when thus conducted. He has never observed a cure to result from simple tapping; but in two cases it has done so after multiple punctures, which have been followed by the deposition of plastic lymph in the substance of the tumor, and the obliteration of the sac. He has employed the iodine injections in thirty cases, and has never, observing the above precautions, met with any serious accident. In several cases a relapse has occurred, although the tumor had seemed to have been completely obliterated.

M. Cruveilhier remarked:—So parasitic is the life of ovarian cysts, that they remain completely strangers to all the great and organic movements of the economy; so that while dropsies of serous membranes may be often advantageously treated by internal medicines, these encysted dropsies are quite refractory. It is to surgical treatment that we can alone look with any hopes of success, but our decision to have recourse to this should be materially influenced by the anatomical characters of the cysts, which are far from being always the same. The differences are dependent upon the quality of the fluid, the disposition of the cyst, and its structure. (1.) It is of great importance, as regards facility of evacuation, whether the fluid be serous, viscous, albuminous, or gelatiniform, and the character of the fluctuation will to a certain extent enable us to pronounce upon the nature of this fluid. (2.) The cysts may be either unilocular, multilocular, areolar, or vesicular, and compound, the latter resulting from a union of the other varieties. (3.) In structure the unilocular cyst sometimes exactly resembles a normal fibro-serous sac, its interior being as smooth as if lined with serous membrane; but it is by no means rare to find the inner surface rugous, or raised by papillæ or vegetations of varying hardness, or occasionally the walls may contain cartilaginous or even osseous plates. In one of the varieties of unilocular cysts there are numerous imperfect divisions, allowing of intercommunication between the compartments. In what M. Cruveilhier terms areolar cysts, of which the vesicular is but a variety, the ovary has become transformed into an areolar mass, having commu-

nication between its meshes, and filled with albuminous matter, varying in consistency from the whiteness of egg to that of honey or jelly. The viscous nature of its contents explains the difficulty or impossibility of evacuating it after tapping. These cases may be regarded as absolutely incurable, not from their nature, which is not malignant, though they greatly resemble in appearance gelatiniform and areolar cancer, but owing to the viscous nature of their contents. Another incurable form is the multilocular cyst, having numerous and non-communicating cells, the contents of which are almost always albuminous. The multilocular ovarian cysts, which are alone amenable to palliative and curative treatment, are fortunately those most often met with. M. Cruveilhier approves of leaving them alone as long as possible.

The Medical Chronicle.

LICET OMNIBUS, LICET NOBIS, DIGNITATEM ARTIS MEDICÆ TUERI.

ANNUAL REPORT OF THE COMMISSIONERS OF EMIGRATION OF THE STATE OF NEW YORK, FOR THE YEAR ENDING DECEMBER 31ST, 1856.—The surgical department of the Emigrant Hospitals at Ward's Island, is under the charge of Dr. J. Murray Carnochan, as Surgeon-in-Chief, assisted by two salaried and constantly resident surgeons; the medical department is under the charge of Dr. H. B. Fay, as Physician-in-Chief, assisted by two resident physicians. Dr. Carnochan performs all important operations. There were cared for in the Hospitals during 1856, including 776 in Hospital on 1st January, 1856, together with 406 births, 6,147,—of whom there died 388. There were discharged, cured, or relieved, 4,979; remaining on 31st December, 1856, 780. The percentage of mortality was 6.31 per cent. on all cases treated, but calculated on the discharges, 7.32. The surgical practice embraced many serious cases, requiring important operations. The whole number of surgical cases was 1856, the number cured and discharged, 1401, and of deaths, 53, or about three per cent. on all cases treated.

BOOKS RECEIVED FOR REVIEW.—Gross' Pathological Anatomy, 1857. Kirke & Paget's Physiology, 1857. William's Principles of Medicine, 1857, from Messrs. Blanchard & Lea, Philadelphia. Report of the Commissioners of Emigration of the State of New York. Transactions of College of Physicians of Philadelphia. Dr. La Roche's Address to the Medical Society of the State of Pennsylvania.

PERSIAN BALM.—We would direct the attention of our readers to the advertisement of this excellent toilet article, which appears on the cover of our Journal. We have used it as a dentifrice, as well as for general toilet purposes, and can recommend it highly, as being one of the most efficient and agreeable preparations of the kind we have ever employed.

} SECRETARY'S OFFICE,
} Toronto, July 25, 1857.

MEDICAL APPOINTMENTS IN JULY.—His Excellency the Administrator of the Government has been pleased to grant Licenses to practise Physic, Surgery and Midwifery in Upper Canada, to the following persons, viz:

John Noble Agnew, of Duffin's Creek, Township of Pickering, Esq., M. D.; John Reeve, of Peterboro', Esquire, M. D.; Sylvanus Joy, of Otterville, County of Oxford, Esquire, M. D.; David Cameron McIntyre, of Nairn, County of Middlesex, Esquire, M. D.

He has also been pleased to make the following appointments, viz.:—Charles Rolls, Esquire, M. D., to be an Associate Coroner for the County of Middlesex; Orman Skinner, Esquire, M. D., to be an Associate Coroner for the County of Wentworth.

Montreal Light Infantry.—To be Assistant-Surgeon: Assistant-Surgeon Robert Godfrey, M. D., from the Second Battalion Montreal, vice Scott, appointed to the Volunteer Rifle Companies of Montreal.

Ninth Battalion of Montreal.—To be Surgeon: Assistant-Surgeon Eugène H. Trudel, M. D., vice Latour, left limits. To be Assistant-Surgeon: Olivier Raimond, M. D., Gentleman, vice Trudel, promoted.

Volunteer Foot Company of Artillery of Quebec.—Surgeon Philip Wells, is permitted to resign his Commission.

Surgeon James F. Wolff, 11th Battalion of Quebec, is appointed Surgeon to the 1st, 2nd and 3rd Volunteer Militia Rifle Companies of Quebec.

CORRESPONDENCE.

A STUDENT'S LETTERS.

No. II.

My attention has been a good deal directed to Orthopedic surgery. I have attended the Royal Orthopedic Hospital, and seen seemingly intractable cases cured in a perfect manner. In Montreal we see but very few cases of this description, but it is not, I think, that they do not exist, but that the people thus afflicted not generally knowing of the means of relief, seldom present themselves at the hospitals. I was informed by

the surgeon here, Mr. B. Broadhurst, (author of the works on club-foot and spinal curvature), on stating that cases of the kind did not appear to be very common in Canada, that it was the same here before the establishment of the hospital, but afterwards that people came from all quarters to be relieved; some even from Liverpool and other large cities in the central and northern parts of England,—there not being another in any of those places. I have been present very frequently at the treatment of the out and in-door patients, as well as at the operations. The hospital being as yet but small, can accommodate but few, the most being out-door patients. There are on an average from 40 to 45 a day,—the place is literally crammed, many not having seats.

It would be useless for me to describe the surgical operations as they are treated of in every work on surgery, and moreover, here they are not by any means considered as the most essential part to be attended to. It is the *after treatment* that must be depended on. I may here mention that they never operate twice even when the tendon has to be stretched two inches or more, the one being quite sufficient. Whereas, in the first hospital in London, three weeks since, I saw two or three tendons divided which had been previously operated on during last fall.

The treatment for talipes equinus is after the tendo achilles has been divided, to place the foot in the same position as it was before by curved splints, and then bandage up. The patient should keep the knees a little bent, and rest is better to be enforced. The natural heat also requires to be kept up by appropriate covering. On the fourth or fifth day after the operation Scarpa's shoe may be applied, it must be fitted to the angle at which the foot may be at the time of operation. Extension is now to be made slowly, and gradually increased until the heel is sufficiently depressed, and the foot flexed until it makes an acute angle with the leg. In children, when the muscles are healthy, three weeks will be generally sufficient to stretch the tendon. In paralytic cases longer time is necessary on account of the state of nervous energy and muscular debility. Extension should be made equally, whether slow or rapid, that the tendon may be equally strong, after five or six weeks the process will be completed, and the foot may be brought into use, the patient being furnished with a support attached to the shoe, having a stop-joint corresponding to the ankle, to prevent its being too much extended.

There is generally distortion of the toes more or less accompanying this deformity, but it seldom requires a special operation for removal. It being remedied when the foot is placed into its normal position, although some of the tendons will require at times to be divided.

The *after-treatment* of talipes varus does not differ much. It requires first to be reduced to T. Equinus, and then proceed as previously direct-

ed. To accomplish the first intention, on the third or fourth day the bandage and lint are to be removed, when the punctures will have healed. The foot and leg are then to be bandaged to a pliable splint placed on the outer side of the leg and foot, and by means of this moderate traction is to be kept up until the leg is not only in the median line, but a very little beyond it, which generally requires about three weeks to accomplish, it now being reduced to *T. Equinus*, is then treated as usual.

The distortions of adults are treated in the same manner, although it requires months with them where weeks are sufficient in infants. To form any idea of how these deformities can be relieved, you have only to walk through the wards, where you see numerous cases of double talipes varus; the sole of the foot never having been walked on, but turned towards its fellow of the opposite side; the patients having walked for years on the malleolus externus, and a very large bursa formed over that portion. Generally in cases of this kind one foot is operated on first, and in part restored, before the other one is interfered with; and, to enable the Surgeon to judge of the amount of benefit received, plaster casts are taken of all the cases, which thus give a certain knowledge of the progress of cure.

Mr. Broadhurst has lately made a great improvement in the common Scarpa's Shoe, by which every desired motion of the foot can be commanded, and most obstinate forms of varus are thus brought under the power of the Surgeon. In the common shoe, abduction and flexion are only provided for. I need not mention, that, in all the operations, subcutaneous incision is the method adopted.

Spinal curvature is also here treated on a different plan. The deformity caused by the old instruments, in place of removing the original, is now prevented by Mr. Broadhurst's improvement. The ribs are not interfered with; respiration unobstructed; and I have never heard the patients complain even when the instrument was tightly applied.

This branch of the profession is yet but in its infancy (so to speak), and no doubt a few years will greatly change its present appearance; however, in its present state, it demands attention. Even to give an outline of the treatment would require many more pages than could be here devoted to it. There are now several new works on the subject, in which all the latest information can be obtained.

London, 2nd July, 1857.

A. R.

HOSPITAL RETURNS.

Monthly return of Sick in the Marine and Emigrant Hospital, Quebec, from the 4th June to the 1st July, 1857.

	Men.	Women.	Children.	Total.
Retained	72	8	3	83
Since admitted.....	225	12	1	238
	<hr/>	<hr/>	<hr/>	<hr/>
	297	20	4	321
	<hr/>	<hr/>	<hr/>	<hr/>
Discharged.....	188	14	3	205
Died.....	7	1	0	8
Remaining	102	6	0	108

DISEASES.

Fever	24	Abscess	12
Inflammation of lungs.....	12	Ulcers	8
Inflammation of liver	1	Wounds	6
Inflammation of bowels	7	Contusions	20
Dyspepsia	2	Burns and Scalds	2
Rheumatism	28	Pregnancy	3
Dysentery	15	Roseola	1
Small Pox	4	Rubeola	1
Eropsy.....	1	Scarlatina	1
Cynanche	4	Neuralgia	3
Diseases of skin.....	8	Epilepsia	3
Inflammation of testicle	4	Delirium Tremens	3
Syphilis	33	Phrenitis	1
Fractures.....	5	Scrofula.....	1
Dislocation	1	Phthisis	1

C. E. LEMIEUX,
House Surgeon.

MEDICAL NEWS.

Her Majesty Queen Victoria, has been graciously pleased to bestow the honour of knighthood on her chief accoucheur, Dr. Locoek.—It has been suggested however, that this distinguished gentleman deserved after his arduous duties, to have been elevated to the peerage under the title of Earl Deliver us!—Dr. Cox of N. O. finds the sulphate of zinc the most useful remedy he has ever employed in the coliquative night sweats of phthisis—The Medical Press of France, like the political is under Governmental censorship.—The editor of the *Moniteur des Hopiteaux*, after having in a previous number stated his intention of discussing at full the reasons which in his mind proved Verger to be insane has been obliged in a subsequent one to announce that he is under the necessity of abandon-

ing the project.—Samuel D. Grimes died recently in Pike County, Georgia, at the age of 110 years, always having been in good health.—Ten feet below the surface, the complete skeleton of a buck was found at Nashville, Tennessee.—In England and Wales there are at this time 500,000 females more than males in census of population.—“How many deaths?” asked the Hospital Physician. “Nine.” “Why, I ordered Medicine for ten.” “Yes but one would not take it.”—The following is from the *Virginia Medical Journal*.—Owing to the neglect of the legislature to make the necessary appropriations, the asylums of Indiana for the deaf, dumb and blind, had been closed and the inmates returned to their respective counties.—Dr. Valentine Mott has been elected president of the N. Y. Academy of Medicine; he is still in active practice, and lately tied the common carotid for the forty-fourth time.—The Massachusetts physicians have lately organized a society for the relief of disabled physicians, and the widows and orphans of medical men; Dr. Geo. Hayward is president; the financial success of the society has already surpassed the expectations of its founders, and the association has proved also an additional link of brotherhood among the worthy members of the profession.—The doctors of Boston are making a great effort for the establishment of a free hospital, and the city council have reported in favor of such an institution.—The Massachusetts legislature has farther endowed their Female Medical College despite the governor's veto. It is said that the coarseness and vulgarity of the creatures licensed by this institution is only equalled by their ignorance.—Great complaints are made of the course of the faculty of the Massachusetts Medical College, in graduating persons whom they know will practice homœopathy.—The number of pupils in the Pennsylvania School for Idiots, situated at Germantown, is 33; Dr. Parrish, of the *N. Y. Medical Reporter*, is superintendent, and Bishop Alonzo Potter president.—Dr. Peaslee, of New Hampshire, is reported to have a work on physiology in press.—The fourteenth annual report of the Utica Lunatic Asylum, gives the following figures: Whole number treated, 697; discharged cured, 100; improved, 33; unimproved 65; not insane, 8; died, 30; total, 236; remaining Nov. 1st, 1857, 161; Dr. T. P. Gray, the superintendent declares that the hospitals of New York are altogether inadequate to the wants of the insane.—Dr. Kirkbride makes the sixteenth annual report of the Pennsylvania Hospital for the insane; Whole number of patients, 396; discharged, 172; a great number of applicants rejected.—Measures have been taken by the people of Brooklyn, to procure a memorial of Drs. Crane and Dubois, who died last summer attending the yellow fever patients of that city.—In a late discourse before the Mechanics Association, of Richmond, Governor Wise recommends the establishment of a professorship of veterinary surgery at the Virginia University.

ERRATA.

ERRATA.—Instead of Tincture arnica, ten ounces; aqua, one grain one drachm. in the last issue of the journal, at page 61, second and third lines: Read Tincture of arnicæ one ounce, water one pint: fiat lotio.