

# Photographic Sciences Corporation

23 WEST MAIN STREET  
WEBSTER, N.Y. 14580  
(716) 872-4503

**CIHM/ICMH  
Microfiche  
Series.**

**CIHM/ICMH  
Collection de  
microfiches.**



**Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques**

**© 1985**

# Technical and Bibliographic Notes/Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

- ☒ Coloured covers/  
Couverture de couleur
- ☐ Covers damaged/  
Couverture endommagée
- ☐ Covers restored and/or laminated/  
Couverture restaurée et/ou pelliculée
- ☐ Cover title missing/  
Le titre de couverture manque
- ☐ Coloured maps/  
Cartes géographiques en couleur
- ☐ Coloured ink (i.e. other than blue or black)/  
Encre de couleur (i.e. autre que bleue ou noire)
- ☐ Coloured plates and/or illustrations/  
Planches et/ou illustrations en couleur
- ☐ Bound with other material/  
Relié avec d'autres documents
- ☐ Tight binding may cause shadows or distortion  
along interior margin/  
La reliure serrée peut causer de l'ombre ou de la  
distorsion le long de la marge intérieure
- ☐ Blank leaves added during restoration may  
appear within the text. Whenever possible, these  
have been omitted from filming/  
Il se peut que certaines pages blanches ajoutées  
lors d'une restauration apparaissent dans le texte,  
mais, lorsque cela était possible, ces pages n'ont  
pas été filmées.
- ☐ Additional comments:/  
Commentaires supplémentaires:

L'Institut a microfilmé le meilleur exemplaire  
qu'il lui a été possible de se procurer. Les détails  
de cet exemplaire qui sont peut-être uniques du  
point de vue bibliographique, qui peuvent modifier  
une image reproduite, ou qui peuvent exiger une  
modification dans la méthode normale de filmage  
sont indiqués ci-dessous.

- ☐ Coloured pages/  
Pages de couleur
- ☐ Pages damaged/  
Pages endommagées
- ☐ Pages restored and/or laminated/  
Pages restaurées et/ou pelliculées
- ☒ Pages discoloured, stained or foxed/  
Pages décolorées, tachetées ou piquées
- ☐ Pages detached/  
Pages détachées
- ☒ Showthrough/  
Transparence
- ☐ Quality of print varies/  
Qualité inégale de l'impression
- ☐ Includes supplementary material/  
Comprend du matériel supplémentaire
- ☐ Only edition available/  
Seule édition disponible
- ☐ Pages wholly or partially obscured by errata  
slips, tissues, etc., have been refilmed to  
ensure the best possible image/  
Les pages totalement ou partiellement  
obscurcies par un feuillet d'errata, une pelure,  
etc., ont été filmées à nouveau de façon à  
obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below/  
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
					✓						

The copy filmed here has been reproduced thanks to the generosity of:

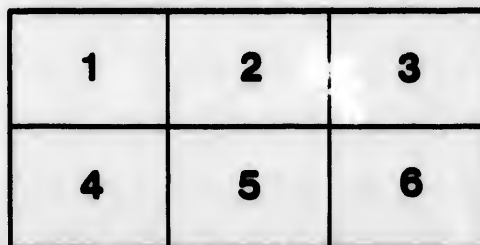
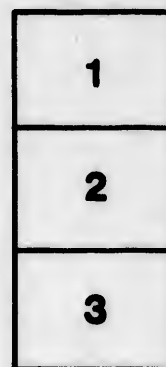
Medical Library  
McGill University  
Montreal

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol ➡ (meaning "CONTINUED"), or the symbol ▼ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

Medical Library  
McGill University  
Montreal

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole ➡ signifie "A SUIVRE", le symbole ▼ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.

E. Fenwick, G.E. 6175

EXCISION

OF THE

KNEE JOINT.

---

BY  
GEORGE E. FENWICK, M.D.,  
Professor of Surgery, McGill University, Montreal.

---

*(From the Transactions of the Canada Medical Association.)*

Montreal:  
PRINTED BY LOVELL PRINTING AND PUBLISHING CO.  
1877.





EXCISION  
OF THE  
KNEE JOINT.

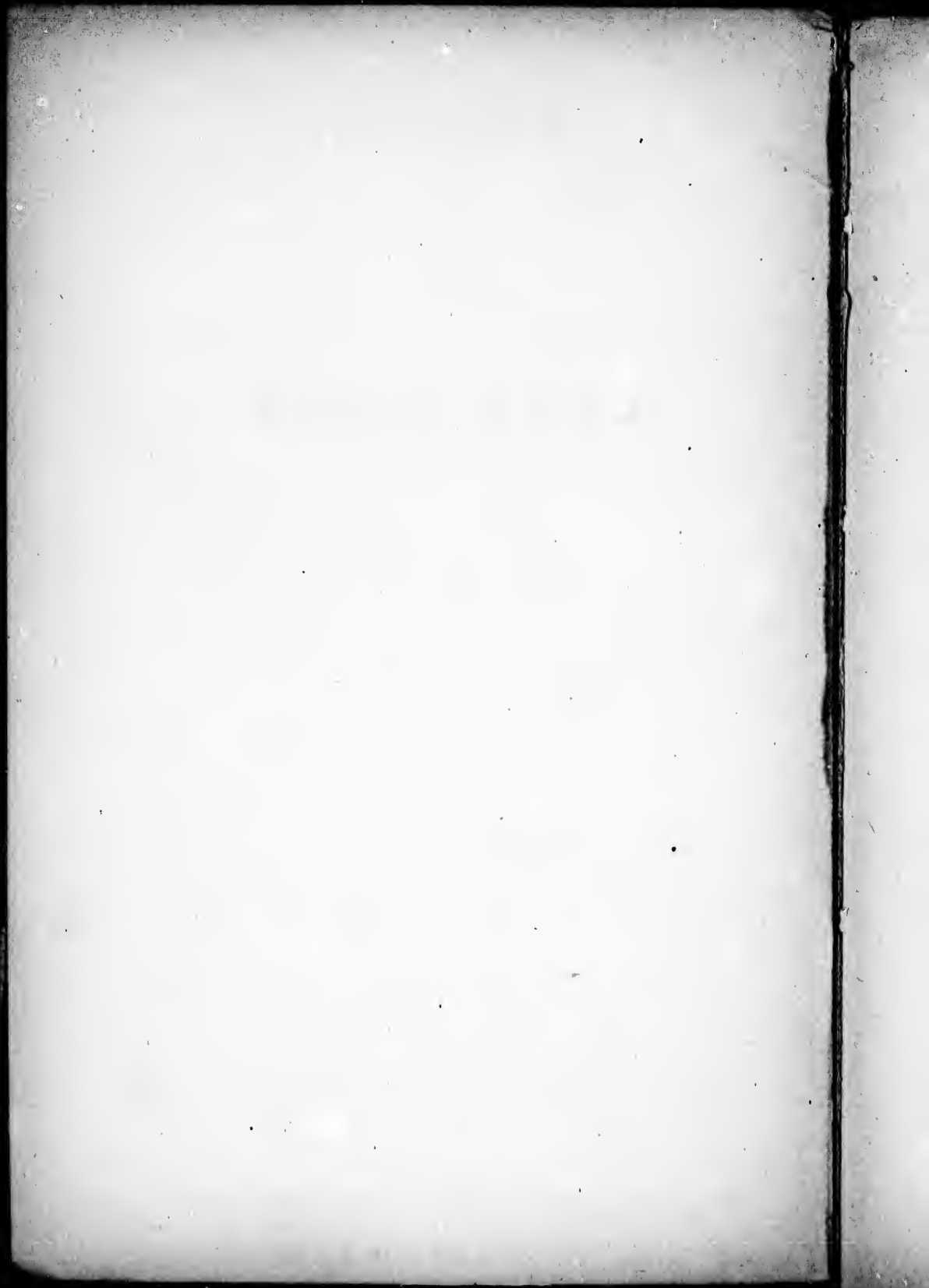
---

BY  
GEORGE E. FENWICK, M.D.,  
Professor of Surgery, McGill University, Montreal.

---

*(From the Transactions of the Canada Medical Association.)*

**Montreal:**  
PRINTED BY LOVELL PRINTING AND PUBLISHING CO.  
1877.





## EXCISION OF THE KNEE JOINT.

BY

GEORGE E. FENWICK, M.D.,

Professor of Surgery, McGill University, Montreal.

Considerable diversity of opinion exists at the present time as to the justifiableness of the operation of excision of the knee joint, and there are those who do not hesitate to condemn the operation as "one which will sooner or later fall into deserved desuetude." With a view of attracting more prominently the attention of Canadian surgeons to the subject of excision of the knee joint, I have prepared this paper, based mainly on the results of that operation as practiced in the Montreal General Hospital during the past twelve years. It must not be considered a reflection on the surgical experience or practical skill of the staff of our Hospital that the performance of the operation of excision should have been so long delayed after the published results of Sir W. Fergusson, Price and others, rather be it looked upon as an evidence of caution, in that the surgeons of our Hospital failed to recognise in cases submitted to their care those suitable for an operation of such magnitude. Let it be remembered that excision of the knee joint is an operation of greater magnitude than that of amputation at the lower third of the thigh. It is more difficult of performance, and the consequent shock is far greater; indeed, if we take the latest published statistics on this point, based on the results of 472 cases of excision of the knee joint, as compared with 431 cases of amputation at the thigh for disease of the knee joint, it will be found that, in the former case, excision of the knee joint, the mortality equals 27 per cent., against 22 per cent. of amputation at the thigh. This is taking an average of all cases, independent of age. Mr. Bryant, however, calls special attention to the greatly increased fatality of excision in young subjects, as compared with amputation. In his table he gives the results of excision in 97 cases, the patients being under twenty years of age; of this number 27 died. On the other hand, out of 69 amputations for chronic disease of the knee joint performed on patients under 20 years, he lost but three by death; which would make excision, when practiced on the young,

nearly seven times as fatal as amputation in the same class of patients. This result, although favourable to amputation, cannot be wondered at, when it is considered that many of the cases of excision, probably all of them, were submitted to the major operation after a long and exhausting siege of pain, suffering, and prostration of strength, from disease in which the bones entering into the formation of the joint had been implicated.

In considering the various diseased conditions in which the operation of excision may be practiced, we must affirm that much of the success attending this operation will depend on the judicious selection of cases. Sir W. Fergusson makes the following statement: "I myself have been too zealous, and resorted to the operation of excision when I should have selected amputation." In deciding this question we must regard the patient's age, his constitutional condition, and the extent and character of the disease present. Although excision of the knee joint has been practiced with success at all ages, yet it cannot be denied that the most favourable period is during young adult life. Statistics point to the fact that excision in children is seven times as fatal as amputation at the thigh. But in children there is a prominent objection to excision. I refer to the removal of the epiphyses, and the consequent loss of growth in the length of the limb. We must, however, remember that disease of the knee joint in children is commonly attended by arrest of development and that, although the disease may terminate in bony ankylosis, we frequently find the growth of the limb stunted. We may have, after the lapse of years of suffering, a limb very much shorter than its fellow. In proof of this I may cite the case of W. H., published in the January number, 1871, of the *Canada Medical Journal*. In that case, an illustration of which is subjoined, the patient, at the age of 12 years, had suffered from an attack of rheumatic arthritis. The joint became disorganized and pseudo-ankylosis occurred, the limb being bent at a right angle. At the time he came under my observation, he was 23 years of age. There was very slight motion in the joint. The patella was firmly attached to the external condyle of the femur. The limb was perfectly useless for progression, and for his relief I excised the joint, and he made a good recovery with a useful limb. Accurate measurement of the limb before performing excision showed a shortening of two inches in the length of the femur and one inch in the length of the tibia. I am by no means satisfied

that excision is not a perfectly justifiable measure in disease of the knee joint in children. I have, however, very limited experience to offer on this point, not sufficient at least to influence the judgment in this class.

In December, 1870, I excised a knee joint in a boy, aged 14 years, for chronic disease of ten years standing; and, with the view of saving portions of the epiphyses, in dividing the bones I made use of an ordinary fretwork saw, adjusted in Mr. Butcher's frame. A thin slice of the femur was removed, the end of the bone was rounded off, the entire diseased structure being taken away. The tibia was next attended to, and a thin slice removed, the reverse of that on the thigh bone, so that the two bones fitted quite accurately. For the ensuing six weeks the case progressed favourably, when symptoms of osteo-myelitis set in, for which amputation was proposed. The parents of the boy, however, insisted on taking him home, and he left the Hospital. Since then I have lost all clue to the case, except that I was informed some time back that the boy had recovered with a useful leg, and that he could walk without a stick, but this I cannot affirm from any personal knowledge, as the family live some distance up the Ottawa.

During the summer of 1874, while on a visit to Edinburgh, I related this case to Mr. Annandale of the Royal Infirmary, and he informed me that his practice was to excise the knee joint in children, and that in so doing he removed all the diseased structures with a strong knife, paring off the face of the bones, his object being to save as much of the epiphyses as possible. I have followed the method practised in the first case, as described above, in one other instance—the case being that of a little girl aged 10 years, whose knee joint I excised in 1875. There had been disease of the joint, implicating the bones, of some four or five years standing. The limb was bent at a right angle, and, from softening and relaxation of the ligaments, together with constant traction of the ham-string muscles, dislocation backwards of the bones of the leg had taken place. There was great difficulty after section of the bones and division of the ham-string tendons, in placing the bones in position, so that, to avoid bruising of the ends of the femur and tibia, a second slice had to be removed. This encroached very much on the epiphysis of the femur, and there was only a very small portion of it left behind. We had a great deal of trouble in the after treatment of this case, constant watching and attention being required to carry the child through a long siege of supuration and threatened pyæmia, but she ultimately recovered,

and is now able to set the foot to the ground, and bear her whole weight on the limb. She has grown considerably, but the limb does not increase in length in the same proportion as its fellow. This result I do not think is entirely due to removal of the epiphyses or their injury by the operation, since the previously existing disease must have had much influence in arresting the development of the limb. However, the patient has a limb, such as it is, with an ankle joint and foot, both of which, as time advances, will increase in efficiency and usefulness; whereas, had she merely a stump, the result of amputation, her condition would remain ever the same. So much, then, for the influence of age in the results of this operation; not only is it admitted to be most fatal in children, but the other considerations are of the highest consequence, as affecting the after usefulness of the limb in its arrest of development.

*Constitutional condition.*--I have already stated my conviction that excision of the knee joint is an operation of greater magnitude than that of amputation. From this I fancy there are few that will dissent. It is attended with a much longer confinement to bed, a longer period of absolute restraint in one position (on the back), which is very irksome; besides, we have the long continued suppuration and sometimes the burrowing of matter and formation of sinuses, in all instances requiring constant attention, and being also a great drain on the patient's powers of repair. Hence, in the selection of cases for excision, the surgeon should be careful to ascertain that he has no slumbering evil, no incipient or developed disease of the lungs, kidneys, or other viscera. After excision, the condition of the patient is such, that greater demands are made upon his reparative powers, and upon his ability to resist the long-continued suppuration which so frequently accompanies these cases. "It should be a golden rule," writes Swain, "one of the few without exceptions, that tubercle of the lung contra-indicates excision of the knee." It is true that Mr. Price reports a case of successful excision of the knee in a phthisical patient. This, however, must be regarded, as Mr. Swain truly observes, "as an exceptional case, one of those solitary instances of good luck, and good management as well, because the patient made a rapid recovery." In another case, also reported by Price, the patient developed acute phthisis and died. The condition of the heart and kidneys should always be ascertained before deciding on an operation for excision of the knee. Mr. Savory, on this

point, remarks, "that damaged kidneys have, as a rule, much more influence upon the result of an operation of any kind, or an injury of any kind, than a damaged heart, although the action of the kidneys is not so immediately necessary to life as that of the heart." It may be looked upon as a rule that recovery from excision is more tedious than from amputation of the thigh. There are some very exceptional instances on record of marvellously rapid recovery after excision of the knee-joint. Therefore, it follows in cases where some of the important viscera are engaged in diseases, and the constitutional ability of the patient is enfeebled, that when, from irritation in the joint itself, the constitutional disease is apparently increased, then indeed should the local malady be removed, and in doing so, the surgeon should select the operation that holds out the best chance for rapid recovery.

Again, in deciding the question of excision of the knee joint, the extent and character of the disease present must seriously engage our attention. While the disease is confined to the soft tissues, no operative measures should be entertained. If the synovial membrane alone is implicated, it would be highly improper to excise the joint. On this point Mr. Cadge of Norwich observes: "It will generally be found useless to remove the ends of the bones when the synovial membrane is the primary and chief seat of the disease." Mr. Price records twenty-one cases of excision of the knee for the removal of diseased synovial membrane, and they were all unsuccessful. In performing excision under such circumstances the surgeon opens a joint in which the principle tissues entering into its formation are unaffected by disease. The shock of such an operation would be very much greater, as it has been found that shock to the general system is greater in proportion to the integrity of the joint. If the synovial membrane is alone implicated, the bony structures are comparatively healthy. The bone tissue with their cancelli are not condensed by disease, and by opening this healthy bone tissue the risk of purulent absorption is greatly augmented. Acute suppuration is not a favourable condition for excisions. This is conceded by most surgeons. Exceptions, however, do occur, and successful results have followed excision in this condition. Mr. Holmes, in his work on the Surgical Diseases of Children, observes on this head, "Excision usually much increases the amount of suppuration, and generally excites a very great degree of surgical fever. Hence I should fear that it would very generally hasten the fatal event instead of

averting it; so that I have always preferred to amputate, though I do not deny that excision might succeed in occasional cases of acute abscess of joints."

Disease attacking the cartilage of the joint simplifies the question for operative interference. The implication of the cartilage, erosion, or so-called ulceration is soon attended with implication of the osseous structures, if, indeed, the bone is not the first structure implicated, and then follows a train of most distressing symptoms. In these cases we may believe that the integrity of the joint is destroyed. Here the surgeon may seek to secure ankylosis in a favorable position, and no doubt, in time, his labors may be crowned with success; but, in his success, the surgeon cannot restore a perfect knee; at best, he can alone have a stiff knee, and if in a child, most likely a dwarfed limb. But if, as so frequently occurs, a patient is brought to you with a limb flexed at a right angle, with a knee swollen, tender to the touch, with agonizing night startings, so that he awakes from sound repose to utter a cry of pain, all attempts at palliation in such a case will fail. Probably we may have sinuses leading into the joint, or reaching diseased bone; even in such a case ankylosis may sometimes be secured, but in the attempt, after many months of suffering, the patient will most likely be reduced to such a condition that operative measures of any kind will be very hazardous. But let us take the most favourable results, when ankylosis has followed after what we may term the expectant treatment, and it will be observed in very many cases that, after years of misery and constant attention, a hollow peace, so to speak, will have been entered into between the surgeon and the disease, which may at any time be broken. On this point I may quote Mr. Solly, who remarked in a clinical lecture delivered at St. Thomas' Hospital, in comparing the results of ankylosis from what he is pleased to term medical as distinguished from operative surgery: "I must confess that I have been disappointed in some of my cases of natural, as distinguished from artificial ankylosis, by their return to the hospital after I had hoped a complete cure had been effected." From the records of many British surgeons it would appear that in acutely painful articular disease, those cases in which the cartilages and bones are affected are most favourable for excision, and in selecting this operation its advocates recommend its early performance. This would appear to be one element of success:



though  
ases of

es the  
ne car-  
with  
is not  
f most  
that  
n may  
doubt,  
ut, in  
e; at  
most  
atient  
with a  
start-  
ery of  
Pro-  
ching  
nes be  
g, the  
oper-  
let us  
dowed  
ill be  
d con-  
tered  
time  
arked  
npar-  
term  
nfess  
al, as  
o the  
ted."  
that  
carti-  
, and  
early  
cess:

CASE I.—Fig. 1.



**EXCISION OF THE KNEE JOINT.**

Operation performed 17th May, 1865.  
Photograph taken 30th October, 1865, five months after the operation.

to wait long enough to be certain that the disease present is beyond all chance of amendment except by operative interference. Dr. Sayre, of New York, in discussing this subject, recommends that if the disease of the joint is not sufficiently extensive to warrant complete excision, you may remove all the dead bone by drilling and gouging; passing setons of oakum or perforated rubber tubing through the joint for the purpose of securing complete drainage, &c." Dr. Sayre is not very warm in his advocacy of excision, though he by no means condemns it.

Excision of the knee joint has been practiced for traumatic injury, gunshot wounds, both in civil and military practice. In this latter it is not advocated, in fact by many condemned. The chief reason appears to be the danger of pyæmia, which is the military surgeon's most formidable enemy. But more than this, one of the most difficult problems to the practical surgeon is the retention of the bones in apposition in absolute rest to secure union. Hence the surgeon in the field in the face of an enemy, with no permanent hospital establishment, is loath to attempt an operation which requires weeks, if not months of absolute rest to ensure success. On this head I may cite the record given in circular No. 6 from the Surgeon General's department during the American war. There is a table containing the results of eleven cases of excision of the knee for gunshot wounds of that joint with only two recoveries, the others were fatal. This is far from encouraging. In the Montreal General Hospital the operation of excision has been performed thirteen times with the following results:

No. of cases, 13; cured, 9; doubtful, 1; died, 1; amputated, 2.

Some of these cases have already been published in the *Canada Medical and Surgical Journal*, and, without repeating over the details of each case, I shall select as much as will add interest to this paper, and shall call attention to any special feature which may appear of importance.

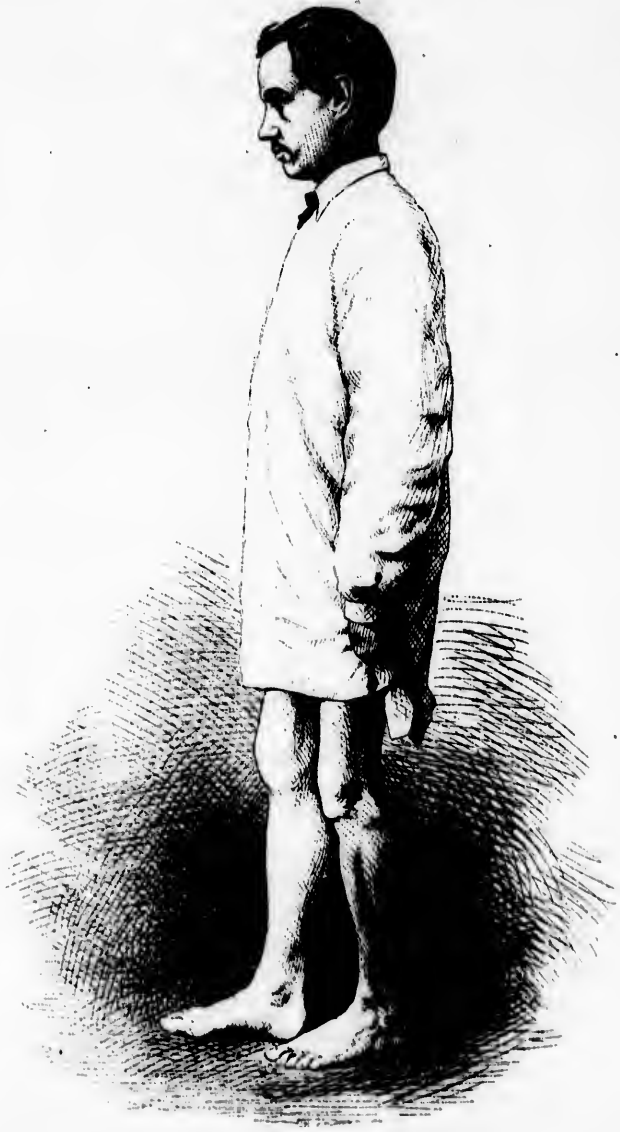
*Case I.*—Excision of the knee joint performed at the Montreal General Hospital on 17th May, 1865. The patient was a young man, æt. 18, who had suffered for some years from frequent attacks of synovitis. The disease first developed after the receipt of an injury to the joint from a severe kick. The joint became acutely inflamed, and he was energetically treated by leeching, local applications, and rest in bed. The attack was attended with some constitutional disturbance, and, at the end of six or eight weeks, he was able to go out, but the joint remained

stiff and enlarged; he was able, however, to get about, but could not join in play with boys of his age, as the slightest blow or twist would light up fresh inflammatory action, necessitating rest for days or weeks. Two years before he came under my observation he began to experience pain in the joint at night, and would suffer from severe startings, which occasioned much agony and interfered with his rest. At the time of his admission into the Montreal General Hospital he presented a care-worn appearance; there was loss of appetite, he was pale and anxious, and the affected limb presented a marked contrast to its fellow. The muscles of the affected leg were flabby and wasted, and the joint was by measurement an inch and a half larger than the other knee. On careful examination the condyles of the femur appeared to be expanded, there was evident pulpy thickening of the synovial membrane, and on motion, rotatory or lateral, of the joint, or on moving the patella, distinct roughness was found to exist. I have thus given a general view of the clinical features observed in this characteristic case, one by no means uncommon. In ten weeks after the operation all discharge had ceased, the bones were firmly united, the limb was supported by a gutta-percha back splint, and the patient was going about the ward on crutches. He rapidly gained strength, and, at the end of the fifth month, he could walk about the street with the aid of a stick. The photograph from which the engraving marked Fig. 1 is copied, was taken five months after the operation, and the patient walked down to the photographic gallery and returned, which was something over a mile from the Hospital.

Figure 2 is from a photograph of this man taken in 1870—or five years after his recovery—it will be noticed that the growth of the leg operated upon has been quite equal to that of its fellow, the muscular development of the calf is remarkable. The man has grown in stature some two inches, and the leg has grown in length in proportion to its fellow. There was one inch and three quarters of shortening after recovery from the operation, and the same amount of shortening was found to exist at the last examination made in 1870.

*Case II.*—This case was somewhat different in the character of the disease present, and in its mode of attack. The patient was a healthy, robust, well-developed man of 22 years of age. Nine years previously he had suffered from acute articular rheumatism, and, after three months' confinement to bed, he was able

CASE I.—Fig. 2.



EXCISION OF THE KNEE JOINT.

Photograph taken 5th December, 1870, five years after the operation.

to  
r  
A  
w  
th  
co

join  
and  
cic  
at  
the  
disc  
to e  
allo  
did

of t  
of a

to t



to get about, but the disease appeared to have located itself in the right knee joint, which remained very stiff, swollen and painful. At the time he came under my observation the right knee joint was partially ankylosed, the limb was bent at a right angle, and the patella was fixed, being attached by bony union to the outer condyle of the femur. At the inner side of the thigh, close to the



joint, there existed a sinus which led downwards to denuded bone, and on the outer side of the thigh there were the remains of the cicatrices, through which several pieces of bone had come away at different times. The operation of excision was performed on the 21st June, 1866, and about two inches of bone removed. All discharge had ceased on the 9th August, and firm union was found to exist. The limb was put up with a glue bandage, and the patient allowed to leave his bed; he rapidly gained strength, although I did not permit him to leave the Hospital for some weeks.

Figure 3 is from a photograph which was taken in December of that year. The patient at that time could walk without the aid of a stick.

*Case III.*—This was very similar in origin and general history to the one just related. It occurred in the person of a young

man, 23 years of age, not over robust, and whose history was as follows. At the age of 11 years he was attacked with acute synovitis, which had apparently followed a lengthened exposure to cold, as he had the previous day remained in the water bathing for several hours. When he came under my observation I found the leg flexed at right angles to the thigh. The bones of the leg were dislocated backwards, the condyles of the femur projected, and the patella was firmly attached to the external condyle. The whole limb presented a dwarfed appearance, and there was found to be shortening in the length of the thigh of two inches, and of the leg of one inch. The foot was very much arched, which gave to the heel a peculiar prominence, and the toes were semi-flexed. He could not use his leg in walking, his gait was very awkward, and to himself very wearisome, as he was forced to use a stout stick. There were no sinuses, nor had the joint been opened. Here was a case in which some surgeons would have practised subcutaneous division of the ham string muscles, and *brisement force*. I believe from the condition in which the bones were found subsequently that such an operation would have been attended with disaster and loss of the limb.

Excision of the joint, however, was advised, and the operation performed on the 28th May, 1870. The ham string muscles had to be divided before the bones could be brought into position, unless indeed an extra slice of bone had been removed; this I was desirous of avoiding on account of the already shortened state of the limb.

The bones when examined presented the following appearance. There existed caries of the head of the tibia and also of the extremity of the femur; the inter-articular fibro-cartilages were gone, the patella displaced outwards and firmly attached by bone to the external condyle of the femur. The case progressed slowly, as suppuration and burrowing of pus gave much trouble and constant employment, slitting up sinuses and using drainage tubes. The poor fellow sometimes became wearied, and requested that amputation should be performed. This, however, was not acceded to, and on the 14th November the report states: "He has been going out for a walk for the last ten days, and with a crutch and stick gets along very well. It was found that from the arching of the foot and the flexed state of the toes that he sustained his weight on the point of the heel and ends of the toes. To remedy this state I divided the plantar fascia and short flexor subcutaneously and straightened

CASE II.—Fig. 3.



**EXCISION OF THE KNEE JOINT.**

Operation performed 21st June, 1886.  
Photograph taken January, 1887, seven months after.

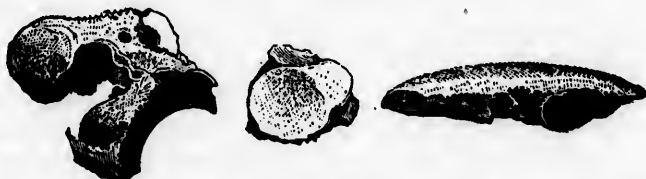
the f  
grea  
some  
was  
inche  
healt  
treat  
F  
gives  
C  
suffe  
into  
on ex  
woul  
He p  
very  
pain  
crura  
Unde  
on a  
I ex  
thick  
as th  
bone  
ment  
local  
derm  
acute  
l tap  
aspir  
with  
subsi  
of ac  
As se  
excis  
Decem  
to sav  
view  
some  
sweep  
ing a  
mova

the foot. This enabled him to bring the foot well down, and gave greater freedom to the motions of the foot. He left the Hospital some time in the month of February following, at which time he was able to use the leg freely. There was shortening to over four inches, which was made up by an addition to his boot. General health good. I have heard from this man once since he left Montreal and he stated that he was progressing favourably.

Fig. 4 is from a photograph taken in February, 1871, and gives a fair idea of the condition of this patient at that time.

*Case IV.*—This was in a boy aged 14 years. He had been a sufferer from a bad knee since his fourth year. He was admitted into the Montreal General Hospital in October, 1870. The leg on examination was found semi-flexed, it was exquisitely tender, he would cry out with agony or fear if even the bed was touched. He presented an anxious and care-worn appearance. The knee was very much larger than its fellow, and when handled gave great pain which persisted for hours. There was effusion into the sub-crural pouch, and his sleep was disturbed by frequent startings. Under chloroform the limb was placed in an extended position on a gutter splint, and while under the influence of the anæsthetic I examined the joint, when it was found that there was much thickening of the tissues around the joint and marked roughness, as though from erosion of the cartilages, between the ends of the bones as well as on the under surface of the patella. The treatment was chiefly palliative: absolute rest, good nourishment and locally hot fomentations over the joint. Morphia was given hypodermically, which secured refreshing sleep. By these means the acute inflammatory symptoms gradually subsided. Subsequently I tapped the joint at the inner side of the thigh with a small aspirator needle, and drew off a quantity of serous fluid tinged with blood. This gave him considerable relief and the startings subsided. Relief, however, was only temporary, and a fresh attack of acute inflammation followed, which was relieved as before. As soon as he was in a favourable condition, I recommended excision of the joint, which operation was performed on the 21st December, 1870. As the patient was a growing lad I determined to save as much of the epiphyses as possible, and with this end in view I adjusted to Mr. Butcher's frame a carpenter's whip saw, somewhat coarser than those used for fret-work. A semicircular sweep of the saw was applied to the end of the femur, thereby removing all the diseased bone so that the extremity of the femur after removal of the condyles presented a convexity. The head of the tibia

was next attended to and the surface was removed, rendering it concave. The patella was then removed, as its surface was found diseased. The leg was bandaged in the usual way and placed in a gutter splint with a vacancy on either side opposite the joint, the popliteal space being supported by a connecting shelf. After adjustment of the bones the flaps of the wound were brought together by interrupted metallic sutures. The shock after the operation was very marked, his pulse, which was weak, ranged from 160 to 180 per minute. His condition, however, improved, and at the end of a week suppuration and granulation of the wound progressed slowly, but he took nourishment well. The advantages in this method of section of the bones are two-fold. In the first place the smallest quantity of bone is removed, portions of the epiphyses are left, which to a growing individual is a great gain, and secures the after-growth of the limb; and, secondly, a larger extent of surface is secured, and from the shape of the cut surfaces there is less risk of displacement of the bones and forcing forwards of the end of the femur from contraction of the ham-string muscles unopposed by the quadriceps extensor which had been divided. In all the cases reported the bones were with difficulty retained in position. In all there was a tendency (in the thigh bone) to rise out of position. The accompanying woodcut is an accurate representation of the portions of bones removed.



The case progressed favourably at first, though the progress was very slow. The wound in the soft tissues closed with the exception of two or three points, sinuses, which led down to bare bone. At the end of six weeks he had a severe rigor, and symptoms of osteomyelitis set in, for which amputation was proposed, as his general health was failing and the discharge was considerable. His friends, however, refused to permit amputation, and determined to remove him to his home in the country. This was some time in the following March, and he left the Hospital. Since then I have lost all trace of this case, but have heard that the boy recovered with a useful leg. However, I have no positive evidence to offer on this head, and therefore record the result as doubtful.



CASE III.—Fig. 4.



EXCISION OF THE KNEE JOINT.

Operation performed 26th May, 1870.  
Photograph taken February, 1871.

of t  
coll  
ope  
ent  
nec  
cas  
wit

a m  
æt.  
we  
uni  
app  
que  
des  
an  
ren  
exc  
It  
lik  
con  
ed

ye  
dis  
He  
the  
ser  
Ex  
gre  
pla  
anc  
fro  
we  
ex  
I d  
go  
go

fro  
of

*Case V.*—This was a case of bony ankylosis at a right angle of the knee joint, which was admitted under the care of my colleague, Dr. Wright. For the relief of this deformity Barton's operation was proposed, but it was found necessary to remove the entire mass of what had been the knee joint. This was rendered necessary in consequence of the contraction of the muscles. The case progressed favourably and the patient made a good recovery with a useful limb.

*Case VI.*—Under the care of Dr. MacCallum was operated on a month or two after the one just reported. It was in an adult æt. 42. The patient progressed favourably for the first few weeks, the soft parts united and all discharge had ceased, but bony union was not secured. The limb was put up in a permanent apparatus, and he was allowed to go about on crutches. Subsequently the wound opened at several points. The man was desirous of having amputation performed, as time was to him an object, so that his wishes were complied with. The limb was removed and he made a good recovery. The bones were found in excellent position, but no attempt at bony union had occurred. It was in my opinion a case in which re-excision would in all likelihood have succeeded. A somewhat similar instance is recorded by Sir William Fergusson, in which that surgeon performed re-excision and secured a good result.

*Case VII.*—This was in a man aged 36, who had suffered for years from chronic synovitis resulting from injury, with ultimate disorganization of the joint and perfect inability to use his limb. He came from the country, and was brought to the Hospital for the purpose of having his limb amputated. His health was not seriously impaired, he was strong, robust and well nourished. Excision was performed 20 September, 1872, and everything progressed favourably for the first eight weeks, partial union had taken place, when unfortunately the poor fellow contracted small-pox, and he was removed to the small-pox department. He recovered from the attack, but when returned to me, I found the bones were lying in a huge collection of pus. Whatever union had existed before, there was certainly none at this period, so that I did what was deemed necessary, drained off the pus, built up his general health, and subsequently amputated the limb. He made a good recovery and left the Hospital.

*Case VIII.*—S. C., aged 23, had suffered for the past four years from a sore knee. Had always enjoyed good health up to the summer of 1868. She was a nervous, hysterical girl, rather delicate in appear-

ance, with florid complexion, blue eyes and fair hair. Her digestive organs were in good order, and she was regular. The attack appeared to come on from some over-exertion or twist of the joint while walking. This was in the summer of 1868. The knee gave her much pain, more especially at night, which deprived her of rest. There was swelling of the joint, and it was tender to the touch or in bending it. She was admitted to the Hospital in February, 1869, and was then treated for hysterical knee joint. Relief was given, and she was discharged, but again returned in a few months. On this occasion the joint was by measurement found larger than the other. There was considerable pulpy thickening of the tissues, and various means were resorted to for her relief, such as leeching, blistering, hot stupes, and putting the leg up with Scott's dressing. Towards the close of 1871 she was again admitted to the Hospital, and remained under treatment, but no permanent relief was given. In October, 1872, she suffered from night startings, the knee was exceedingly tender, and measurements showed the affected joint an inch larger than its fellow. Examination under chloroform revealed distinct roughness, and in consultation it was deemed advisable to excise the joint. The operation was performed on the 11th October, 1872. Erosion of the cartilages existed, and was tolerably extensive. About an inch and a half of the femur was removed, and a very thin slice of the head of the tibia. The bones, after the application of the saw, were found tolerably healthy. The patella was removed, as its free surface was implicated in the disease. The limb was placed on a padded posterior iron splint, being carefully bandaged from the foot to within half an inch of the lower margin of the wound. The thigh was secured to the upper part of the splint by straps well padded. The bones being accurately adjusted, the wound in the soft tissues was closed, and a lotion of carbolic acid applied with lint and oil silk. On the sixth day the patient was comfortable, temperature normal, and slight discharge from the edges of the flap. The wound in front was well united, and several stitches were removed. The first removal of the splint was effected on the 9th November, when it was found that the wound had almost entirely closed—leg washed, and again adjusted in the splint.

December 1st.—The leg again taken down. A small portion of the wound was discharging at the inner side, but firm bony union was found to exist. The splint was, however, re-applied, and the leg retained in the same position up to the 17th December,

CASE VIII.—Fig. 5.



**EXCISION OF THE KNEE JOINT.**

Operation performed 11th October, 1873.  
Photograph taken 20th March, 1873.

wh  
ba  
ing  
ba  
wa  
wa  
the  
sup  
pro  
wit  
ma  
sist  
her  
am  
a h  
at  
frie  
the  
ly  
stra  
firm  
erci

par  
seri

1873  
join  
past  
past  
quan  
were  
ethe  
the p  
of th  
face  
thick  
attac  
leath  
limb  
retur



when it was entirely removed, and the limb, supported by sand bags placed on either side, was laid on a soft pillow. The following day it was noticed that the limb was slightly swollen, so that a bandage was applied from the toes up to the groin. The bandage was removed each day and gentle friction practiced, when the limb was again bandaged. On January 2nd, 1873, or twelve weeks from the date of the operation, she walked the full length of the ward supported by two persons, one on each side. From this time she progressed rapidly, and soon acquired sufficient confidence to walk with crutches. The photograph from which the engraving Fig. 5 is made was taken on the 20th March, 1873, and she walked unassisted into the photograph gallery from the vehicle which brought her from the Hospital. By the most accurate measurement the amount of shortening in this case was found to be one inch and a half. This patient was discharged from the Hospital in April at which time she could walk with tolerable freedom. Her friends sent her to the country during the summer months, and the following October she returned to her family in Ireland. Shortly before leaving this country I examined the leg, and found it straight, well proportioned, the muscles of the leg and thigh being firm and well developed. She could sustain any amount of exercise, and walked with perfect freedom of motion.

*Case IX.*—I am indebted to my friend Dr. Drake for the particulars in this case and permission to include them in the series.

J. G., aged 22, came under the care of Dr. Drake, Sept. 15th, 1873, suffering from painful swelling in the right knee joint. The joint had been repeatedly injured by sprains, falls, &c., and for the past two years had been more or less swelled and painful. For the past three weeks the pain has been excessive, and he uses large quantities of morphia to alleviate it. Rest and palliative measures were resorted to till October 16th, when, the patient being fully etherized, the joint was excised. The semilunar incision was adopted, the patella removed, together with about 2 inches of the lower end of the femur, and  $\frac{1}{2}$  an inch of the tibia. The cartilages of both surfaces were considerably eroded, and the synovial membranes much thickened. The limb was put up firmly in a straight trough splint, attached by rivets to a pelvic belt made of wire and covered with leather, moulded carefully to the shape of the patient's body. The limb remained undisturbed for 73 days, was then dressed, and returned to the splint for 20 days. At this time, owing to a defect

in the splint, a superficial sore of some three inches in length was observed on the outer side of the thigh. The splint was removed altogether, and the limb steadied by means of sand bags. He remained in bed 43 days longer, and was then allowed to sit up, union being apparently complete. He left the hospital in March, 1873, with two or three small fistulous openings in the neighbourhood of the wound, which did not close completely for four or five months. Nevertheless, he was able to get about with the aid of a crutch, and came repeatedly to my office. It is worth recording that, on the evening of the day on which the operation was performed, a considerable hemorrhage occurred from the bowels, and this continued for three consecutive days and nights. The urine also was smoky, and contained albumen in considerable quantity. The albuminuria continued for upwards of twelve months, and was present when I last examined the urine, fifteen months after the operation. The limb is now (Jan., 1875) perfectly strong, the wound and fistulæ completely healed, shortening to  $2\frac{1}{2}$  inches. He expresses himself perfectly satisfied with the result, and says he walks as well as ever he did without a cane or support of any kind.

*Case X.* R. E., aged 20, was admitted into hospital in April, 1875, suffering from an attack of acute synovitis. The history is as follows: In October, 1871, he slipped while running, fell, and struck his knee a severe blow. The leg became swollen and painful; the pain, however, was not sufficient to oblige him to keep in the house, so that he continued to walk about. He experienced a sense of fatigue and also a creaking sensation in the joint while walking,—this sense of uneasiness obliged him to sit in the house after returning from school. Towards the end of the month of October he consulted Dr. Roger, who enjoined absolute rest, put the leg on a splint, and painted the knee with tincture of iodine. The leg was also blistered several times, which gave him relief. In February, 1872, he left Montreal and returned to his home in St. John's, P. Q., when he became the patient of Dr. Wight of that place. The same treatment of rest was followed out, and, at the end of a week or two, belladonna plaster spread on leather strapping, and a bandage, were applied over the knee. While under treatment an abscess formed, which was freely opened, and discharged for some five or six weeks. After the closure of this abscess he noticed that motion in the joint was less free, still he was able to go about with comparative comfort. In March, 1873, he again slipped while running, and twisted or sprained his

CASE X.—Fig. 6.



**EXCISION OF THE KNEE JOINT.**

Operation performed 13th July, 1876.  
Photograph taken June, 1877.

knee  
recov  
as be  
short  
hosp  
was  
of M  
this  
pus  
wer  
boy  
ture

fou  
ext  
dit  
ext  
thi  
18  
tol  
ing  
wa  
th  
A  
pe  
ba  
st  
w  
a  
o  
t  
h  
i  
t  
a

knee; this accident obliged him to keep his bed for six weeks. After recovery from this injury freedom of motion was much the same as before. Again in April, 1875, he met with a severe fall, and shortly afterwards, on the 29th April, he was admitted into the hospital. The leg was put up on a McIntyre's splint, and as he was somewhat run down tonics were given. Towards the middle of May an abscess was found to exist in the vicinity of the joint, this was freely opened and a drainage tube inserted. Subsequently pus formed at other points, both above and below the joint; these were treated in the usual way, free openings being made, and the boy was given nutritious diet, and ale, the quinine and iron mixture on which he had been placed being continued.

The patient came under my charge on the 1st July, 1875, and I found the joint open and sinuses leading to bare bone at the extremity of the femur. The boy was in a very unsatisfactory condition; however, I proposed excision and, if the disease was too extensive, determined to proceed to amputation at the lower third; this was agreed to, and the operation performed on the 13th July, 1875. At the end of eight weeks union between the bones was tolerably firm. There were one or two points still discharging a small quantity of pus, in fact, the amount of the discharge was so trifling that it did not more than moisten a piece of lint in the twenty-four hours. The rest of the wound was firmly united. As the patient was anxious to leave his bed a back splint of gutta percha was moulded to the limb, and it was put up in a glue bandage, openings being made in the bandage opposite the points still discharging for the purpose of changing the dressings, and he was allowed to get up and go about on crutches. He gradually acquired confidence in the strength of his limb, and, by the middle of January, could limp about with a stick. He returned home on the 2nd February, 1876. The following October he again presented himself for admission to the hospital, as there existed a somewhat indolent ulcer, five inches in length, situated on the outer side of the thigh, which had been treated with red wash and a bandage, but without much benefit. Simple water-dressing was at first employed, and cod liver oil with tonics and good diet. This had the effect of improving the character of the sore, when it rapidly healed by skin grafting. At this time the patient could walk without a stick, and stated that he felt perfectly secure on that leg. At the present time he is able to walk any reasonable distance without fatigue; the shortening is about 2 inches. This

patient was in the room at the time of the reading of this paper, and his leg was examined by the members of the association present. The appearance of the leg in this case is well shown in Fig. 6.

*Case XI.*—M. McG., a delicate looking girl, *æt.* 12 years, was admitted into hospital on 15th July, 1875, with disease of the right knee joint of several years' duration. The joint was flexed at a right angle with the thigh; there was dislocation backwards of the bones of the leg from contraction of the ham-string muscles. There were sinuses communicating with the joint which led into its cavity and reached bare bone. The muscles of the leg and thigh were very much wasted, soft and flabby, and the joint itself was tender, so that she would not permit examination, except while under chloroform. Excision was performed on the 10th August, 1875. In order to secure the after-growth of the bones the entire epiphyses were not removed from either the femur or tibia. The end of the femur was rounded off, making it convex, and the end of the tibia was treated the reverse of this, rendering it concave. There was much difficulty in straightening the leg in consequence of contraction of the muscles, so that, in order to prevent crushing of the ends of the bones, a second thin slice had to be removed from the end of the femur and the ham-string tendons had to be divided; the bones then came into position, but the tissues in the popliteal space appeared to be put on the stretch, this, in all likelihood, led to after difficulty in the management of the case, probably from stretching of the popliteal nerve. There was, throughout, great tendency to the formation of sloughs from pressure, so that, after the end of the first ten days, the splint had to be removed and the parts retained in position by means of a weight keeping up extension, and sand bags placed on either side of the limb; sloughs formed over the tibia, on the dorsum of the foot, and over the heel. The patient complained of a sense of tingling in the leg, but of no urgent pain. She progressed slowly, the sloughs separated, and healthy granulation followed with closure of the sores. The wound, the result of the operation, took on healthy action, and almost entirely closed, and, at the expiration of the fourth month, she was allowed to leave her bed and go about on crutches; bony union, however, was not complete, as, owing to the difficulty of retaining the parts at rest, some motion, though limited, existed. There was still slight discharge from the wound, but the patient was improving in general health. The following June she left the hospital, and returned to her friends. At this time she walked about on crutches

and was tolerably active. This patient was seen again in August 1877, when the following condition was found: Her general health was very good; union of the bones was firm; all discharge had ceased; the leg was slightly bent, and she could sustain the weight of the body on the leg; muscular development was markedly in abeyance, apparently because the little girl was disinclined to use the limb, and she was very active on crutches. The limb was by measurement two inches shorter than its fellow.

*Case XII.*—J. B., æt. 38, farmer, was admitted into hospital April 5th, 1877, with chronic disease of left knee-joint. Family history good. No history of tubercular, scrofulous, or rheumatic taint, up to commencement of present affection. Seven years ago enjoyed perfect health. At that time after working in cold water, the left knee became swelled and painful, particularly at night. The swelling was evidently synovial. Was not confined to bed, but has gone about ever since that time, though somewhat lame. At times after any slight injury the joint would become more painful. It was more swollen than it is now. Since last spring he has been unable to walk without crutches. He has had starting pains in the joint at night for the last year, and the same pain was produced by any jarring of the joint. There is great thickening about the joint. Circumference of the leg over the middle of the patella is  $14\frac{1}{2}$  inches, of the sound knee  $13\frac{1}{2}$ . The patella is fixed. There is very little motion of the joint possible. The limb cannot be straightened entirely, and scarcely flexed beyond its constant position. By flexion a grating sensation can be got. There is no pain when the joint is at rest. The muscles of the thigh are much wasted. The patient's general condition is good. No disease can be detected in any of the organs. Urine is clear and of normal appearance, acid in reaction sp. gr. 1020. No albumen or sugar. Excision of the joint was performed by Dr. Fenwick on April 11th. The limb was put up on a gutter splint moulded around the buttock so as to fix the pelvis as much as possible. A drainage tube was put through the wound. The incision healed by the first intention. The stitches were removed on the 9th day. There was a moderate degree of inflammatory fever with a rapid pulse, ranging from 108 to 124 till the 15th day, when the temperature became normal and the pulse 92. The temperature remained normal for three days, when after a chill it ran up to  $102^{\circ}$ . After this till the 1st of June there were fluctuations from high to low temperatures with occasional chills, and a



good deal of sweating. During this time there was evidence of much cellular inflammation around the joint, with the formation of some collections of pus. June 9th, the splint was removed and there was found to be tolerably firm union of the bones. A moulded leather back splint was applied with a narrow piece of wood at the back to strengthen it. Patient's condition now rapidly improved. June 20th.—Patient got out of bed on a wheeled chair, and in a few days he began to go about on crutches. At this time his temperature would run up in the evenings to 100° and even 102°. July 20th.—The leather splint was removed. Union now is quite firm. The wound is still open at the two angles of the incision. The discharge is very slight. The shape of the leg is good. The patient was discharged August, 1877, went to the country, being instructed to return when the wound had altogether ceased discharging. He can now bear a considerable weight on the limb, and goes about well on his crutches. He was thus four months in hospital after the operation. Since this report I heard from the patient, and he informed me that he was progressing fairly well, was able to get about, but lacks confidence, as he is always fearful of injury resulting from extra exertion or from falling down.

*Case XIII.*—F. P., æt. 17, a farmer's son, was admitted into the Montreal General Hospital on July 5th, 1877, with a chronic disease of the right knee. There is a history of scrofula on the father's side of the family. Patient says he was perfectly healthy until two years ago. At that time a swelling began in the right knee, which increased and diminished alternately, and was unattended by pain for about a year. He felt only a stiffness and numbness of the joint. He attributes the affection to overwork, especially mowing hay. About a year after the first appearance of these symptoms pain began to be felt, not very severe at first, without any increase in the swelling, until last Christmas. He could walk without much lameness. The pain and consequent lameness increased till in April he began to use crutches. Since then the knee has become fixed in a flexed position.

The measurements of the diseased joint as compared with the other are as follows:

Right Leg.	Left Leg.
Over the patella ..... 15½ in.	14½ in.
4 in. above " ..... 15½ "	14 "
4 " below " ..... 15 "	12½ "

There is much heat and tenderness about the joint. It is red and bulging on the inner side near the border of the patella. Fluctuation here is evident. There is partial ankylosis of the right elbow. He cannot extend the forearm completely. There is no displacement of the bones; some swelling and slight tenderness between the olecranon and external condyle. This condition began a year ago. Has felt neuralgic pains at times darting through the joint, and suffered from sciatica at the same time. The patient is a good deal emaciated. Appetite is good. Heart, lungs, and liver are normal. Examination of urine gives a negative result.

July 7th.—Excision performed. Much pulpy degeneration of the joint, not much pus. Spots of ulcerated cartilage on both condyles of femur. Considerable degeneration of the lateral condyloid notch. The semilunar cartilages of the tibia were entirely destroyed, and several diseased spots were found on the articular surfaces of the tibia. The excision produces shortening of the limb by about  $1\frac{1}{2}$  inches. The limb was put up on a gutter splint, cut out at the knee, and extending up the side so as to fix the pelvis.

July 11th.—Patient feels comfortable. Wound looks clear and healthy. Urine and other excretions normal. Appetite poor. Tongue heavily coated. Vomits occasionally. Bed sores appearing over the sacrum.

July 21st.—Removed stitches, wound looking well, united superficially, drainage tube still in. There are frequent spasms of the flexors of the thigh which cause great pain. General condition seems to be improving. No night sweats. Tongue clear. Pulse 132, temperature  $100\frac{1}{2}^{\circ}$ . Sleeps well after morph. gr.  $\frac{1}{4}$  hypodermically. Appetite very good.

July 25th.—Temperature last night  $104^{\circ}$ . Ordered quin. grs. xv. Morning temperature  $98^{\circ}$ . Passed a good night. Gets M. grs.  $\frac{1}{4}$  hypodermically night and morning. Pulse 124, it has been very rapid throughout. Knee dressed once a day, and lightly bandaged with a many tailed bandage.

July 29th.—Diarrhœa for last two days. Increase stimulant, brandy 6 ounces. Ordered pill plumbi c opio. Tongue dry. Large slough over sacrum.

July 30th.—Diarrhœa persists. Lost appetite. Tongue dry. Pulv. kino. co. and starch and opium enemata given. Patient getting very weak. Some dusky red blotches on back of left forearm and

one over styloid process of right ulna. Diet of boiled milk. Patient sweats considerably, no chills.

July 31st.—A large collection of pus on outside of leg below the knee was discovered and opened. The pus was very fetid. Introduced a drainage tube. Ordered frequent syringing of opening with carbolic lotion. Discharge from wound of operation scanty.

Aug. 1st.—Bowels moved five times during night. Slept pretty well, did not sweat. Pulse 120, temperature  $98\frac{1}{2}^{\circ}$ . Tongue moister. Ordered a mixture of ac. sulph. co., spt. chloroform, and decoc. hæmatox. Red blushes on left forearm disappeared.

Aug. 3rd.—Diarrhœa less, slept well. Tongue clean and moist. Wound improved in appearance, discharge more healthy looking and more copious. No sweating. Pulse 128, temperature  $98\frac{1}{2}^{\circ}$  in morning.

Aug. 5th.—Pulse 124, temperature  $99\frac{1}{2}^{\circ}$ . Diarrhœa continues. A blush with œdema on forehead. Felt chilly yesterday. Patient very weak. Tongue clean but glazed.

Aug. 6th.—Patient continued to get weaker and died at 9 p.m. No autopsy was allowed, but the leg was examined. There was found to be no union between the bones. There was a collection of unhealthy pus around the lower end of the femur, which was partly stripped of periosteum and necrosed superficially.

I am indebted for the reports of cases Nos. XI. and XIII. to the late Dr. J. D. Cline, who was my House Surgeon during the period that they were under observation. Case XIII. is from the record taken at the time by the Clinical Clerk, Mr. D. F. Smith, and is very carefully and accurately reported.

y  
.  
.  
.  
.  
s  
n  
A  
y  
.  
.  
s  
f  
s  
o  
e  
e  
n,

No. Name and Age.	Condition of Joint.	Date of operation.	RESULT.			Amount of shortening.	No. of days in bed.	Operator.
			Cured.	Amputat'd	Died.			
1. J. K. Man Aged 18.	Chronic disease of left knee joint from injury, 7 years' duration.....	17 May, 1865	1	.....	.....	1½ inch. ....	70 days .....	Dr. Fenwick.
2. J. D. Man Aged 22.	Chronic disease from rheumatic inflamma- tion of right knee joint, partial ankylosis, 9 years' standing.....	21 June, 1866	1	.....	.....	2 inches .....	56 days.....	Dr. Fenwick.
3. W. H. Man Aged 23.	Partial ankylosis in bent position, 9 years' dura- tion. Arrest of growth of bones in length.....	23 May, 1870	1	.....	.....	4½ inches.....	154 days.....	Dr. Fenwick.
4. J. McK. Boy aged 14.	Chronic disease of 10 years' standing.....	24 Dec., 1870	Doubtful	.....	.....	2 inches.....	Patient ta- ken to the country by his friends; result not hopeful ....	Dr. Fenwick.
5. Boy aged 16.	Complete ankylosis at a right angle.....	.....	1	.....	.....	3 inches.....	125 days.....	Dr. Wright.
6. Man aged 42.	Chronic disease of long standing .....	.....	.....	1	.....	.....	No union of bones in this case, the pa- tient insisted on having the leg am- putated.....	Dr. MacCallum.
7. F. K. Man Aged 36.	Chronic disease, result of injury, starting pains at night, unable to use the limb; several years' duration.....	20 Sept., 1872	.....	1	.....	Partial union of bones. Contracted Small Pox, Extensive sup- puration, necessi- tating amputation..	.....	Dr. Fenwick.
8. S. C.	Disease of left knee joint	11 Oct.,	1	.....	.....	1½ inch .....	84 days .....	Dr. Fenwick.

7. F. K. Man Aged 36.	Chronic disease, result of injury, starting pains at night, unable to use the limb; several years' duration.....	20 Sept., 1872	.....	1	.....	Partial union of bones. Contracted Small Pox, Extensive sup- puration, necessi- tating amputation...	.....	Dr. Fenwick.
8. S. C. Girl aged 21.	Disease of left knee joint of five years' duration..	11 Oct., 1872	1	.....	.....	1½ inch .....	84 days.....	Dr. Fenwick.
9. F. D. Man Aged 22.	Chronic disease of knee joint.....	16 Oct., 1873	1	.....	.....	2½ inches .....	136 days....	Dr. Drake.
10. R. E. Man Aged 19.	Chronic disease of right knee joint.....	13 July, 1875	1	.....	.....	2 inches.....	56 days.....	Dr. Fenwick.
11. Mary McG. Aged 12.	Chronic disease with backward dislocation of bones of leg, partial anchylosis in bent po- sition.....	10 August, 1875	1	.....	.....	2 inches.....	212 days....	Dr. Fenwick.
12. J. B. Man Aged 38.	Chronic disease of knee joint, result of injury...	11 April, 1877	1	.....	.....	2 inches.....	98 days.....	Dr. Fenwick.
13. F. P. Boy aged 17.	Chronic disease of joint implicating bones.....	7 July, 1877	.....	.....	1	Died from Pyæmia...	30 days.....	Dr. Fenwick.

