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REPORTS

To W. Keble Esq.

With IN *the Hundred Years*
and other Reports
of the

OPERATIVE SURGERY.

BY

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ETC. ETC.

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REPORT
OPERATIVE SURGERY
BY
RICHARD W. POTTER, M.D.

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THE
DUBLIN QUARTERLY JOURNAL OF MEDICAL SCIENCE
BY W. M. H. H. H.
1857

REPORTS

IN

OPERATIVE SURGERY.

1. SUCCESSFUL EXCISION OF THE KNEE-JOINT.
 2. SUCCESSFUL EXCISION OF A LARGE PORTION OF THE FEMUR.
 3. ON FATAL BLEEDING IN PSOAS ABSCESS FROM ULCERATION OF THE CAVA.
 4. LIGATURE OF THE POPLITEAL ARTERY.
 5. ON THE TREATMENT OF THE SUPPURATIVE CRISIS OF JOINTS BY FREE INCISION.
 6. SUCCESSFUL EXCISION OF A LARGE PART OF THE UPPER PORTION OF THE TIBIA.
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CASE I.—*Excision of the Knee-Joint; recovery, with an admirable limb.*

I recur to the operation of excision of the knee-joint with a pleasure of no ordinary kind; its history is one of deep interest to the inquiring surgeon. Established boldly by Park and Moreau, and that, too, by practical illustration amply afforded: nevertheless, by carelessness, mismanagement, and probably

incompetency on the part of imitators, it was too hastily put aside, and for years the operation was never mentioned or reverted to except with obloquy. Better things, however, were in store for it: taken up again, and that recently, by one whose name is closely identified with all the improvements of modern surgery (I refer to Mr. Fergusson, of London), he, in his wisdom, skilled in all operative measures, thoughtfully weighed the arguments for and against this bold procedure,—the casualties possible to take place, the advantages likely to occur: the latter turned the balance. Though defeated and baffled at first, he was soon followed and supported by others, who trusted in his example, and success crowned these efforts. Never was a capital operation taken up so quickly, or practised so extensively, as that of excision of the knee-joint, within so limited a period as that since its revival. Surgeons seemed honourably to vie with each other in arriving at the truth, and making every fact known. I may faithfully attest this, because in the accumulated information contained within the two memoirs on excision of the knee-joint that I had the honour of laying before the profession, will be found the ready answers to each inquiry that I instituted from every practical and distinguished surgeon therein named.

In the papers referred to, and published in this Journal, several practical deductions were arrived at from the given premises, and it is with an innate satisfaction I reflect upon the laudatory manner in which my humble efforts have been estimated in the cause of conservative surgery.

The valuable hospital reports, in the periodicals of the day, sufficiently attest the great value of the operation, and it would be superfluous to dwell upon the several instances in which it has been performed during the past year. Though arguing in this way, I trust I shall be excused for laying before my readers the following case, which I operated on a few months ago. I hesitate not in doing so, because it affords many striking features confirmatory of my views, and because it yields me another opportunity of dwelling upon a few points that I would wish further to elucidate and expound.

Timothy Swift, aged twenty-seven years, a labourer, admitted into Mercer's Hospital April 8, 1857. *History.*—In February, 1854, the man was carrying a heavy sack of wheat; he slipped and fell to the ground; the weight crushed the limb. His left knee suffered severe stretching and contusion, which confined him to bed for nearly three months; after this the

joint was stiff, and performed its motions very imperfectly, yet he returned to his employment. Shortly after, a dull pain lurked in it, greater at some times than at others, and some swelling remained. In about seven months after the primary accident he tripped in jumping over a ditch, and violently wrenched the joint a second time, after which he was obliged to remain in the house for several days. A few months passed over, and again he endeavoured to earn his livelihood by employment; at this time frequent exacerbations of pain seized upon the part, and stiffness of the articulation increased. In this way he persisted in working on, but could not run or move the leg rapidly. Things thus progressed until about sixteen months before his admission to hospital, when he was violently thrown from a restive horse that he happened to be riding; the animal fell upon him heavily, bruising the left knee again; immediately after the accident the left leg and thigh swelled rapidly, and the patient was laid up, confined to bed for about six months. After this he was treated by several medical men, but with no marked benefit, when he came to Dublin, in September, 1856, and was subjected in several hospitals to the most appropriate treatment. Not obtaining relief, he became discontented, and placed himself under the care of a quack doctor, who took all the money he possessed, and then dismissed him with the pleasing consciousness that he could not be cured. On the date already mentioned he sought my advice, and was admitted to hospital. Though his general health was not shattered to any alarming degree, there were many symptoms that awakened in my mind an apprehensiveness of tampering any longer with a disease that was gradually, slowly, and surely undermining the healthy springs of life. The injurious consequences originating and set up from the local malady threatened, and that not far off, a more dangerous manifestation of their withering effects,—in few words, the management of the case required decision, promptitude, and judgment. The constitutional sympathy was evidenced by a rapid pulse, never below 100; impaired digestion by a capricious appetite, frequent nausea, often vomiting. The body was but little wasted, yet, on looking to the local changes, a very marked difference existed between the volume of the sound limb and that of the affected one. The right thigh measured in its circumference, at the widest part, $20\frac{1}{2}$ inches, while the corresponding measurement, in the affected limb, was only 15 inches. The widest part of the calf of the sound limb measured $11\frac{1}{2}$ inches, while that of the left was only 9 inches. The out-

line of the joint was lost, and its configuration spoiled; a puffiness of the soft parts filled up each sulcus around it, so that its walls and boundaries presented rather a cylindrical form. The patella was movable; there was free motion of the leg in every direction; great lateral mobility; that is, on the leg being pressed one way and the thigh to the opposite side, an unnatural amount of lateral motion was permitted, only to be explained by the destruction of the interior restraining ligaments of the joint; flexion and extension, to a certain extent, were permitted; indeed extension was allowed nearly to the full, but flexion beyond a right angle induced the greatest torture: percussion at the heel elicited at once deep suffering and excruciating torture in the joint, so as to make the patient start with terror and alarm; there was no increased secretion within the joint, or marks of abscesses as having ever occurred. It was clear that the diagnosis pointed to thickening of the synovial membrane and ulceration of the cartilages, destruction of the head of the tibia to a greater extent than that of the condyles. All particulars considered, the case was by me considered perfectly suitable for excision.

On the 15th of April, 1857, I proceeded to operate after the following manner, the patient being placed under the influence of chloroform. I adopted the H-incision, the cross line passing beneath the patella; the flaps were with rapidity dissected back, and the shreds of the crucial ligaments spared by disease were divided, and next the lateral ligaments; in freeing the ligamentous attachments to the bones behind, the greatest precaution was adopted; all being separated to the extent required, I swept the knife around the tibia and the femur close to the attachment of the soft parts, and then took the saw bearing my name, and cut the bones from behind forwards. It is necessary here to lay caution on the operator in using the saw; he should ever remember the altered position of the limb, to facilitate the protrusion of the ends of the bones, and according to the angle of elevation must the direction of the blade of the saw traverse. The simple rule I would lay down for the correct execution of the section is this,—the blade of the saw must pass in a direction parallel with a line drawn in the transverse axis of the articulating surface; accordingly, this procedure was carried out; thus, when the limb is placed in a horizontal position, the one in which it is to be maintained for cure, the cut surfaces of the bones will be evenly together, no space will intervene between them behind or before; the wide surfaces oppose each other; all disposition to gliding one from the other

is guarded against, and the most favourable circumstances are insured for intimate union. In the published records of cases it will appear, that, in some instances, the surgeon has had to apply the saw a second and a third time, to make the bones meet; if this be so, I am then warranted in enforcing my advice. By section planned after this method, the condyles of the femur, with their connecting osseous bond, to the depth of a quarter of an inch, were removed, and a slice from the upper surface of the tibia, nearly three-quarters of an inch in thickness, was cut off. To warrant the removal of these parts I may just state, that the incrustating cartilages of the condyles were entirely removed; the head of the tibia was similarly affected, and in addition deep pits were excavated by caries in each condyle, to the depth of a quarter of an inch. This being effected, all the thickened and diseased synovial membrane was clipped away, and the disorganized fatty mass below the patella; not a trace of the interarticular cartilage remained; the patella was coated with lymph beneath, and appeared to have struggled healthily from the disease around; it was, therefore, suffered to remain. Thus, then, the accuracy of the diagnosis was established, and examination of the osseous surfaces pronounced them healthy. Three arteries which bled rather freely were next tied; the flaps at the transverse incision were brought together and maintained so by fine points of interrupted suture, and the lateral incisions were left open for the ready escape of blood and serum, the purging of the cut parts. The leg was with ease put into the straight position, and placed at once in the padded box-splint I had prepared for its reception; a splint was then laid over the anterior part of the thigh and the tapes fastened, sustaining upwards the hinged sides of the box; the foot was steadied by a footboard falling into the grooves within, and thus the leg was pressed upwards, so as to keep the divided osseous surfaces in contact; lint steeped in cold water was laid along the lateral incisions, and maintained accurately in position by the sides of the box when elevated. The chloroform acted admirably: though the man was at first thrown into some violence, yet, after the lapse of a few seconds, he was totally subdued, and slept unconsciously all through. Shortly after the anæsthetic was discontinued, he awoke quickly, and was unconscious of the operation having been performed. Thus, quite conscious, with the limb immovably adjusted, the man was removed from the operating theatre to bed, when he got a full draught of wine. Shortly after, he discharged his stomach, a not unfrequent consequence after the use of chloroform. This sickness should be watched for, anticipated on the part

of the surgeon; and, after emesis has taken place, the pallor, coldness, and collapse, can readily and entirely be removed by a full warm stimulant—none better than a hot tumbler of punch with an opiate in it. Such was administered in this case, and by me in many others, with the desired effect, persistent quietude of the stomach; to restore general warmth, heat should be applied to the limbs and body. In two hours after the operation reaction was fairly established, and the patient complained of pain; a general weeping took place from the external lateral incision, and also from the internal; the quantity was such as to call for interference to check it, and it was very simply done. The sides of the box were let down, and compresses of fine lint laid over the points from where the blood issued most copiously, and finger pressure maintained them in their places; all disposition to hemorrhage ceased by a perseverance in this mode of treatment for little more than half-an-hour; then gently the hands were taken away; a few additional pads were laid over each compress, so that when the sides of the box were again elevated, a gentle and equable support was more forcibly afforded throughout. Thirty drops of tincture of opium were given every third hour; and I ordered ice to be placed in the mouth to quench thirst. 7 P.M. No return of bleeding, and pain not considerable; reaction fully developed. 9 P.M. Pain very trifling, and dozed away; gave a tumbler of punch and thirty drops of tincture of opium, after which he slept steadily; though, before this, he had slight spasms and tendency to startings of the thigh forward; however, this was controlled by the anterior splint and the full opiate, which now completed the sedative influence of the drug.

April 16th. Had a good night, and slept with tranquillity, and this morning is much refreshed; pulse 104; tongue furred, with thirst; urine freely passed in quantity, yet skin hot; limb lying in excellent position, and exempt from pain; took some tea and toast for breakfast. 3 o'clock P.M. Continuing to feel comfortable; opium to be continued. 9 o'clock P.M. Free from pain, no uneasiness whatever in the limb; thirst alleviated by effervescing draughts in combination with the opium, and by the placing of small morsels of ice frequently in the mouth.

17th. Had an excellent night; pulse 100; skin still hot, but thirst diminished; full opiates every third hour throughout the day.

19th. Going on most favourably: the patient slept all night, he took his toast and tea for breakfast with appetite. Let down the sides of the splint, the external and internal alter-

nately, to soak up the fluids discharged from the wounds, which was quite practicable without stirring the limb from its posterior support. The full opiates to be continued.

20th. The patient slept all night without interruption, and this morning his pulse was down to 86, it is soft, yet not feeble; his tongue is clean, the thirst nearly gone, and his bowels gently moved, and urine passes in full complement; he took his breakfast with appetite. I let down the side of the box and soaked up purulent matter, which freely escaped from the wounds; placed dry linen over the pads on either side, but did not lift or disturb it from the surface upon which it rested.

29th. Since last report everything has progressed in the most favourable way; a slight fulness was perceptible towards the inner side of the lower third of the thigh; this, however, was effectually controlled after fifty-six hours' pressure of well-applied graduated compresses, gently directing the discharge from behind forward. The transverse wound is now quite healed, and the lateral ones discharging pus freely, which I cautiously removed each day as already specified, without lifting the limb.

May 5th. This day, for the first time since the operation, I lifted the limb from the box (twenty days after the operation), the anterior splint being firmly held to the limb by assistants, or rather the limb up to it; and renewed all the dressings. No soreness or excoriation of the posterior surface of the buttock, thigh, or back, neither was there any pointing of matter backwards, the lateral incisions affording a ready outlet for it as quickly as it might be secreted.

May 6th. Discharge greatly diminished; wounds quickly closing in; no pain; sleeps without an opiate now, and no tendency whatever to spasm; he eats and drinks freely. Removed to a fresh bed.

June 1st. Ever since last report gradually and steadily proceeding. The discharge has become very much diminished, and the lateral wounds contracted considerably; pressure on the patella gives no pain, and but little pus is forced out by pressure upon it; the leg and thigh are becoming rigidly connected; and pressure on the heel does not in the least degree elicit pain, a sufficient evidence that the change brought about at their junction is a healthy process.

It is unnecessary to continue the daily report: both the careful dressing of the part, the mode of treatment pursued upon the limb, and the dietetic rules prescribed continued to be the same, with but little alteration, up to July 2nd. At this period

a small abscess formed just below the patella; from it matter could be pressed out through the external lateral wound, but I cut short its route, and passed a knife into the abscess perpendicular to the surface; this allowed immediate exit to the contents, and at once almost the propriety of the measure was borne testimony to by the quick consolidation of the parts around, and the total dispersion of œdema and swelling. Now so healthily did the repair go on, and so effectually between the divided bones, that the patient could lift the limb *en masse* from the bed without the least fear. No yielding of the parts was consequent upon this trial, nay more, on taking the limb between the hands and moving the leg and thigh in a contrary direction, antero-posteriorly or laterally, not the least motion was produced between them, an efficient test of the stoutness and integrity of the combining medium, the bond of union. Shortly after this an abscess and sinus formed above the patella, and to the inner side, over the sheath of the vessels in Hunter's canal, the contents from it could be gently pressed towards the internal lateral wound, and thus a ready outlet afforded for its discharge; pads, compresses, and well-applied, broad, adhesive straps obliterated it in a short time with accuracy and precision. The thickening of the parts around, particularly in the vicinity of the patella, was quickly reduced by suitable bandaging from the toes towards the knee, and from the groin downwards, both meeting around and supporting the newly applied and engrafted parts. After each dressing of the limb it was again steadily fixed in my fracture-box.

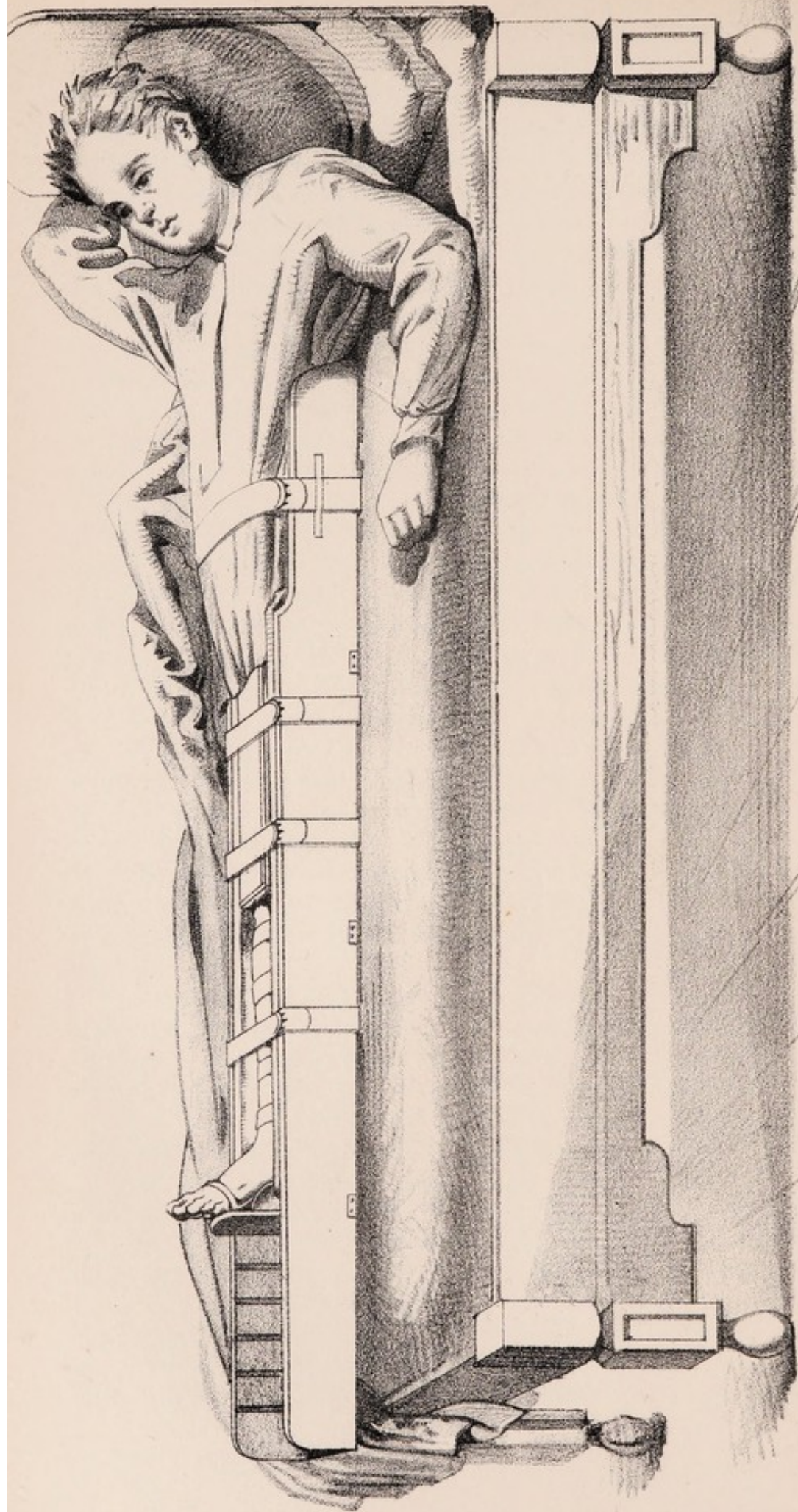
The review of this case from first to last is most pleasing,—from the beginning to the end there was never any alarming symptom. I attribute the favourable issue to the following causes:—

1st. The judicious selection of the case. For, though the joint was irretrievably destroyed, past all hopes of repair, yet the bones were not diseased beyond their articulating surfaces, therefore too large a quantity had not to be cut away.

2nd. The operation was expeditiously done under chloroform; therefore comparatively little shock.

3rd. There was no hemorrhage; no persistent weeping from the wound permitted; therefore but little exhaustion.

4th. The wound being dressed in a special manner, the limb was at once placed in the box, which I have here figured, and the adjusted bones restrained from the slightest deviation forwards, backwards, inwards, or outwards. Moreover, by the adaptation of the foot-board, the leg was kept fairly pressed up against the thigh, which in its turn was sus-



Fenster & Co Lith. Dublin.

tained in a contrary direction by the weight of the trunk, the proper axis being secured by the long arm of the splint resting parallel to and against the body. Now it should be borne in mind that this portion of the splint was not as yet lashed to the trunk by the web-girth, because during all this mechanical appliance the patient was insensible, under the influence of chloroform, and any pressure on the chest, so as to interfere with respiration during this tranquil sleep, not only would have been injudicious, but highly dangerous.

5th. The position of the wounds, each lateral one being placed well back towards the popliteal space, thus readily allowing a free exit for all secretions, and effectually guarding against all pouching in the ham.

6th. The quietude, the repose in which the limb was suffered to remain for several days after the operation,—the long period of three weeks having elapsed before it was gently and steadily lifted, after the manner described, from its bed; though prior to this time on several occasions the discharge was readily soaked up, without the slightest disturbance of the member, owing to the construction of the box. From the great facility afforded by it in the management of these cases, I shall offer no apology for representing it here. In my former essays I have dwelt upon its advantages, as well as alluded to it in the management of the case under consideration; its construction and its application having been so often alluded to, it is quite unnecessary to particularize them again. The sketch from which the lithograph has been taken was made by the able artist, Mr. Forster of Crow-street, and the entire character of the representation of my patient as he lay with this mechanical appliance upon him has been most faithfully portrayed.

7th. The full exhibition of opium during those days when wicked irritation might have been anticipated; the due exhibition of stimulants and nutritive diet, from the moment that the stomach would tolerate them at all to the termination of the cure.

The condition of the man at present (11th September) is all that can be desired: long since the box has been laid aside, and the limb is steadied by the application of a splint behind, as in my former case; the bones seem to be grown into each other; there is not the slightest yielding or motion between; it is a permanent union, and resists shocks; the most forcible percussion at the heel neither elicits pain nor motion; the patient is able to rotate the limb from the hip inwards and outwards, flex and extend it with ease and confidence. There

is a slight discharge from the wound on the inner side still, but this I have rather solicited, keeping it open as a drain by which any secretion, either of pus or serum, might readily escape. I have not permitted the man yet to walk upon the limb, though I have no doubt he could do so, and indeed he feels that he could do so if he tried; he lies upon the outside of the bed with his clothes on, and in a few days he will be walking about. The motions of the hip and ankle-joints remain as flexible as before the operation. The subject of these remarks is now as robust and as strong-looking as any man to be seen, and on contrasting the limbs as they rest side by side the amount of shortening is but very trivial. The degree of emaciation is not so characteristic now as before the operation. On the whole, the case is one with which I feel very deeply satisfied. I have casts taken before the operation, and recently since the man was cured; I also have preserved the portions of bone cut out; and all are lodged in my private collection.

CASE II.—*Excision of a large necrosed part of the Femur, together with carious portions of the bone in its vicinity, and close down even to the articular surface; Recovery with an admirable Limb.*

Patrick Bourke, aged forty-six years, a powerfully framed labouring man, admitted into Mercer's Hospital, December 19, 1856. When eight years of age he got a severe hurt in the right knee, which was followed by very acute inflammation and confinement for a considerable time. After a tedious process he was restored, with a slightly contracted state of the hamstring tendons. He recovered in this way, and remained free from annoyance, being able to walk long distances without either pain or consequent suffering of any kind. Eleven months before the above date he got "a blow of a stone" on the outside of the lower end of the right femur, a little above the knee, and from the effects of this he was laid up in one of the poorhouses for a period of seven weeks; at the end of this time he was dismissed, and struggled on, suffering great hardships and privations from poverty, owing to the useless condition of his limb: ultimately his sufferings were so great, and his capacity for doing anything so uncertain, that he sought surgical assistance in hospital, May 1, 1856. Previous to this, abscesses had formed on the inside and outside of the joint, and burst, and pus flowed freely even a very short time before his admission on the latter date. Soon the opening on the inner side healed, but the external continued to discharge through the aperture; naked bone could be felt; rest and

quietude and suitable management allayed the inflammation, and he returned home about the middle of June. However, in a short time his quietude was broken, and his sufferings were greatly augmented, so that he came to Dublin and placed himself under my care. At the time when I received him into the house, he was quite unable to walk or rest the limb upon the ground, owing to the sharp tensive pain above the joint; by the aid of a crutch and stick he was alone enabled to move, and it was a sad sight to witness the efforts which he was compelled to make to drag himself along.

He was greatly emaciated; sweating and loss of appetite enfeebled him, while a profuse sanious discharge escaped from the part, characterized by intolerable fetor. The aperture by which this fluid flowed was situated about three inches above the articulation, and on the outer side of the limb; it was a puckered fistulous track, upon which pressure made but little effect; the structures around it were dense, elastic, discoloured, and strained. On introducing a probe I quickly came upon diseased bone; the instrument, as it were, went all through a roughened osseous aperture, and deeper again struck upon an irregular sharpened piece, projecting towards the upper angle of the popliteal space. The probe being curved, and again passed in rotatory movement, made its point traverse freely in at least two-thirds of a circle, proving that a cavity within the irregular osseous entrance absolutely existed, and that the interior of the femur at its expansion was in a state of advanced decay. The limb, in its lower third, was greatly augmented in bulk, measuring nearly twice the size of the left one.

As yet the joint was unaffected; as yet the vessels in the ham were uninjured. It appeared to me that the time had arrived when something ought to be done; when operative surgery should extend its assistance towards cutting short irritation and averting impending peril; at the same time conscientiously to guard against maiming, and endeavour to preserve a limb efficient for the purposes of progression—in a word, to guard against mutilation.

After thoughtful consideration of the case, I determined to cut down upon the part, and act according to circumstances. Thus I proceeded, and after the following manner:—On the 18th January, 1857, an incision, fully from six to eight inches in length, was made on the outside part of the lower and middle third of the thigh; it was parallel to it, the sinus marking somewhat the centre of the wound; it was laid open in its entire track; the tough and gristly texture matting the parts required

considerable pressure of the knife for its division; after a few moments the bone was laid bare, a small portion of the exterior was carious, and, as before recognised, led into a chamber of a considerable size, not only involving the lower part of the shaft, but its expansion into the condyles; a long piece of the shaft, about two inches, started downwards and backwards, and was resting against the popliteal vessels; below this the bone, as previously mentioned, was chambered out by caries. After considerable difficulty the solid displaced piece of the shaft was chiselled and prized out; the force requisite to take it from its bed was very great, so as seriously to threaten the fracture of the limb by tearing through the reparative medium abundantly thrown out on the inner side and in front of the diseased bone. However, it was fortunately removed without this casualty, and all the carious part likewise scooped out with the gouge. Let it be remembered that no bone forceps could cut through the hard piece of bone; no saw could be brought to bear upon it, and the great vessels were in immediate relation with it; therefore it was by cautiously prizing it from its position that its removal was effected. I shall remark here, that by *the free exposure of the diseased part* all the steps of the operation were with accuracy accomplished. There was a peculiar advantage in this rule as applied to this special case, for by rudeness or mismanagement on the part of the operator the great vessels behind might very easily have been injured; and particularly I may speak on the fears to be apprehended from injury to the popliteal artery, because I have been in the ward of the hospital when it gave way from the extension of ulceration in the parts around to its own coats, disintegrating its continuity, and causing copious effusion of blood. For further elucidation, I shall append the history of this case, and the way in which I tied the vessel, to these Reports in Operative Surgery.

Several branches, long inosculating ones, sent down from the external circumflex, had to be tied, both immediately after the primary incisions and after the operation was accomplished, when reaction had fully set in, and by its force projected the feebly retracted vessels. The hollow of the bone was filled up, and the edges of the wound in the soft parts kept separate with dossils of lint soaked in oil; and the entire limb steadied on a splint placed along its posterior surface, and maintained so by suitably applied bandages. Quickly after this tedious operation (through all the stages of which the patient was kept in profound sleep by chloroform) he rapidly became conscious on a discontinuance of the anæsthetic

agent. He was calm, and quite unconscious of the severity of the measures which it was imperative to put in force and to execute. On the patient being removed to bed, the entire half of the thigh and upper third of the leg were enveloped in a warm stupe-cloth, surrounded with oiled silk, and shortly after, wine and opium were freely administered until night.

I saw him at 10 o'clock P. M., and he was composed, awake, but not suffering from pain; his pulse was a little accelerated, but neither tremulous nor unsteady. On the following morning he was wonderfully quiet, free from pain, and reported as having had some refreshing sleep. He took his breakfast, and I saw him at 9 o'clock A. M.; his favourable condition greatly impressed me; ordered to be liberally fed with animal diet, wine, &c., and opium, a grain of the powder every third hour.

18th. Condition most favourable; had sleep; pulse quiet, a little accelerated; urine in full quantity, and the man desirous for food; chops, wine, punch, and opium, freely given.

25th. Going on most favourably; discharge freely established, and quite healthy; regimen and opium as before.

February 12th. Granulations abundantly filling up the chasm; the discharge healthy, indicative of their character, with the local improvement; it is the constitutional evidence of repose, with but little change, all being gradual, progressive. Things went on in a steady way to perfect reparation. On the 25th of February I have it reported that the larger cavity is filled up with firm, dense structure, to the touch elastic, springy, not prone to bleed unless undue violence be exerted; the discharge is only commensurate to the healthy granulations around, and perfecting the repairs—finishing the work.

April 14th. All nearly healed; scarcely a drop of matter; motions of the knee perfect as ever. Into the small sinus yielding the discharge, a solution of nitrate of silver was carefully injected, with the happiest result. After the third application the entire track was sealed up; granulation shot into granulation, and union perfected. A few days hence the part was skinned over, and on the 28th the man was up and walking about, with but little halt or inconvenience; assisted by a stick, he made excellent progression, though now for the first time. On the 6th of May the patient was able to walk about without any assistance from stick or crutch; he suffered no pain in any movement; and I may now refer to the condition of the joint, the motions of which were not infringed upon by the violent measures practised for the exsection of the necrosed and carious bone.

The man was discharged from the hospital with an admira-

ble limb, retaining its full length, firm and unyielding, with almost perfect motion of the knee-joint. In this instance we have portrayed a striking example of the power of conservative surgery to benefit man, when carefully applied. Emaciated in frame, broken down constitutionally by irritation, the patient must have succumbed, if the source of this pollution of the springs of life was not counteracted. One of two things presented: one of two things should be adopted, executed,—amputation of the limb, or excision of the diseased bone. The peculiarity of the case, the projecting piece of dead bone against the vessels, hastened the decision, demanded promptitude. Weight is added to this great question by the following remarkable case, which vividly rested in my memory, as a practical illustration for guidance, and which occurred in the practice of one of the most distinguished surgeons in this country. I speak of William Henry Porter, Professor of Surgery in the Royal College of Surgeons in Ireland, whose ability and whose power are fully appreciated and admitted by all. The case to which I refer is published in the former series of this Journal^a. It is headed, “Aneurism in a case of Necrosis—Death from Mortification and Hemorrhage.” A reference to the case will well repay the reader, and I would warmly commend it to his notice, particularly if he be one of those cautious inquirers after truth; and as a simple meed of justice I would record my impression of the great pathological value of every opinion given by the great surgeon to whom I refer. This I am convinced of, that the stamp of a highly cultivated and matured judgment is upon all his writings. The point to which I wish to refer is the serious consequences that may follow the dislodgment of a sequestrum from its bed. It is well illustrated in the published report by Professor Porter; the “dissection” of the case is thus given:—“On opening the popliteal space, it was found filled with thick grumous clots, extending up as high as the lower third of the femur, in contact anteriorly with the bone, and with something that appeared to be part of the sac, but whether of an aneurismal sac, or the cyst of a former abscess, could not be determined. An opening existed in the popliteal artery, a little below the spot where it enters the space. The thigh-bone was found diseased in its lower half, being considerably enlarged, its surface rough, and a large portion of the posterior popliteal aspect destroyed, so as to permit the introduction of the fingers into a large cavity within; the edges of the

^a Dublin Journal of Medical Science, vol. v. p. 190. 1834.

bone on each side of this opening were thick and very full of rough sharp points; in the upper part of the excavation the sharp point of the sequestrum was discovered, movable and accurately corresponding to the aperture in the artery, which it evidently seemed to have occasioned. The knee-joint filled with a yellowish serum, unlike ordinary synovia; its capsular ligament thickened. The cellular tissue of the entire thigh filled with a reddish serum."

In a former Number of this Journal (November, 1854), under the head of Reports in Operative Surgery, I detailed a case where I had to remove nearly half the lower jaw, owing to the sequestrum starting from its bed, and occasioning from its new position such an interference with the functions of respiration and deglutition as to endanger life. In reference to the point of fatal hemorrhage being occasioned by the irritation of carious or deadened bone, on the coats of a large blood-vessel, I shall relate one I believe to be unique in its character and details. It is the following:—

CASE III.—*Fatal Hemorrhage occurring in Psoas Abscess, from the roughened Vertebrae resting against the Cava and producing Ulceration of its Coats.*

This case was in Mercer's Hospital, under the care of my distinguished colleague, Mr. Tagert, Senior Surgeon to the institution, and occurred many years ago. I have to refer back to my case-books for its report, so far past even as 1846; but its value is not lessened, for the report is perfect. I made the post-mortem myself, and I possess very beautiful drawings and casts of the changes produced. There were many points of interest about the case, independent of its peculiar termination. The Report says:—The child was six years of age, admitted on the 26th of October, 1846; name, Anne Kelly. She had been considerably indisposed before admission; at this time there was a large swelling in the upper part of the right thigh; two inches at least intervened between the upper margin of the tumour and Poupart's ligament; the swelling presented an elastic feel, and was considered by some to be a fatty tumour; there had been no shiverings or symptoms for a superficial examination to warrant the supposition that it was an abscess; however, on an exploring needle being introduced, matter flowed, and then a free opening was made into it, and the purulent fluid escaped in large quantity. It was clear now that it came from above, and that most likely the spine diseased was the cause. Yet, on external examination, little pointed to this direction. On the 1st of November the child was covered

with a peculiar form of *miliary* eruption. I have often seen it occur since, after operation, but do not think it has been noticed by authors; it generally subsides, and quickly, after two or three days. The symptoms gradually abated until the 12th of November, when there was a profuse discharge of watery fluid, at first tinged with blood, afterwards more closely dyed with it, of a black colour; whenever the pressure was removed from the surface of the sac it rushed out with immense force; from this discharge she sunk before night. I have in my collection a beautiful cast of the limb previous to the abscess being opened. It is numbered No. 89 in the Catalogue, and this short Report attached:—"Patient, a girl aged six years, of well-marked scrofulous diathesis; fluctuation in the tumour was indistinct, and it had been mistaken for one of fatty origin; there was no constitutional symptoms indicative of the formation of matter: the diagnosis of its being abscess was arrived at from accurate palpation of the part and the most educated sense of touch." The post-mortem appearances are likewise represented in a faithfully coloured cast, taken from the parts after dissection, thus described, cast No. 94:—"Sixteen days after the sac was opened hemorrhage set in; at first the discharge was tinged with blood; in a few minutes dark blood rapidly issued from the sac through the external aperture; and in a few minutes more the child was dead. The cast shows the condition of the parts eight hours after death. The walls of the abdomen being reflected, and an incision carried through Poupart's ligament down along the thigh, as far as the junction of its lower and middle thirds, the following appearances, as presented in the cast, were observable. The peritoneal cavity contained about two ounces of watery fluid tinged with blood; the caput cæcum, and ascending colon, were lifted up from the right iliac fossa and lumbar region by a large coagulum (as seen in the cast) of dark blood, very firm to the touch; this filled the entire iliac fossa, extending upwards within an inch of the origin of the psoas muscle, and downwards along its course beneath Poupart's ligament, when it seemed to bifurcate; one branch of the coagulum passed deep with the psoas tendon, and then expanded so as to fill up the entire sac of the abscess in the thigh; the other coursed comparatively superficial, and lay to the inner side of the sartorius muscle, between it and the femoral vessels, which lay to the inner side and supported on the upper surface of the sac; this division of the clot did not pass down lower than where the sartorius crosses the thigh. The source of the bleeding was from a small ulcerated opening, not larger than the size of a goose-quill,

longer in its transverse axis, in the inferior vena cava, and placed about half an inch above the point where it receives the right iliac vein. The opening in the cava was at its posterior surface, and somewhat to the right side; it was irregular and slightly thickened; while, leading from the margins of the aperture, about four lines to either side of it, were striæ passing up and down, and confirming by their arrangement the opinion of Bichat and Meckel as to the longitudinal fibres of veins. On close inspection of the spine the intervertebral substance between the third and fourth lumbar vertebræ was entirely destroyed, and the lower margin of the body of the third, which was completely carious, projected by a sharp, rough margin, about a quarter of an inch beyond the upper surface of the body of the fourth, which, as it were, was bevilled off from behind forwards and downwards; the projecting portion rested against the vein, and, no doubt, caused the ulceration in the vessel. The piece of bone absolutely projected into it. Between the bones there was a large quantity of most offensive dark pus, which burrowed beneath the remains of the psoas and iliac muscles on the right side, making its escape in that direction. It is also curious, in connexion with this case, that such extensive disease of the spine should have escaped detection, and have given no marked evidence of its presence."

Enough then: I think I have given abundant proof why the surgeon should be apprehensive of danger when deadened bone encroaches upon the walls of even healthy vessels; and, moreover, that his judgment will often point out the propriety of removing the offending body.

In connexion with this subject I shall mention one more most remarkable case, which likewise occurred in hospital practice, where the popliteal artery gave way by slough, owing to extension of destructive inflammation from a diseased knee-joint, and in which I had to ligature the vessel.

CASE IV.—Ligature of the Popliteal Artery in a case of disease of the knee-joint, with extension of unhealthy inflammation from it to the vessel, producing sloughing of its coats and violent hemorrhage.

John Lynch, aged twenty-eight years, admitted into Mercer's Hospital, under my care, June 16, 1854. Six days before his admission he was carrying a sack of wheat, and in trying to go up a flight of steps he sank under the weight, and his limbs were violently flexed under him, the sack falling down on the left knee in this position. The man experienced great

pain at the time, and was carried home; he remained confined for some hours, but again tried to walk upon it; in twenty-four hours after the accident the joint became greatly swollen, and so painful that he could not stand at all; sleep forsook him; his appetite was gone; and he was admitted on the above date. The patient's condition was as follows:—The joint was immoderately distended with pus; great redness prevailed over and around it, particularly along its inner and anterior walls, and from these aspects extended down the leg and up the thigh; the colour was a dusky hue; there was great œdema, particularly below the articulation over the forepart and inner side of the tibia; great pain was evinced on handling the part, and deep pitting upon pressure; there was no doubt that the intense inflammatory action of the synovial membrane terminated in the secretion of pus. The lateral wall of the joint was bulged out, and the patella floating upon it. For satisfaction I introduced a grooved needle, and pus rested in it; a free opening was then made in the long axis of the joint and on its inner side, and pus and synovia escaped in abundance. The limb was steadied upon a splint, and every means adopted to support the patient and diminish irritation. On the following day the report was favourable,—that he slept well the entire night; the tongue was moist and clean, it was soft; he had no headach; the local appearances were also benefited, the swelling, redness, and œdema diminished, and the pain on handling the part greatly lessened. Owing to the constrained position, the patient was not able to pass water, so I introduced a catheter and drew off fully a pint of urine,—satisfactory evidence that the kidneys were performing their functions. The local treatment was persevered in, that is, keeping the affected joint and subjacent parts enveloped in warm stupe-cloths, with oiled silk outside them,—in other words, in an uninterrupted vapour-bath; and guarding against all motion by the application of a splint behind; the occasional application of leeches to any painful point, in relays, so as to keep up a gentle drain from the part. Mercury was given in combination with opium; the former to produce salivation, and by its salutary influence check the extension of inflammation by altering the action of the capillaries, and thus arrest the progress of ulceration in the cartilages, which there was too much evidence to doubt had already commenced. The opium was given to steady the action of the mineral, and likewise to alleviate pain, to subdue irritation, to secure sleep.

June 19th. Though he slept uninterruptedly, his pulse was feeble and intermittent; he had slight sweat; his bowels were freed three times. Some of this disturbance was traceable

to the action of the mercury, for now ptyalism was gently established. The limb was paler, not nearly so much swollen, but a fixed pain rested over the internal lateral ligament; a few leeches were put on over the affected parts, the stupor continued, &c.; large doses of quina in combination with opium were given with decided benefit. Nutriment, such as rich broths, eggs, &c., were given as rapidly as assimilated.

21st. A small abscess formed over the upper part of the tibia, which I opened, and let out about an ounce and a half of pus; tenderness over the joint greatly diminished, but deep pain, referred to the ham, which was increased upon pressure.

23rd. An alarming diffuse patch of inflammation appeared over the left chest, and a tendency to stripping over the sacrum; I applied creasote with a camel-hair brush over the chest, and the strong solution of nitrate of silver to the back. A second application of the creasote, as if by magic, arrested, removed the inflammation, and left the skin corrugated and pale.

26th. In every respect better, except the ham, where abscess evidently is forming. On this day opened another small circumscribed abscess on the inner side of the knee.

29th. Abscess in the ham perfectly developed; cut down upon it and let escape two to three ounces of pus. Medical treatment as before, and nutriment and wine as freely given as the stomach will bear.

July 6th. Suddenly a remarkable change set in: the joint swollen, with the integuments of a dusky-red colour, characterized by diffuse boggy inflammation. Pulse changed, intermittent, &c. Proposed now amputation as the only means of saving life; but it was rejected both by the patient and his friends.

7th. Matters stationary, and again pressed to remove the limb, but not consented to.

8th. The entire thigh, in its lower third, participating in the mischief, being engorged and edematous. So great was the swelling, that the thigh now measured twenty-four inches in circumference, when a corresponding measurement of the sound limb gave only sixteen.

From this period, up to the 9th, there was a manifest amendment. His sleep returned; the nausea ceased; the respiration became more steady; the pulse lost its intermission; and the tympanic belly was relieved: in short, all the constitutional derangement was mitigated in a most remarkable manner. At the same time the limb had lost much of its tension and redness, and the destruction ceased to spread.

10th. The very unusual occurrence of terrific hemorrhage

took place, when I had to tie the popliteal artery. It happened in this way:—At half-past 3 o'clock P.M. on the 10th, being summoned to the hospital previous to an operation for strangulated hernia, and being with several gentlemen in the next ward to where this man lay, suddenly the nurse screamed out that he was bleeding to death; a student, who was in the room at the time, quickly ran and seized the limb high up, making effectual pressure on the femoral artery; an assistant took his place, and I at once perceived, from the quantity of blood lost, its character, and the source from which it issued, that the popliteal artery must have given way. Under this conviction I at once proceeded to secure the artery. It was a difficult task: the patient was never taken from the bed in which he lay; he was rolled over gently upon his left side, and the inner and posterior surface of the limb exposed by an incision fully six inches in length, along the inner side of the femur in its lower part; the vessel was reached. I grasped it at the rent, and freed it extensively from the parts around; and, having done so, applied a ligature above and below the opening, the ligatures being fully two inches apart, and the object being to get, if possible, a sound portion of the vessel. All bleeding ceased immediately after this proceeding, which was perfectly effectual as an operation, for not a drop of blood flowed after the vessel was compressed in the groin, and not a teaspoonful was lost in the operation, and none flowed after the securing of the artery. Stimulants were then freely and abundantly given, with rich broths, jelly, milk, eggs, &c.,—everything most suitable towards the formation of blood. He rallied wonderfully after the great loss, so much so that in an hour his pulse was considerable; heat was generated, and I looked for his recovery by care and management. The shock of the rapid though short hemorrhage, was too much for a habit already worn out by irritation, &c.; and though he rallied, it was only like the brilliant transitory flickering of a lamp before it finally goes out. He died eleven hours after, though not a teaspoonful of blood was lost after surgical interference had staunched the flow.

On post-mortem examination and careful inspection of the parts, the joint was found opened up behind, with the results of ulceration destroying all in its track; not sparing the cartilages within, it seized upon the fibrous textures behind, and involved the artery in its destructive course, and thus the hemorrhage; the coats of the vessel had absolutely sloughed to the size of a pea, a portion of the circumference of this killed part was being dilated, and thus the rent created that yielded

the alarming and fatal bleeding. It was now rendered manifest that amputation at the time recommended and pressed for was the only chance of safety. The entire joint was disorganized, its cartilages eaten away; gangrene of the tissues around. Excision of the joint would have been hopeless; amputation dexterously performed, even at this late time, might have saved the man.

That the free incision into a joint, when suppuration is established within, is an admirable practice, *in many cases, I have no doubt*; and though in the previous one it did not arrest the destructive mischief, yet I have seen enough of it to be convinced that it is an expedient most suitable, and to be extolled; it has its place,—so has excision, and so has amputation. On the judgment of the surgeon will rest the applicability of one or the other. As an evidence of the advantages to be derived from free incision of a joint which has suppurated, I shall relate the following case, and dwell upon its successful issue.

CASE V.—*Severe Wrench of the Ankle-Joint, terminating in suppuration within its cavity, and associated with diffuse inflammation extending even as high as the knee, treated successfully by free incision.*

Myles Tobin, aged eighteen years, was admitted to Mercer's Hospital, June 14, 1855. When running in a field, his right foot got entangled in a hole in the ground, and he fell sideways, twisting violently the right ankle; he nearly fainted, the pain was so acute, yet on the foot being pulled, and having rested for a time, he was enabled with assistance to walk home, a distance of fully a mile and a half. On the following morning the joint was stiff, but he again went out, being carried on a car; soon he got down and made the effort to walk, but was suddenly seized with "a terrible pain" in the joint, and fell to the ground,—so acute was it in its nature that he screamed loudly with his suffering, and had to be conveyed home. Two days elapsed before being brought to hospital, during which time stupes, rest, and aperient medicine, were had recourse to; and on the above date he was admitted, as follows:—The entire foot greatly swollen, intensely red, and severe pain on the slightest motion, referred to the tibio-tarsal articulation. The poor young man cried hysterically, being pale and worn out from want of sleep and food. A number of leeches were placed about the joint, stupes applied, a calomel bolus given, and a full opiate at night.

15th. No relief; and the joint being puffed out conside-

rably from the formation of matter, I laid it open freely in front, and nearly a pint of pus flowed away. My able colleague, Mr. Tagert, was standing by, and approved of the practice, after which the limb was steadied in a fracture-box, and the part surrounded with warm stupe-cloths. Patient slept soon after for six hours without awaking.

On the 18th matter formed above the joint, in front of the tendo Achillis; I cut down upon it, dividing the layers of fascia, and liberated it; great relief followed almost immediately; opiates freely administered, stimulants, and support.

It was very remarkable in this case how rapidly abscesses formed all through the limb; the one that I had just opened was found to extend absolutely as high as the knee-joint. By properly applied pressure with pads and bandages from above downward, it discharged its contents through the opening which I had made nearly twelve inches lower down, proving at once the rapidity with which disintegration of tissues takes place in such cases, and the urgent requirement of early and free incisions.

13th. An abscess formed on the dorsum of the foot, which I freely opened: and it is worthy of remark in the management of these cases in my hands, that I do not disturb the pads, bandages, &c., for several days, always allowing a free exit for any discharge, the apertures made by the surgeon or otherwise being invariably left uncovered, and thus the secreted fluids allowed to drain off.

19th. The case appeared very unpromising, and amputation loomed in the distance, yet I persevered, and on the 30th the report states that he went on improving: all sinuses healed, abscesses shut up, and the discharge from the joint incision very trifling. Constitutional irritation allayed; he sleeps and eats, and is getting fat.

August 11th. Wound in ankle-joint all healed up, as also the lengthened sinuses and abscesses throughout the limb; gentle motion of the ankle-joint has been persevered in for the last few days, and it is astonishing how nearly it has been restored to its perfect functions.

On the 28th of October he left the hospital, able to walk upon the limb, without either halt or impediment. More than two years have now passed by, and I may mention that a few days since I have seen the young man, and he is working at his trade, without either halt or impediment.

CASE VI.—*Excision of a large portion of the anterior wall and sides of the Tibia in its upper third, close to the articulation. Recovery with an admirable limb.*

The following is the history of a case in which I cut out a large portion of the upper third of the tibia, that is, in its anterior wall and sides, saving the healthy articular surface of the bone, and preserving a limb free from *mutilation or deformity*. The patient was a young gentleman aged 20, who for some time in London lived rather irregularly, contracted venereal, and shattered his health. Two years previous to his application to me he had marked secondary and tertiary symptoms, sore throat, pains in the bones, &c.; though his annoyances were very great, his chief one centered in an enlargement and abscess on the forepart of the right leg in its upper third; an abscess formed here, and it burst, discharging matter and blood. This crisis did not check the mischief, for an abscess formed in the ham, and became diffused throughout the limb. In July, 1856, he was brought up to town for my advice, amputation being spoken of as the only chance of saving life; the friends, however, would not submit, and they removed him to Dublin. When called in at this time his health was terribly broken up; pulse 125; he had no sleep; no appetite, and constant sweats,—in a word, he was reduced to the lowest state. The condition of the limb was as follows:—The upper part of the tibia was greatly expanded; the knee buried in swelling, or, in other words, its outlines destroyed; matter filled the ham, and extended to some distance up the thigh and down the leg; there was great tension of the parts, and the lower portion of the leg and foot were swollen with œdema; an opening corresponded to the most prominent part of the expansion of the tibia, and from the irregular aperture streamed out most offensive copious sanies. On introducing a probe, diseased crumbling bone could be detected, at least two inches deep, and about three inches below the upper articular surface of the tibia; the knee-joint was not involved, though all the soft parts around it were thickened and matted together.

The treatment I adopted at this period was the following:—Free division of the soft parts over the bone, to relieve tension; free division of the fascia; closing in the popliteal space, to allow the free exit of matter; compresses and bandages were applied so as to obliterate the several sinuses. Bark and acids, and opiates, were given to improve the appetite, to check sweats, to allay irritation, and procure rest; after-

wards, full doses of iodide of potassium and cod-liver oil. The most nutritive diet, fresh animal food and wine, was freely given; and at the end of eight weeks his condition was so much improved, and his limb so altered for the better, that I sent him back to the country to pursue the same constitutional treatment; and, putting off for the time any operative interference with the diseased bone, I argued that, when all irritation had been subdued, now that all the sinuses in the ham and leg were obliterated, the change to the country air, &c., would hasten his amendment, and render him in that state best fitted to undergo any operation I might think expedient. According to my wishes in every way, these directions were carried out. The young man returned to the country; for a time he rapidly and in a marked way improved; but soon this salutary effect was checked; he ceased to be benefited; his general health began again to suffer, and he was brought up to town.

On the 20th of January, having made a very careful examination of the case, I decided upon cutting out the carious part of the tibia; it was limited to the upper third of the bone, and extended to within about three-quarters of an inch of the articulation; the motions of the knee were perfect, being greatly restored since the period of my former attendance. On introducing a curved probe through the aperture in the tibia, it moved up and down freely; the bone broke down readily on its application; the entire circumference of it was greatly expanded, and the interior was hollowed and softened. I decided on excising all the diseased part, and in consultation Mr. Cusack agreed with me in the propriety of the measure; and on the 23rd I executed it in the following way, assisted by him, Dr. Bevan, and others:—The patient being fully under the influence of chloroform, the soft parts over the diseased bone were freely incised in the long axis of the limb to about six inches; they were freed from the bone, and drawn by retractors to either side; the carious and expanded bone was trephined in two places, at a distance of three inches from each other, and the intervening piece chiselled away with gouge and mallet; so likewise was the interior cut out, upwards, close to the articulating surface, and downwards for about three inches; the posterior surface of the bone was hard and firm, and healthy, while the anterior part and sides were softened, carious, and diseased; thus the posterior wall of the bone preserved its length, its integrity, behind. Blood flowed at first rather freely, but soon ceased to give trouble, and the steps of the operation were conducted steadily and considerately. All

the diseased part being taken away, the wound was dressed from the bottom with lint soaked in oil; the patient was replaced in bed, the limb resting upon its outside on pillows; the entire knee-joint and two middle thirds of the leg were enveloped in warm stupe clothes, surrounded with oiled silk; shortly after, wine was administered, and a full opiate given. At 11 o'clock P.M. he was lying composed, not suffering pain; he had some quiet sleep, and had partaken of light food.

26th. He slept well all night, and took his breakfast with relish. I removed the lint from the wound, suppuration being established; going on most favourably. It is unnecessary to dwell upon the daily report of this case; as, from the time of the operation up to the present (August) it has progressed most favourably; granulations sprung up freely from the cut-out hollowed parts; they assumed a more firm character, and now the entire chasm is nearly filled up with solid dense structure. A small portion remains open above, which as yet has not been incorporated in this solid bond; it yields a discharge, but so trifling as to give little annoyance, and so manageable as to be dressed by the patient himself. No doubt, a lengthened time has passed over (several months); but what is the condition of the patient now? what has been gained? Why, from being a puny, miserable, dying young man, emaciated to an extreme degree, he is grown into a large, powerful man, his limbs and body so augmented in dimensions, that all his former clothes had to be thrown aside, discarded. His countenance is changed from a sinking, haggard expression, to one of joyous health and satisfaction. The limb, from being a wasted, discoloured appendage, misshapen with œdema, is now well-formed, solid, and keeping pace in bulk with the sound one. No more sinuses, no more fetid, stinking discharges, no more fear in its movements, but, on the other hand, all the watchfulness of the patient is required to prevent, at an unguarded moment, his standing upon it. There is an innate consciousness, appreciated by the mind, that the part is capable of performing its functions in progression; indeed, he has tested it in this way and it was efficient; however, for the present I have prohibited using the limb, or making any attempt to walk upon it, and shall do so until all be permanently healed. The functions of the knee-joint are preserved in all their integrity, and the motions of the hip and ankle are as perfect as ever. This young man moves about

with great facility by the aid of crutches, and he is threatening every day to throw them aside altogether.

The operative measures adopted in this case were perfectly consonant with the improvements of modern surgery, and the issue of the case, so far as it has been revealed, is most instructive and encouraging.
