Thesis

on

Excision of the Rner.

by

J. Howells, M.R.C.S., A.H.C. &c

June 1866.
Excision of the Knee Joint.

Much has been written, and much will probably be written on this subject. Surgeons of the very highest eminence have entertained diametrically opposite views as to the advisability or non-advisability of performing this operation. Excision of the Knee-Joint, when involved in disease or injury, is comparatively a modern operation. Surgeons still look upon excision of this important joint of the body with doubt and dislike. But when it may be asked, did any operation in Surgery receive implicit faith when it was first introduced, or indeed when it was
any new method of Diagnosis or Treatment of disease received with favour when it was first proposed. There are always those who will cry out that the new-fangled methods are not nearly so good as the old fashioned ones; but on many occasions these objectors to the new thing omit to state the reasons of the belief that is in them.

All the great discoverers and inventors have been slighted at first. Nobody for a long time thought anything of the Steam Engine, and who believed in the Electric Telegraph? Cotton Looms were voted absurd, and the man who speculated on the probability of travelling fifty miles an hour was thought a confirmed lunatic. In the Medical Profession discoverers and inventors are spoken
of and treated much in the same manner as those in the other departments of Science. Harvey was considered a visionary when he stated that he had discovered that the blood went a continual round through the system while the "sidal spark" remained in the body; and Jenner, when he found that Small Pox might be rendered harmless, if not prevented altogether, was looked upon as a quack. But the opposition with which new theories and plans are met at their birth does not prevent certain gifted ones from bringing forth the said new theories and plans; and though no doubt Mr. Filkin of Norwich may have anticipated a storm of abuse and invective yet did he not shrink, but was the first to perform the operation
of excision of the Knee-Joint in the year 1762.

It was in a case of extensive disease of the articulation arising from an accident, many years previously, in which the patient had fractured his patella. The result of this case was exceedingly satisfactory, as twenty years afterwards the patient was alive and well, and, what is more, in possession of a very useful limb. Med. Jour. Lond. Vol. XI.

This then affords proof of the first performance of this operation, and also shows that a British Surgeon was the enterprising one.

It is to Henry Park, a Surgeon in the Liverpool Hospital, that is due the merit of having clearly and practi-
cally shown the feasibility and advantage of removing the Knee-joint, when diseased. He writes: "by the total extirpation of the articulation, or the entire removal of the extremities which form the joint, with the whole, or as much as possible, of the capsular ligament, thereby obtaining a cure by means of callus, or by uniting the femur and tibia into one bone without a moveable articulation."

This was Henry Park's idea of the treatment of incurably diseased Knee-joints. He carried his idea of treatment out on a sailor, with complete success, in 1781. The patient suffered from scrofulous disease of his joint, which had lasted ten years. In 1789 this distinguished surgeon
repeated the operation. This time, however, without the success which had attended the previous trial. But death, in this instance appears to have resulted in consequence of vomiting and purging giving rise to fatal exhaustion. Nevertheless the man lived three months after the operation.

In 1892 the elder Moreau performed excision of the knee joint. The result was perfectly satisfactory as far as the operation went: the patient had firm union between the femur and tibia. Unfortunately dysentery was then a prevailing epidemic, and the unfortunate man fell a victim.

Excision of this particular joint was not again resorted to till the younger Moreau's time in 1844. This surgeon
removed the knee-joint of a person aged thirty-five. The joint had undergone considerable destruction, the bones being involved in caries. The limb was seen two years afterwards, the femur and tibia were firmly united, and the leg was found a good and useful one.

In the year 1816 Professor Roux, of Paris, resorted to the operation, but, sad to relate, the case terminated fatally on the nineteenth day after the performance of the operation.

Sir Philip Crampton was the next to take up this mode of treatment. He, in 1823, at the Meath Hospital gave the operation a fair and open trial on a patient of that institution who had suffered from disease of the joint for four years.
In two months this patient was out of bed, and in six months the femur and tibia were firmly consolidated. Three years after the leg and thigh were not wasted in the least, but the limb was considerably bowed outwards. However, the patient could "stand, and walk all day."

In the year 1829, Professor Syme of Edinburgh, having met with success in the treatment of various diseased joints by the operation of excision, removed the knee. The patient was a little girl of eight years old, and had been a sufferer for three years. Three months after the operation the child could walk, and shortly afterwards could run; the leg being two inches shorter than its fellow, but causing no inconvenience.
Professor Syme had then another case; but this was unsuccessful. Now comes a blank, and for twenty years not even to mention made in surgical works of excision of the knee-joint. It was not 1850 that this great improvement in surgery was again tried, and to Sir W. Fergusson of King's College Hospital, London, is undoubtedly due the praise for having revised an operation which has of late proved more successful in its adoption than it formerly did in the hands of bygone surgeons, and in those, perhaps, less ardent admirers of its usefulness.

Since this time (1850) this operation has been performed many times, and as more care in the selection of cases, and more care in the after treatment has
been observed, so have we been more and more successful in the treatment of diseased joints by excision at King's College Hospital.

As far as I have been enabled to ascertain by "case-books" this operation has been performed at King's College fifty-nine times since 1850, and the results in the gross are as follows. Forty-one have recovered, and eighteen have died. This gives an average of one death in 329 cases. Here there seems a great mortality, but on taking the results of amputation in the thigh, from the published accounts of the London and Paris Hospitals, we find that the mortality is 1 in 5.03. But, now the death rate in excision of the knee, owing to the better selection of cases and more enlightened treatment is much less.
at least, in Kings College Hospital; where in the last thirty-five cases there have been only six deaths. Thus we have an average of 1 in 5.83, very nearly one death only in six cases.

I leave these facts to speak for themselves.

I will now proceed to give a slight sketch of those diseases in which excision of the knee-joint is applicable.
Diseases in which excision of knee may, or may not, be applicable.

There are certain diseases, and conditions of disease of the knee joint which clearly point to operative surgical interference, and this interference to be effectual must consist of either amputation in the thigh or excision of the joint. These diseases are many and but a very slight sketch of them can be given here.

They may be divided into diseases affecting the Synovial Membrane, those affecting the Articular Cartilages, and those implicating the bones forming the joint.
I Diseases of Synovial Membrane.

This tissue is more frequently diseased than any other forming the knee joint. Inflammation of this membrane is the disease with which I would commence. Inflammatory affections may be divided into the acute and chronic forms. First: Acute inflammation, and this often arises from a blow, exposure to cold, or from a punctured or incised wound. But whatever the cause, the earliest symptoms consist of swelling of the entire joint. There is considerable pain referred often to some particular point, though paining the whole joint. Should resolution occur, it is possible that the knee may become quite well again. But very serious effects may ensue. The other tissues of the joint may become affected.
Secondarily, though at first they have only suffered sympathetically. Suppuration within the cavity is always serious, and generally arises in these cases, and when causing severe constitutional symptoms calls for a capital operation to relieve the patient.

Second: Chronic inflammation of Synovial Membrane. For a cause of this affection we often feel in vain. It arises in a slow and insidious manner. Swelling is the great sign, while pain and tenderness are often absent. The effusion which is poured out, and which occupies the joint cavity will very probably partake of the characters of pus. If this untoward result take place, then the other tissues of the joint become affected. The cartilages washed by the purulent
Serosous Chronic Synovitis.

Humours taints of the constitution are very well marked in cases of chronic inflammation of the joints. The disease once established is too often progressive, and leads to the most unfortunate results. The cartilages in time disappear, and the joint is completely destroyed, calling for some active interference of the surgeon, more especially if the constitutional symptoms run high.
Thirdly: - Pulpy degeneration of the synovial membrane. This morbid change, made so clear by Sir Benjamin Brodie, consists of the degeneration of the synovial tissue into a brown, thick, pulpy substance, intersected with white lines. As the disease progresses it involves all the tissues and structures of the joint, causing ulceration of cartilage, so called, and necrosis or caries of the bones. On an articulation becoming diseased in this way the earliest indication is the peculiar elastic feel of the swelling; which may indeed be mistaken for fluid. Then there is a constant, gnawing pain. The disease will get worse, run into suppuration, and require surgical interference.

Now with regard to disease of cartilage
II Diseases of the Cartilages.

In any case of protracted disease of the synovial membrane, the cartilages of the joint become secondarily affected. But it is necessary to notice the way in which these substances are diseased. At first it was supposed that cartilages became ulcerated. But Goodric, Toynbee, and others have shown that, owing to the mode in which articular cartilages receive their nourishment, there is no such thing as true ulceration of cartilage. The process of destruction, pathologically considered, consists in a "special granular degeneration of the component cartilage cells, and the shredding and loss of substance which obtains, is due to apparent absorption and destruction of the hyaline substance, which splits up and softens into a gelatinous and
finely molecular material." Sometimes, however, a fatty degeneration prevails. In gouty and rheumatic swellings, on the other hand, a distinctly fibrous degeneration holds sway. Now these changes taking place primarily are, according to Sir B. Brodie, the beginning of a "large proportion of the scrofulous diseases of joints. This affection arising thus is rare, but is often dependent on the previous implication of the synovial membrane or of the bone lamellae of the subjacent cancellous tissue of the femur and tibia.

Next we come to diseases of the bones forming the articulation of the Knee-Joint.
Diseases of the articular ends of the Femur & Tibia

First, there are the simple inflammatory changes taking place in the cancellated tissue of the ends of the bones; and like inflammation affecting synovial membranes may be divided into Acute and Chronic.

Acute inflammation, which may be either diffused or circumscribed is oftentimes the result of cold or injury. A portion of the bone becomes more vascular; there is pain, heat, and throbbing. The open tissue of the bone then becomes infiltrated with serum. There is stiffness and swelling of the joint. If the disease progress then necroses of the delicate bony net-work occurs. This may happen, or an abscess may form;
which may break either externally
or into the joint. Supposing some
portion of bone to die, it may
remain as an inert substance
having a regular wall around
it, or it may become separate,
and an attempt be made at
its elimination. But abscesses in
the soft parts are nearly sure to
occur, and by sinuses the effete
matters are got rid of either
externally or into the joint as before.
Severe constitutional symptoms ac-
company these changes, viz.: hectic
fever, and irritative fever.

Chronic changes in the ends
of the femur and tibia may be
also circumscribed or diffused,
and, as far as the results go may
be classed together. It seems that
the chronic form of inflammation
is more common in the adult.
The disease creeps on insidiously.
and finally causes disintegration, and the bone may die. This is more particularly the consequence of the formation of numerous small abscesses, though the change may take place without the formation of pus.

But there is besides the inflammation of the bones a tendency to the deposition tuberculous matter in the cancellated structure. This tuberculous condition may be found destroying the cancelli of the spongy ends of the tibia and femur in two distinct ways. Tubercle is deposited either in a circumscribed or diffused form, and in the acute or chronic stage.

First, with regard to the diffused form. It is not unusual to find this affection involving the bones
of children of a decidedly scrofulous constitution. It commences by a low, general inflammatory state of the open net-work of the ends of the bones. The temperature of the involved parts is increased. Edema ensues, and the cancelli become filled up with a material which is altogether the same as that deposited in the lungs in Phthisis. When the tuberculous matter has once been deposited generally through the spongy tissue, it usually causes a change in the bones. The soft spongy parts become greatly expanded, i.e. the heads of the bones, the outer lamellae become wonderfully thin. The tubercle breaks down, and abscesses and sinuses are formed.

Second. Circumscribed tuberculous disease of the articular ends
of the femur and tibia. In this limited disease the earliest changes which take place in the bone is an inflammation of a small part of it. If this continues tubercles are deposited. This is limited by inflammatory matter which are thrown out around. These circumscribed deposits of tuberculous matter may be often seen and the cause of their remaining in the crude state appears to be that the circulation of blood through the bone is cut off by the infiltration of inflammatory matter.

This is Dr. Black's theory.

Thus much for diseases which, though in their commencement often thought nothing of, are in their progress and result but too frequently a cause of the
unfortunate sufferer losing his knee joint, his limb, and in many, many instances his life.

And now, having given a most cursory glance at some of the more important diseases which may affect the great joint of the human body and in which some capital operation is required, it will be right to give some account of the reasons why, in the before mentioned diseases, it is advisable to perform excision of the knee rather than amputation in the thigh.

First, is excision a correct operation when the disease is limited to the synovial membrane, and demands complete removal from the body?

It has been urged that the synovial mischief cannot in all cases be totally removed, and that
if any be left there is not only delay in the reparative process, but danger from the disease left. But it is found that abscesses form, and this remaining part disintegrates and comes away, merely prolonging the cure. And the leaving of diseased synovial membrane is very often only dependent on the imperfect way in which the surgeon has performed the operation.

Now when the disease is strictly confined to the synovial tissue the bones are healthy, and, this membrane and the disease having been removed, only so much of the bones is required to be removed that the surfaces may come into apposition. Reparation is then immediately set up. The shortening is but slight, from union takes place, and the
operation is strictly conservative.

Of course, nothing in the way of excision should be attempted if the joint be acutely inflamed: nought but mischief can accrue from such injudicious meddling. Indeed, it may be said that the more chronic and quiet a disease is the more it is calculated for removal by excision.

The cartilages if implicated are "shredding" and undergoing disintegration laying bare the bone. This gives rise to constant gnawing pain, and starting of the joint, accompanied by severe constitutional disturbance. So great indeed is this disturbance that the patient is reduced to a very low and critical state. In the majority of cases re-
liep from the disease is quite enough to compensate for the shock of the operation. Mr. Henry Smith, of Kings College Hospital, has recently had a case of this description (but not disease of the knee). The man was very ill with disease of left lung and, so called, ulceration of the cartilages of the elbow joint. Mr. Henry Smith excised the joint; the man recovered perfectly, and even got rid of the pulmonary symptoms.

Should excision be performed when the disease implicates the bones forming the articulation? When simple inflammatory processes involved the spongy portion of one or both bones forming the knee joint, either as a primary or secondary affection the pathological changes which occur are highly favourable.
So far as regards excision; especially if that inflammation be of the tardy and chronic kind. Consolidation and compactness of the osseus structure takes the place of the open and vascular network and there is less chance of purulent infiltration after the operation.

Excision too appears well adapted for cases in which there is the chronic circumscribed inflammation leading on to suppuration. For, when the slice of bone is removed, by the aid of a gauge the cavities containing pus and disintegrated matter can be carefully scooped out, and so long as some healthy structure remains the reparative process will be set up. Care, however, must be taken in this gouging process, as I have seen a surgeon scoop
but a considerable portion of the medullary substance from the femur thinking that he had got on rather a deep abscess.

So also it appears perfectly fair and justifiable proceeding when necrosis of a portion of the articulation has taken place. Even when a large portion of the femur or tibia is diseased excision is quite feasible. I have in my mind now a case which occurred at Kings College Hospital under the care of Sir W. Ferguson, while I was housesurgeon, in which a large piece of the femur was necrosed, and removed at the time of excision of the joint. The boy made an excellent recovery, but this case will be more fully noticed afterwards.
Under the heading of Strumous or tuberculous disease of the ends of the articulating bones I would say that in the circumscribed variety there is always some thoroughly healthy portion left in the bony tissue, and as long as some healthy substance remains reparative processes will be set up. Here often only fibrous and flexible union will result, but sufficient consolidation may take place to render the limb extremely useful. Sir W. Fergusson had a case of a girl, employed as a housemaid. She fractured the joint, but no bony union resulted. However, so firm was the fibrous false joint, that the girl returned to her situation, and did her work as housemaid for a considerable period, being able to run up and down stairs.
Unfortunately one fine day she slipped (not from the bad leg but the other) and, falling severely, set up fresh mischief in the before affected limb, which became so bad that it was found necessary to amputate.

The Diffuse form of strumous infiltration is a disease in which excision can be of no service. The bone will never recover its healthy condition, and in consequence no new bone can be thrown out which may begin and continue the reparative process.

It is stated that this operation of excision even if applicable at all should only be performed in persons who have reached the adult state, as the removal
of the joint if much diseased necessitates the taking away of the epiphyses of the bone, and a non-development of the limb in consequence. This may be true if the whole of the epiphysis be removed in young children, but how often is this necessary? Indeed very seldom. In many cases at Kings College Hospital there has been only one in which removal of the epiphyses was necessary. If but a slice of the bone be taken away there is no impediment to growth, and even supposing the leg be considerably shorter than its fellow, surely a real leg and foot is far better than the joint stump in the world and a wooden-pin.

Again, it has been urged
that so long a time is required to make good the recovery.

This is indeed so in many instances, but a patient will not generally mind a few extra weeks in bed if he can preserve his limbs thereby.

But recoveries take place much sooner now than they did. No doubt partly from the care that is taken in the after-treatment. There was a case of a man who had his knee-joint excised at King's College Hospital, and was out of bed with his crutches and firm bone anchylosis between the bones in twenty-seven days.

Again, it is said, if the soft parts be implicated to a great extent the operation should not be done, but it appears in
practice that abscesses and sinuses in the soft tissues, however, great and extensive, only form channels for the due discharge of pus and effete materials, and that having fulfilled their mission they close up.

If the patient be suffering from Phthisis, acute heart disease, or any malignant affection, and where recovery is not to be hoped for then excision of the knee is useless, and the performance of it only tends to bring the operation into disrepute.
The Operation

The patient being placed on a convenient table, and chloroform having been administered, the surgeon should make a single incision running across the joint in front just below the patella. This incision should be carried well back on both the inside and outside of the joint. It was at one time deemed advisable to make an H incision, but this destroys the soft parts too much and gives rise to a great chance of sloughing. By adopting the single incision, the ligamentum patellae is divided and the joint opened. The knee is then slightly flexed by an assistant, and the surgeon carefully detests back the flaps from the femur and
tibia. The lateral ligaments are now divided, and the joint bent to an acute angle. The ends of the bones must next be freed by a sweep or two of the knife, and the saw applied. It is advisable to remove the end of the femur first. The saw that is best adapted for this is an ordinary one with a straight movable back and fine teeth. It has been customary to remove from the femur and tibia a considerable slice if the bones are diseased, viz.: an inch and a half to two inches from the former, and half an inch to three quarters from the latter. However, it is better to remove only small slices at a time from these bones, so that, if the distortion of the joint be not very great, or the disease comparatively superficial, no more bone may be taken away.
than is absolutely required, great care must be observed that in the separation of these slices of bone the surgeon does not wound the popliteal vessels. Then as much as possible of the diseased synovial membrane must be taken away with the patella. The operator should then see if by pulling the limb straight the surfaces of the femur and tibia can be placed in apposition. If not, a small piece more bone must be removed of a wedge-like shape. All heorrhage should be arrested by ligature, or otherwise, at once; for not only does the bleeding weaken the patient, but the blood getting between the bones prevents the reparative process being set up. Generally but little blood is lost during this operation, at least comparatively little; but in
Some very vascular knee joints it has been necessary to put on seven or eight ligatures. Taking care that the ends of the bones are in good apposition the surgeon then puts in a few sutures and the limb is then carefully strapped and bandaged to a straight "excision-splint." Net dressings applied to the wound and the patient removed to bed where the leg is swung in one of Saltir's swing cradles.

**After Treatment.**

It seems to be of great importance to put the limb up on a splint as soon as the operation is completed. The limb is kept steady from the first and the patient has not to undergo what is, to him at least, another operation
in the placing of the leg in position. For some time, (twelve hours or even more) after the performance of the operation the patient will most likely be in considerable pain. Opium will be effectual in quieting him, and in preventing the leg starting. He will require stimulants which should be given judiciously, and the best of which are Brandy, Brandy and Egg mixture, and Chloric Ether. Good nourishing food also must be afforded as the case progresses.

But the great thing in this after treatment of excised Knee joints is to keep the limb at perfect rest, and in good position. In some cases I have seen the Splint put on in the operating theatre and never once removed till the patient has been able to
dispense with it. If, however, the splint must be changed, then have a similar one padded ready, and let the limb be carefully transferred from the old one to the new. Sometimes great difficulty occurs in preventing the femur from “riding.” This I think is best combatted by placing pads under the head of the tibia, and not by attempting to force down the head of the femur. So too the femur has a great tendency in many instances to rotate outwards, and the leg to become bowed out at the solution of continuity. This is best remedied by having a straight, interrupted side splint to hook on to the excision splint, and, by means of pads and strapping, the position of the leg may be kept right. But this requires
great care and watching, and some part of the apparatus will frequently want looking to every day.

Causes of death after Excision:

Taking all cases which have been operated upon since the time when excision was first practised (1762) to 1860.

<table>
<thead>
<tr>
<th>From</th>
<th>No. Operated</th>
<th>Cured</th>
<th>Died</th>
</tr>
</thead>
<tbody>
<tr>
<td>1762-1830</td>
<td>17</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>1830-1849</td>
<td>9</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>1850-60 (Continent)</td>
<td>21</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>1850-60 (British)</td>
<td>238</td>
<td>183</td>
<td>55</td>
</tr>
<tr>
<td>1862-60 (American)</td>
<td>6</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>291</strong></td>
<td><strong>213</strong></td>
<td><strong>78</strong></td>
</tr>
</tbody>
</table>

Now the causes of death in these fifty-five cases were as follows:
<table>
<thead>
<tr>
<th>Causes of death</th>
<th>No. of instances</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Exhaustion &amp;</td>
<td>14</td>
</tr>
<tr>
<td>2. Pyemia</td>
<td>10</td>
</tr>
<tr>
<td>3. Phthisis</td>
<td>5</td>
</tr>
<tr>
<td>4. Irritation, hectic.</td>
<td></td>
</tr>
<tr>
<td>5. Secondary hemorrhage</td>
<td>5</td>
</tr>
<tr>
<td>6. Shock</td>
<td>6</td>
</tr>
<tr>
<td>7. Uncertain causes</td>
<td>4</td>
</tr>
<tr>
<td>8. Chloroform &amp; shock</td>
<td>3</td>
</tr>
<tr>
<td>9. Fleurisy</td>
<td>1</td>
</tr>
<tr>
<td>10. Fleuro-pneumonia</td>
<td>1</td>
</tr>
<tr>
<td>11. Suppression of urine</td>
<td>1</td>
</tr>
<tr>
<td>12. Dysentery</td>
<td>1</td>
</tr>
<tr>
<td>13. Diarrhoea</td>
<td>1</td>
</tr>
<tr>
<td>14. Anemia</td>
<td>1</td>
</tr>
<tr>
<td>15. Erysipelas</td>
<td>1</td>
</tr>
<tr>
<td>16. Peritonitis</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>This giving sixteen causes &amp;</td>
<td></td>
</tr>
<tr>
<td>86 deaths</td>
<td></td>
</tr>
</tbody>
</table>
Cases at Kings College Hospital.

The following are some of the numerous cases which we have had, and are taken from the "case books" of the surgeons, which cases have been more or less under my charge.


Under the care of Sir William Ferguson.

James Hughes, 8 years, admitted into No. III Ward on 4th July 1863, with disease of left knee joint. Twelve months ago he broke his left femur and six months later he broke it again. He remained in bed three months, and then the left knee became gradually swollen and painful. It was put on a splint, and the boy took steel and Godfrey's oil, the joint was blistered several times. He remained under treatment till 23rd May 1863.
when the joint was still painful, swollen, and evidently contained fluid. 23rd May the knee was excised. The disease was of a serofabous nature: the synovial membrane thickened and softened, the cartilages broken through, and some parts of the bones diseased.

For the first fortnight after the operation, the lad made but little progress, the pulse ranging from 120 to 140, while there was occasional vomiting, and unhealthy discharge from the wound. But between this time and June 11th he improved much, and the wound put on a healthy appearance; and the patient became able to eat and sleep well. June 29th a small abscess has formed and been opened over the head of the tibia. Abscess continues to discharge. Sir William Fergusson, suspecting dead bone, enlarged the opening 25th July,
and removed about an inch of the femur and a considerable slice of the end of the tibia. From this time the boy progressed favourably.

The splint was removed 1st August and a "gutta-percha" one moulded to the limb. He was discharged on 18th December 1863 quite well. No bony union had then taken place. But the limb has grown and strengthened considerably since and union is now perfect (1865).

Now in this case we see a most successful instance of excision in the end. Its only drawback is the time the patient took getting well. But how often is it the case that bone exfoliates after amputation in the thigh, and not only prevents the sufferer wearing an artificial limb, but effectually "lays him up."
No. 2. Case Book XXII. p. 41.

Under the care of Sir William Ferguson.

Charles Cairns, at 24 years was admitted on 7th July 1863, with disease, apparently of synovial membrane. He is a sail-maker.

For the last ten years has limped slightly in his gait. This did not trouble him much until two years ago, when he fell on the left knee. This injury was followed by considerable swelling of, and slight pain in, the joint. Nine months ago after getting very wet, the knee became much worse, and it has been becoming still worse and worse till admission as above.

The left knee is much swollen and very painful at times; the tibia is apparently dislocated backwards, and the limb bent. Small sinus exists at the upper and outer part of the joint which discharges.
July 11th the operation of excision was performed. The joint was quite disorganized, the disease was of a stramous character. A considerable portion of the articular ends of the bones was removed to obtain true apposition, as the muscles at the back of the limb were very much contracted.

July 27th. Wound healthy and healing. Bones in good position. He went on most favourably, and was discharged 23rd September, perfectly cured. The wound was healed, and no ankylosis firmly established between the bones. The limb was one inch only shorter than its fellow.

This is a very good case, the patient seemed to improve day by day. His system seemed greatly relieved by the removal of the disease. The prognosis was favourable. too, inasmuch as the disease was
very chronic. In less than eleven
weeks the man was quite well.

Under the care of Mr. Henry Smith.

George Fairby, at 6 years was
admitted into The "Female Surgical"
ward on 23rd September 1864 with
disease of left knee.

About five months before admission
his knee was noticed to be swollen
and very red. Thus it remained
until three weeks ago, when an
opening was made, and a large
quantity of pus let out from the
outer side of the joint.

On admission, the knee was much
swollen and contracted, with a
small sinus on the outer side.

Oct. 22nd 1864. The joint was excised,
a small piece of the epiphysis of
the femur, the epiphysis of the
tibia, and patella having been removed
There was circumscribed strumous deposit in the ends of the bones, and the joint much diseased. Oct. 26th the greater part of the wound has healed by first intention, but a small portion continued to discharge till 1st Dec. There is now bony union.

February 9th 1866. Discharged. To go to a convalescent home. There is a small sinus which still discharges slightly.

This was rather a tedious case, but care and attention brought it to a satisfactory termination.


Under the care of Mr. Henry Smith. Frank Bedford, at 8 admitted 28th September 1865 with scrofulous disease of the left knee joint. The joint had been ill six years and a half. The bog is about an inch
and a half shorter than its fellow, and much wasted. It is semiflexed, partially ankylosed. The joint is very much swollen.

On 8th October Mr. Henry Smith excised the knee. The bones were a good deal infiltrated with tuberculous matter (circumscribed), so that considerable portions of the epiphyses of the femur and tibia had to be removed.

27th October. The patient has not had a bad symptom. The wound is nearly healed. Bone union has taken place.

23rd November. Allowed to get up. When standing firm on right leg, he can touch the ground with the toes of his left foot. The left leg is very firm and strong, perfect ankylosis having taken place.

29th November, 1865. Discharged cured.
Here we have a case coming in on 28th September, and going out cured of his disease with a useful limb on 29th November, just two months from the time of admission. The disease of the joint was severe, and the patient not a particularly good subject for any operation one would have thought. In very few instances are there cases of amputations of the thigh getting well so soon as this. Mr. Smith has seen the boy at intervals and the limb still continues straight and firm.


Under the case of Mr. Henry Smith, Mary Bartlett, at 30 admitted September 6th, 1865.

About nine months ago she noticed slight pain and swelling on the inner
Side of the right knee joint. In the course of the next six months the joint became more swollen and painful. General health very bad. On admission the joint was found to be greatly enlarged and very painful, particularly at night. The limb was swung in one of Potter's swing cradles, and the patient's strength supported. She much improved by having perfect rest and receiving good nourishment. Improved so much was the patient that it was determined to operate.

Oct. 21st. The joint was excised. The whole of the condyles of the femur and about half an inch of the head of the tibia were removed, owing to extensive disease of the bones, the cartilages were elevated, and the Synovial membrane in a state of degeneration.

Oct. 26th. Has had no bad symptoms, saving a little sickness after the
operation and restlessness. There is a little puffiness in front of the joint. It was examined, and found owing to the riding of the lower end of the femur. It was immediately placed in position, chloroform having been administered to the patient.

Oct. 30th. Had this morning distinct rigors.

The poor woman gradually sank from this date, and died with all the symptoms of pyemia poisoning on 9th November 1865.

Why this case should have turned out so unfortunately who can say? The patient when the operation was performed seemed in a very fair state, as far as her general health went, and was most anxious that something should be done to relieve her. No examination of the body could be obtained, the friends objecting.

Under the care of Mr. Henry Smith.

Martha Ledger, 51, admitted
2nd April 1866.

Nineteen years ago she hurt her knee by kneeling down quickly on a hard stone. Two or three months after this occurrence, the knee became stiff and swollen, and from that time until the present, the joint has gradually become worse.

19th April. Excision was performed. The whole of the synovial membrane was found to have undergone gelatinous degeneration, and the whole joint to have become disorganised.

For the first few days the patient did not seem to rally from the "shock," and was so constantly sick that nourishment was administered by the rectum. However, these bad
symptoms soon passed off, and the patient began to get stronger. I saw her on 28th May, when she expressed herself as feeling very comfortable. There is a very good union between the bones.

Under the care of Mr. Henry Smith, William Hicks, 50, a marine (discharged the service) admitted 27th December 1865.
In the summer of 1860 he noticed his left knee was stiff.
About eighteen months later several abscesses formed about the joint, and were opened. Since then the joint has remained quite stiff.
On admission. The left knee joint is ankylosed, the tibia appears to be dislocated backwards. There is only slight pain in the articu-
lation, and the limb is semiflexed.

6th January 1866. Mr. Haens Smith excised the knee-joint.

A wedge shaped piece of bone had to be removed. The disease appeared to be chiefly seated in the synovial membrane. The ends of the femur and tibia were brought into opposition.

The man on recovering from the effects of chloroform stated to me that he felt very comfortable and had but little pain.

There were no bad symptoms, and on 18th January there was evident union of the bones.

On 30th of the same month the excision splint was removed and a simple, straight, back splint applied.

9th February. The patient up and about on crutches. The union of bone quite firm.
February 21st. Discharged.

The leg is quite straight, and the union complete. He can bear a moderate amount of pressure on it.

This case of excision was one of the best that I have seen. In forty-six days after the operation the patient was not only fit to leave the hospital but could bear on the affected limb. He heard of him two months after he had been discharged, and he was then able to walk ten miles.

In this instance there was very little shock, and no constitutional disturbance. The patient's pulse never rose above 80. His tongue remained clean. He had no pain. The excision splint was not moved till union had occurred. Altogether it is a most satisfactory case.

Under care of Sir William Ferguson. John Wells, at 14 admitted into King's College Hospital 16th Nov. 1865. Is a farmer's boy of scrofulous family. About nine months before admission he began to experience pain in right instep of a most constant kind. This was followed shortly after, by pain and swelling in right knee. The pain was very acute and lasted for six weeks, when two abscesses opened a little above the joint with immediate relief. The knee at this time was quite stiff. Small pieces of bone have been discharged at intervals from the openings above the knee.

On admission, joint much swollen and stiff, patella very slightly movable. A sinus leads to bare bone just above the outer condyle. The "hamstring" muscles contracted.
December 23rd. Sir William Ferguson made an incision three inches long, enlarging the sinus on the outer side of the limb, but was unable to extract any dead bone. The knee became worse, sinuses formed below the joint, and the general swelling increased. It was finally determined to excise the knee joint, and to extract the dead bone in this way. Accordingly, 20th March the operation was performed. A wedge-shaped piece was removed of bone together with the patella. By means of the "sequestrum forceps" a large bit of necrosed bone was removed from the femur. Some strumous material was gouged out from the head of the tibia, and the limb was then put up in the splint.

23rd March. Case progressing favourably, discharge coming away.
fully. No pain.

Case went on quite well till the 1st April when the patient was feverish, and had some shivering.

5th April. Large abscess formed on the inside of the limb about the head of the tibia. There was a good deal of swelling about the parts. The abscess was opened.

No further bad symptoms showed themselves. The swelling became less.

14th April. Splint removed for first time since operation. Union very firm, and the wounds healing fast.

18th April. A "Gutta-Percha" splint adapted to the limb. The boy was allowed to get about on crutches.

But as for the next few days the knee, or rather the place where the knee had been, became painful, the patient was again confined
to bed. Another small abscess now formed which was opened.

30th April. Perfect bony union established: the limb is just about three quarters of an inch shorter than its fellow. Boy in very good health.

To be discharged.

This case which though it, at first, promised to be a long one, if not an unsuccessful one, turned out as well as could be expected. The boy was sent up to London in order that amputation might be performed in the thigh. He has however, instead of a stump, a good and useful limb.

These, then, are some of the cases which we have had lately at Kings College Hospital, London. They are very fair
Sample of the amount of success which is obtained at the before mentioned hospital in the performance of the operation of excision of the knee-joint.

Some cases will turn out unsatisfactorily as what you will others, in spite of, apparently, the most adverse circumstances do exceedingly well.

Great care should always be taken in selecting for operation such cases only as are really fit. No good can come of excising a joint where "diffuse infiltration" has taken place for instance. Also that the patient will be able to bear the shock of the operation. It was found at Kings College Hospital that great good was obtained by the administration of the Sesqui-chloride of Iron for a week or two before the operation.
was undertaken.

When excision of this joint is more extensively practised, the proceeding will be regarded with more favour I fully believe. At present amputation in the thigh is generally preferred by the hospital surgeons of London. Science, however, slowly is advancing, and I am sure that in time excision will be, on all hands, regarded as one of the best operations of the day. Excision of the knee-joint wants trial by all, for:

"others' fiddles teach us not,
Nor much their wisdom teaches;
And most, of sterling worth, is what
Our own experience preaches."