THESIS for GRADUATION.

Peter Yates M.B. C.M. (1883).
The Infirmary
Bolton-le-Moors

April: 1886.

CONTENTS.

Introduction.

After a careful examination of the various Surgical cases, which have come under my notice in this Institution, and which might be suitable as subjects for a Graduation Thesis, it has appeared to me that for importance, frequency and complexity those cases of hip joint Disease; which call for operative interference stand second to none. I have had exceptional opportunities of studying this Disease, both in the Out-patient Department, and in the wards of this Institution, in its early stages, and in those more advanced. On account of the importance of the indications for and against operative interference in advanced hip Disease, which so frequently come before the consideration both of the hospital Surgeon and the general practitioner, I have made more particularly a study of those cases in which the operation of excision is required.
It is my object here to describe and discuss certain Cases of excision of the hip joint, which have come under my own care, and to contrast these with other published accounts.

Section I. A. Description of eight cases of Excision of the Hip, treated in the Bolton Infirmary during the years 1885., 1886., under my own observation.

Case i. Scrofulous caries of the femur: the head and articular cartilage entirely destroyed; the neck and great trochanter involved; abscess formation; of traumatic origin; Excision of head, neck and trochanters; Recovery with a freely movable and useful limb.

A. G — aet: 13 years. History. Five years before admission, she fell off a mangle, alighting on her left hip on one of the projecting screws. Severe pain and swelling followed; and subsequently suppuration occurred in the groin, which was poulticed and burst. Immediately afterwards, when allowed to get up and walk, it was noticed that she limped, and complained of stiffness & soreness about the left hip joint. The sinus which was left by the abscess in the groin, continued to discharge. Two years before admission further abscess formation occurred on the outside of the thigh, when she was admitted to the Manchester Royal Infirmary, where she remained under treatment eighteen weeks. On the 11th May 1885, she was admitted to the Bolton Infirmary.

State on admission. The girl was pale and emaciated, having an anxious expression of countenance; with a decidedly scrofulous Diathesis. The affected limb was about an inch shorter than the sound one; slightly flexed at the hip and knee and much inverted. No dislocation could be detected. There was considerable swelling about the affected hip, and on the anterior and outer aspects of the joint were two sinuses, which discharged profusely. Both the sinuses lead down to diseased bone.

Treatment and Progress. She was put on a liberal diet, tonics (iron and cod liver oil) administered, and a simple extension apparatus applied, the limb being steadied by means of sand-bags. Poultices were applied to the thigh. In spite of the tonic treatment and the maintenance of rest, the discharge did not decrease, and the child was observed to be loosing ground, so excision was determined on.

On June 26th 1885, the operation was performed. A longitudinal incision was employed on the outside of the joint, about four and a half inches in length. The head, neck and trochanters were removed. The acetabulum was examined, but found healthy. No ligatures were required, as the haemorrhage was inconsiderable.

She soon recovered from the effects of the operation, with the exception of continued sickness from the chloroform; and in a week afterwards there were decided signs of improvement in her general condition.
The temperature rose to 101° F immediately after the operation, but subsequently never got above 100°.
The wound gradually filled up with granulation tissue, the discharge becoming less and less.
On August 29th the note was "Slight movement at the hip allowed attended by no pain; allowed up; is gaining flesh daily."
On September 15th, eleven weeks after the operation, the wound was quite healed up. The sinus on the front of the thigh was however not closed, but discharging very slightly. She was now allowed to go about the ward on crutches, and could bear considerable weight on the limb without any pain. There was free movement in every direction. Her general condition of health was much improved, having become quite robust and cheerful. Discharged October 2nd 1885, 14 weeks after operation.
April 5th 1886. The child walked about a mile to come and see me. She was quite well and her general health was most satisfactory.

The sinuses about the hip had quite healed. There was free movement in the joint, and she could bear sufficient weight on the limb to enable her to walk without crutch or other support.

Case ii. Caries of femur: its head and neck involved; No acetabular disease; abscess formation about the hip; Disease of trochanteric origin; Excision of head and neck of femur; Death seven months after operation from tubercular meningitis.

J. G — aet: 4 years.

History. Six months before admission he was kicked on the right hip by a girl. About a week afterwards he began to limp and complain of severe intermittent pain in the right knee. Later he complained of deep seated pain in the thigh in the region of the great trochanter. On December 17th 1884 he was admitted to the Bolton Infirmary.

State on admission. There were, on admission, all the characteristic signs of chronic disease of the hip joint in its second stage; — almost continuous pain in the hip and knee,

flattening of the notes on the affected side, slight abduction. etc.

Treatment and Progress. He was treated at first in the usual manner by means of extension and the long splint. A liberal diet and tonics given. Three months after admission, however, an abscess formed on the outer side of the hip, accompanied by pain, necessitating the removal of the splint and extension. The abscess eventually "pointed" and it was opened with all antiseptic precautions a drainage tube being inserted into the abscess cavity. It however, got putrid, the discharge becoming very profuse and offensive. Hectic symptoms then developed and it was deemed advisable to excise the joint.

On the 24th July 1885 the operation was performed, the femur being divided at the neck. A longitudinal incision was employed on the outside of the limb. No difficulty experienced during the operation. Inconsiderable haemorrhage, no ligatures being required. No acetabular disease. An interrupted long splint applied immediately after the operation, and a small extension (3 lbs) put on

three days after the operation.
For the first fortnight the discharge was fairly copious, but after that time it got gradually less. The boy's health took a favourable turn and steadily improved.
Five months after the operation the incision was firmly healed, and he was able to get about on crutches quite well. There was free movement in the joint, and the boy was making rapid progress, when unfortunately he contracted whooping cough.
later, in the beginning of February, symptoms of tubercular meningitis developed, of which he died on the 21st of that month.
This case, therefore, cannot be regarded as a death due to the operation, as the boy had practically recovered.
The parents would not hear of a post-mortem examination being made, so I was unfortunately unable to make an examination of the newly formed hip-joint.

Case iii. Caries of femur: head, neck and great trochanter involved; Similar Disease in acetabulum, with perforation of that cavity and formation of intrapelvic abscess; Excision of head, neck, trochanter and part of the acetabulum; Continued suppuration; Still under treatment.

T. G — aet: 10 years.

History. Nine months before admission, when playing football in the school yard, he was knocked down, pitching on his left hip. The parents noticed nothing until about three weeks after the above accident it was observed that he limped in his walk. He did not complain of any pain, but his mother noticed that he occassionaley awoke up in the night with a scream. No treatment was adopted, until about a month before admission, when, owing to the occurrence of acute pain in the hip, medical assistance was called in. He was ordered to bed, and remained there until the 31st July 1885 when he was admitted to the Bolton Infirmary.

State on admission. As in the last case, there were all the characteristic signs of hip Disease in its second stage. The pain was situated on the outside of the thigh, occassionally shooting across

the thigh to the inside of the knee. It was very much aggravated by percussion over the great trochanter, and when the limb was flexed and circumducted at the hip joint.

Treatment and Progress. The usual remedies were applied at first. The splint and extension were kept on for nearly four months, but were removed at the end of that time on account of considerable swelling about the hip joint, with increased pain and elevation of temperature. No suppuration could be detected. The limb was then simply placed between two sand bags to steady it, and for a time the symptoms remained stationary.

On December 15th suppuration was detected, and, inasmuch as the boy's health was beginning to give way, and he was becoming much emaciated, it was determined to make an exploratory incision into the joint for the purpose of ascertaining the extent of the disease, and if there were suppuration within the capsule of the joint. An exploratory incision with all antiseptic precautions was, accordingly, made; a considerable quantity of thick pus being evacuated. On passing the finger into the wound it was found that the head, neck and a portion of the great trochanter

were carious, so it was deemed advisable to further proceed to excise the carious portion of the bone. This was done. On examining the acetabulum, perforation of that cavity was found to have occurred, with the formation of intra-pelvic abscess. As much of the acetabulum as could be, was removed by the "gouge". The head, neck and trochanters of the femur were removed. No ligatures required. An antiseptic (carbolic gauze) dressing was applied. No splint or extension put on until the third day after the operation.

The boy speedily recovered from the effects of the operation, and went on well for some weeks. The discharge, however, continued to be very profuse, necessitating almost daily dressings, and, moreover, the boy's health did not show any signs of improvement, as was anticipated.

April 5th 1886. Condition much the same, the discharge being rather diminished in quantity, but still very copious. In all probability the disease is spreading in the pelvic bones. Still under treatment.

Case IV. Caries of femur: head and articular cartilage entirely destroyed; neck and great trochanter involved; similar disease in acetabulum; Dislocation backwards on to dorsum ilii; abscess formation about hip; Excision of head, neck and trochanters; still under treatment, but doing well.

J. R — aet: 10 years.

History. Two years before admission, he was knocked down in a crowd, and got trampled upon. Almost immediately after, the boy was noticed by his mother to limp. Eventually, the limping got so much worse, the boy body being bent almost double, part of the weight of his body being supported by resting his hand on his knee, that a medical man was called in. On the 8th January 1885, he was admitted to the Bolton Infirmary. He then had all the characteristic symptoms of chronic hip joint disease, and was treated in the usual manner, the treatment being continued for three months. At the end of that time, the splints and extension were removed, and as all the symptoms had disappeared, a Thomas' splint was applied and he was sent off to the Cheadle Convalescent Hospital.

He was lost sight of then until in August 10th he presented himself again and was admitted.

State on admission. The limb was flexed on to the abdomen at the thigh, and much inverted, the knee of the affected limb lying over the thigh of the sound one. Dislocation backwards on to the dorsum ilii had occurred, with abscess formation about the dislocated head of the bone, but which had not burst. Shortening to the extent of 2½ inches of the affected limb. In fact, all the characteristic appearances of advanced hip disease.

Treatment and Progress. Poultices to the hip were applied. Good food and tonics. Eventually the abscess pointed and burst. On August 30th an erysipelatous inflammation of the whole limb set in, which gradually subsided under the application locally of the Tincture of the Perchloride of Iron. The discharge from the sinus, however, became much more profuse and the general health was manifestly failing.

On Nov: 17th 1885. Excision of the head, neck and trochanters was performed, the carious portion

of the acetabulum being gouged away. After the first week the general health began to improve, the discharge becoming gradually less. The pain also, which he had suffered from in the hip and knee disappeared and he has been quite free from it since.

April 2nd 1886. Wound nearly healed; still some slight discharge. General health much improved, countinance quite cheerful & he is becoming quite fat. Knocks about the ward on crutches.

Still under observation.

Case V. Caries of femur: head, neck and trochanter major involved; similar disease in the acetabulum; Dislocation back-wards on to dorsum ilii; Abscess formation; disease of traumatic origin; Excision of head, neck and trochanters; recovery with a freely movable joint.

E. K — aet: 8 years.

History. Five years before admission, she fell down stairs, alighting on her right hip. The mother didn't take much notice of the

accident at the time, but about a fortnight afterwards she noticed that the child gave way on the right side while walking. She was also observed to occasionally wake up in the middle of the night with a scream. Medical assistance was now called in, and something (probably Iodine) painted on the hip, cod liver oil administered, and confinement to bed enjoined. The treatment was continued for three months, but at the end of that time there was little improvement, and she was allowed to go about again. Twelve months after the accident, an abscess formed on the outside of the hip, was poulticed and burst, continuing to discharge profusely until her admission on 7th July 1886.

State on admission. There were all the characteristic signs of advanced hip disease present in this case; Dislocation, shortening, sinuses (four) over and about the great trochanter and all leading down to dead bone. The child was weak

and emaciated.

Treatment. On September 11th 1885, the head, neck, trochanters and a portion of the acetabulum were excised.

No ligatures were required. A long uninterrupted splint applied immediately after the operation, and extension three or four days after.

After the first week the child made rapid progress. In eleven weeks the incision was soundly healed, but two of the sinuses remained open, although discharging very little. Free movement in the joint unattended by any pain.

April 1st Quite well, being fat and robust. The two sinuses are still open but discharging slightly. Gets about on crutches quite well, and can bear considerable weight on the limb without pain.

Case VI. Caries of femur: Neck and trochanter involved; head and femoral articular cartilage destroyed; Dislocation on to the dorsum ilii; great malposition of limb with slight fibrous ankylosis; abscess formation, with continued suppuration; Excision of head, neck and trochanter; recovery in three months with useful limb.

J. F— aet: 11 years.

History. Seven years before admission, he was hit on the left hip with a stone; which was followed by considerable ecchymosis and swelling about the joint. Leeches and blisters were applied, & he was confined to his bed for some weeks. In spite of the treatment, however, he was noticed to limp on the left side, when he was allowed to go about again. He also complained of an intermittent pain in the left hip and knee. Eighteen months after he was treated at St Mary's Hospital, Manchester for seven weeks with extension and a long splint, but derived no benefit therefrom. Two years afterwards, abscess formation occurred on the inside of

the thigh, eventually bursting. Later, further abscess formation occurred on the outside of the limb, and it was now noticed that his thigh was becoming * acutely flexed on to the abdomen. For three years before admission he had been confined to bed. Admitted on the 3rd November 1885.

State on admission. The limb was then about three inches shorter than the sound one, and acutely flexed at the hip on to the abdomen, the leg being flexed on the thigh. The limb was also much inverted. Dislocation on to the dorsum. The muscles of the thigh were much wasted; the hip itself was considerably swollen; and about the joint were four sinuses, which all lead down to dead bone, and were discharging profusely. The boy looked haggard and had no pleasure in life on account of the malposition of the limb necessitating his lying on the prone position. On examining the joint under chloroform, there was ankylosis detected. Owing, however, to the

Continued suppuration and the presence of diseased bone detected by the probe, it was deemed advisable to make an exploratory incision for the purpose of further examining the joint. On November 20th, this was accordingly done, an incision over the dislocated head being made. On passing the finger into the wound considerable disease, involving the neck and great trochanter, was detected; so excision was determined on.

Treatment. The above exploratory incision was enlarged and the head, neck and trochanters of the femur were excised. No ligatures were required. No splint applied, the limb being steadied by means of sand bags. The boy began to improve in health almost immediately, and went on well.

At the end of eight weeks the wound was quite healed, and in a fortnight after the sinuses had closed.

Discharged Feb: 19th 1886. Could walk quite well on crutches. Was quite healthy and had got quite fat.

Case vii. Caries of femur: acute articular ulceration of femoral cartilage, and superficial caries of the head of femur; pus in capsule of joint; Excision of head and part of neck of femur; no acetabular disease; Still under treatment; doing well.

W. M —— aet: 16 years.

History. Seven weeks before admission, as he was walking home from his work, a severe pain shot into his left knee. Previous to this he had been quite well, following his usual avocation. He does not remember ever having hurt or twisted his hip in any way, and there was no limping noticed previous to the accession of pain. He was confined to bed, as the slightest movement of the limb caused acute pain. Admitted on the 26th December 1886.

State on admission. The left thigh, as he lay in bed, was flexed on the abdomen, the leg on the thigh. The left hip was slightly swollen and extremely tender; there was no shortening. He complained of intense pain in the left hip, shooting down to the knee, aggravated by the slightest

movement of the limb. Even jarring or shaking of the bed caused an excruciating pain.
Chloroform was administered for the purpose of further examining the joint. On flexing the thigh at the hip, a peculiar "crepitation" was felt, not unlike the crepitation got in fracture of the neck of the femur.
No suppuration could be detected, although there was swelling about the joint.
Acute articular ulceration was diagnosed, with in all probability the presence of pus in the capsule of the joint.
Treatment and Progress. Tonics and counterirritants etc were tried, but in spite of everything the boy got worse and worse, his general health manifestly failing. On January 15th 1886 an exploratory incision was made over the outside of the hip, and the above condition found. On opening the capsule about three ounces of thick pus were evacuated. Under the circumstances it was deemed advisable to proceed to the operation of excision. The primary incision

was enlarged, and the head of the femur and part of the neck were removed. The femoral articular cartilage was found to be almost completely ulcerated away, two or three small portions at the margin being still intact, but partially detached from the head of the bone. There was also superficial caries of the head of the femur.

After the operation there was considerable oozing, which was readily stopped by means of pressure, no ligatures being required. The severe pain in the hip and knee disappeared almost immediately after the operation, and has not returned since.

April 10th Doing well. Wound nearly healed. No pain and general health much improved.

Still under observation.

Case viii. Caries of femur: head almost completely obliterated; neck and trochanter undied; Similar Disease in acetabulum; Dislocation on to Dossum; abscess formation; Excision of head neck, Trochanters and portions of acetabulum; recovery in four [redacted] months with useful limb.

M. H —— aet: 14 years

History. She began to limp and complain of pain in the knee and hip ten years ago. The mother cannot assign any reason for its commencement. Eventually abscesses formed about the joint & burst, leaving sinuses which remained open until her admission on December 2nd 1886.

State on admission. All the characteristic Symptoms of advanced chronic hip joint Disease; right thigh flexed on abdomen; much inverted; Dislocation on to Dossum ilii; sinuses (3) about the hip Discharging copiously, shortening to the extent of 2½ inches. She also had a cough and complained of night sweats. Countenance pinched and anxious, Expression and manner deliberate, just like a little old woman.

Treatment and Progress. She was placed under a course of tonic treatment, iron and cod liver oil, with a nourishing diet, the treatment being continued for nearly six weeks.

On January 8th 1886. Excision of the head neck and trochanters of the femur, small portions of the acetabulum being gouged away.

After-treatment, exactly the same as in the above cases. There was almost immediate relief from the pain, and the child made rapid progress.

On March 20th the note was "Wound completely healed; sinuses closed; the girl quite fat and robust; cough and night sweats disappeared; allowed up."

On April 2nd Discharged, her condition then being most satisfactory. Could walk quite well with the aid of crutches, bearing a considerable amount of the weight of the body on the affected limb. Two and a half inches of shortening. Her countenance had quite lost the pinched and anxious expression. Result most satisfactory.

B. Analysis of the above eight cases, as to :-

i Causes.

In seven of the cases, a distinct history of injury was elucidated. (Cases i. ii. iii. iv. v. vi. vii)

In one case, the commencement was insidious, apparently without any cause. (Case viii)

ii Previous Duration of the Disease.

In four of the cases the previous duration was over five years (Cases i. v. vi. and viii)

In two cases, over one year (Cases ii. iv)

In two cases, nine months and two months respectively (cases iii. vii)

iii. Age and sex.

The ages were respectively 13, 4, 10, 10, 8, 11, 16 & 14 years.

The sexes were females 3. males 5.

iv. Conditions of Disease.

In all the cases there was caries of the femur with destruction of the femoral articular cartilage.

In one case. the head of the bone was involved (Case viii)

" one " the head and neck .. .. (Case ii)

" six " the head, neck & trochanter major were involved (Cases i. iii. iv. v. vi. viii.)

In four cases, the acetabulum was carious and required gouging. (Cases iii. iv. v. viii.). In one of these cases (case iii), there was perforation of

the acetabulum, with the formation of iliō-pelvic abscess

In four cases, Dislocation on to the dorsum ilii had occurred (Cases iv. v. vi. viii)

V. The operation.

In all the cases the method of operating was almost identically the same, so that one Description will suffice.

The incision employed was a simple straight longitudinal incision, from 2½ - 5 inches long, standing on the outer side of the thigh over and above the great trochanter. The muscles attached to the great trochanter were divided by sinking the knife in the longitudinal incision, the finger being then passed along the neck of the bone to the joint or to the Dislocated head lying on the dorsum ilii. In any further detachment of the soft parts the knife was simply directed towards and on to the bone. The capsule of the joint was in the first instance merely incised in a longitudinal Direction, and afterwards at both sides at the margins of the acetabulum. Adduction, rotation inwards, together with a push upwards

readily made the head of the bone start from the acetabulum or from the dorsum ilii, if dislocated. In case vii there was some difficulty experienced in doing this, considerable force being required to make the head of the bone start out from the acetabulum through the wound. The whole of the diseased portion of the bone was then removed either at once or at successive sections with a Butcher's saw, until healthy bone was reached, the soft parts being protected by means of metal retractors.
Lastly, the acetabulum was examined, and if necessary any carious or necrosed bone removed by gouge or bone forceps.
No ligatures were required in any of the cases as the haemorrhage was inconsiderable. In case vii, there was a considerable amount of oozing after the operation, which was readily stopped by means of pressure.
No sutures were employed, the wound being left open to heal by granulation, thus allowing a more ready escape of discharge. The wound in each case was lightly packed with Carbolic oiled lint, and afterwards well

dusted with powdered Iodoform.
In case iii., the operation was performed with all antiseptic precautions, and antiseptic (carbolic gauze) dressing being applied. A long uninterrupted splint was as a rule applied immediately after the operation, a small (3 lbs) extension weight being put on three or four days after the operation.

vi. The result.

In four cases, there was recovery with a useful limb. (Cases i. v. vi. viii)
Still under treatment, three cases (Cases iii. iv. vii)
*Death in one case. (Case ii)

In case i, the result was permanent ten months after operation.
In case vi, the result was permanent six months after operation.

* Died seven months after operation, from tubercular meningitis. He was quite convalescent from the operation

* Science and Art of Surgery. Erichsen.
vol: ii p. 441.

† Article on Morbus Coxarius. by Lewis A Sayre MD
New York 1863.

Section II

Short Summary of Hip Joint Disease.

In discussing the operation of excision of the hip joint, it is necessary to say a few words in connection with the causes, symptoms and treatment of the Disease generally. I shall, therefore, give a short summary of hip joint Disease.

A. Causes.

The great predisposing cause of morbus coxarius is undoubtedly struma. *Erichsen in his work on Surgery, says "Hip joint Disease most common-" "ly occurs in strumous subjects, indeed, I think," "its connection with scrofula is generally more" "distinctly marked than that of most other affections" "of the joints."

It is, however, a difficult matter sometimes to distinguish between a strumous diathesis and the condition, which is often produced by advanced hip disease, especially in those cases where there has been much of chronic suppuration and protracted suffering. †Sayre in his article on Morbus Coxarius recognised this, for he says "I believe that many have" "attributed the source of the Disease to a strumous" "origin, simply from the appearance of the"

" patient, whose emaciated, spanaemic condition "
" is regarded as the cause, when it is in "
" reality the effect of the Disease."

Sayre, however, goes on to say that the Disease is never produced by a constitutional predisposition only, but always requires some extraneous cause, such as violence or exposure. This I can't agree with, as I have in many cases been unable to elucidate any history of injury or exposure to cold, but where there has been a marked strumous diathesis and the disease seems to have been the result of the constitutional predisposition.

The exciting causes are numerous and varied; the commencement of the Disease often being attributed to some over exertion, a sprain of the joint in leaping or running, or to a bruise of the hip from falling.
Exposure to cold and wet are often put down as the exciting causes of the Disease.

B. Symptoms and Progress.

The symptoms vary according to the acuteness of the inflammation in the joint; those of acute arthritis being sudden in their onset and rapid in their course; those of chronic strumous arthritis coming on insidiously and running a protracted course.

i. Symptoms and Progress of Acute Arthritis

very often without any assignable cause, there arises a sharp shooting pain in the hip joint, extending from the thigh to the inside of the knee joint, and increased by any pressure on or movement of the hip. Occassionally the pain is felt at first only on the inside of the knee. The pain is of an excruciating character, aggravated by the slightest thing that causes any movement; for example the shaking of the bed room, a fit of coughing, or sometimes the weight of the bed clothes. The limb is flexed on to the abdomen, everted, and any attempt at outstretching the limb is excessively painful. Sometimes there is a distinct swelling about the joint, with an increased local heat. These symptoms are accompanied by a great

amount of constitutional disturbance, the temperature being very high especially in the evening. Standing or walking are attended with acute pain, or are altogether impossible.

If the inflammation does not subside, it passes on to acute suppuration, with augmentation of all local and constitutional symptoms. Pus collects in the joint, the fever takes on a hectic character and the abscesses become superficial. The case may now end from exhaustion or long continued hectic and suppuration; or the disease may pass on to a subacute or chronic condition.

ii. Symptoms and Progress of Chronic Arthritis.

There are three well recognised stages in hip joint Disease.

First stage. The disease almost always commences insidiously; the first symptom may often being a feeling of slight weariness or of some pain, with a certain amount of stiffness at the hip joint, which is always increased by exertion. As a consequence of the stiffness or pain the child is noticed to limp and walk in an

unusual manner. The greater part of the weight of the body, when standing, is borne by the sound limb, the affected limb being slightly bent at the knee and slightly everted. The pain, which does not as a rule come on until late in the first stage, is specially felt when pressure is made over either the front of the joint or over the hip in the region of the great trochanter behind, and is increased by walking, standing or "jarring" of the leg. It is often referred at this stage to the inside or sometimes to the front of the knee joint. Startings at night are very often noticed at this stage. There is more or less of immobility of the limb, limiting the movements of the joint to a great extent.

Second Stage. is characterized by the appearance of the following symptoms:— Flattening of the nates, with a lateral twisting of the spine; more or less continuous pain in the knee and hip joint, all movements in which the hip participates being the source of increased pain; The thigh is wasted and flabby; the

whole weight of the body rests on the outstretched sound limb; there is a greater degree of flexion of the knee, and eversion is more pronounced; abduction and apparent lengthening of the affected leg; arching of the back when the patient is placed on his back and the flexed knee straightened; the limping becomes more pronounced; sometimes contraction of certain muscles; & occasionally spasm of these muscles, especially at night.

The second stage gradually merges into the Third Stage, which is characterized by the appearance of shortening of the affected limb, either as a result of want of growth from Disease, or spontaneous luxation which sometimes happens, or of obliteration of the head of the bone.

Abscesses form around the hip, bursting in time, leaving sinuses which lead down to the Diseased head of the bone. The abscesses may burst into the pelvic cavity, pointing at Poupart's ligament. Adduction of the limb occurs as the case

becomes more advanced, the knee of the affected limb being brought across the sound thigh.
There is spasm of certain muscles, and later the contracted muscles gradually get shorter and shorter, becoming permanently and organically contracted.
The disease may even at this stage recover but with in the majority of cases a useless limb; or the suppuration may continue, hectic becoming developed and finally death from exhaustion or some intercurrent visceral disease.

C. Treatment of Hip Joint Disease.

Treatment of the first stage. It is of the utmost importance that the disease be recognised as soon as possible, in order that the child may be subjected to treatment at once.
The great indication in the first stage is to keep the hip joint absolutely at rest, and for this purpose numerous appliances have been invented and used, for instances Hewes couch, Hewes bed, Bonnets "grand appareil" etc. I think however, that the methods

which are now in common use are the most efficacious and the least irksome to the patient; namely the long splint with or without extension, Hamilton's double long splint or box splint especially for children, and Thomas' splint. The adoption of either of these appliances must depend of course on the acuteness of the inflammation in the joint, on the symptoms and on the position of the limb.
As a rule the application of the long splint together with extension for a period of from two to three months, followed by the wearing of a Thomas' splint, will be found efficacious.
The rest must be continuous and for an adequate period.
Inunction of Mercury, advocated by Scott; the use of the actual cautery; blistering over the joint; setons and issues: have all been tried and recommended in the earlier stages of hip disease. The inunction of Mercury is useful especially in those cases where the disease commences in the synovial membrane of the joint (white swelling)

provided the joint be kept at rest by suitable contrivances.

The general health must be attended to.

Treatment of the Second Stage.

The indications in this stage are to obviate any malposition of the limb that may be present, to fix the limb in the straight position, and to alleviate the pain and clonic muscular spasm which are characteristic of this stage.

The malposition can as a rule be easily managed by means of manipulation or by a slight extension apparatus applied to the limb. If there is much difficulty experienced in doing this chloroform should be administered and the limb straightened.

The methods enumerated above are to be employed to satisfy the second indication. The pain and clonic spasms will be alleviated by the application of an extension (weight and pulley). Myotomy has been proposed and tried for this purpose, but as a rule the treatment above indicated is quite sufficient

Treatment of the Third Stage.

All the methods advocated for the first and Second stages should be tried. When Suppuration occurs about the joint it is better to abstain from opening the abscess, as absorption has occassionally taken place.

If the pain is great & the pus too deep-seated to be conveniently reached the actual cautery has been employed and found to give relief.

If the pain continues still to be great the trocar or knife may be used, adopting in the latter case Hilton's method of opening an abscess.

There are some cases, however, which in spite of all treatment continue to get worse and worse, the discharge from the sinuses becoming more profuse, the general health manifestly failing with the development of hectic symptoms: it is in these cases that the only hope for the recovery of the patient, with a useful limb, lies in operative interference.

* Erichsen's Science and Art of Surgery.
Vol ii p 462.

Section. III

Operative Interference.

In the treatment of hip Disease there are three methods of operative interference, namely Incision, Amputation, and Excision. The two former methods I intend only just to touch upon, the latter method I shall discuss more fully.

A. Incision.

When, in certain acute cases of articular hip disease, pus has formed in the capsule of the joint, it is advisable to incise the joint on its posterior aspect and evacuate the pus. Its presence only sets up further irritation and eventually leads to disorganisation of the joint.

Professor Annandale advocates and has put to the practical test of experience this method of incision, and has obtained excellent results.*

Mr Gay in a paper read before the Medical Society of London, and published in the Lancet of 1856, strongly recommends free incisions into diseased joints; maintaining that the incision is made not merely to

*. Lancet: Oct: 26th 1850 pp 463. 464.

evacuate any matter that may be present, but the purpose of allowing the more ready escape of cartilaginous or other debris. In the same paper he publishes an account of three cases of advanced hip Disease treated in this manner. The first case was one of hip Disease of three years previous Duration, with sinuses about the joint, but very little Discharge. The sinuses were enlarged by incisions, & the joint opened, recovery taking place in fourteen weeks. The other two cases were not so satisfactory in their results as the first, as in both the cases fresh abscesses formed and burst on front of the thigh.*

The <u>incisions</u> should always be made with strict antiseptic precautions, where possible; and should be exploratory as far as the condition of the joint goes.
The incisions are not prejudicial to the after performance of section.

B. Amputation.

Under certain circumstances amputation of the limb for advanced hip disease is justifiable. But owing to the serious nature of the operation, the amount of shock attending it, and the high rate of mortality, it is rarely resorted to.

It should never be performed until excision has been tried and failed.

If after excision of the joint, the discharge from the sinuses continues to be still copious, and evidences of albuminoid degeneration of the viscera supervene, amputation is justifiable.

If after excision, osteomyelitis and acute necrosis of the shaft of the femur occurs, as it occassionally does, amputation is justifiable.

If after excision, the result is not satisfactory as regards the usefulness of the limb, and the limb is an incumbrance amputation may be proper.

* Translation of Paulus Aegineta by Francis Adams, published by the Sydenham Society. p: 396.

† Hancocks paper published in the Medical Times and Gazette for 1872. vol i.

C. Excision.

α. History of the operation.

Paul of Aegina* seems to have been the first surgeon to recognise the propriety of excising diseased portions of bone. "If" he says, "the fistula terminate with a bone" "and if it is carious or otherwise corrupted, the" "whole diseased portion is to be cut out" "with counter perforators"; and later on in his article on "Fistulæ and Fari" he goes on to remark; "In like manner the ex-" "-tremity of a bone near a joint, if" "diseased, is to be sawn off, and often if" "the whole of a bone, such as the ulna," "radius or the like be diseased it is to be taken" "out; but if the head of the thigh bone or" "pelvis be diseased, we must not attempt" "to operate, for fear of the adjoining arteries"

Since Paul of Aegina recognised the possibility of excising the hip joint for disease, there appear to have been no recorded case until Schmalz†, a German, in the year 1816, removed the head of the thigh bone. The case in which he operated on was one of advanced hip disease of some

* Cases of Surgery: etc by Charles White,
Manchester 1770. p: 66.

years duration; Dislocation on to the dorsum ilii had occurred, with sinuses about the joint leading down to diseased bone. The child's health was rapidly failing, so Schwalz determined on removing the head of the femur by operation. He accordingly made an incision over the dislocated head and found the upper part of the femur lying loose on the Dorsum. He required neither bone forceps nor saw, but by means of a strong pair of pincers extracted it, there being very little haemorrhage. The girl recovered.

This, then, is the first recorded case of Excision. Previous to Schwalz's operation, however, it had been proposed by Charles White of Manchester in 1769, for he observes in his "Cases of Surgery"; "I have likewise in a dead subject made an incision over the external side of the hip joint and continued it down below the great trochanter, when cutting through the bursal ligament and bringing the knee inwards, the upper end of the os femoris has been thrust out of its socket,

* Hancocks paper. Medical Times and Gazette 1872. vol i

"and easily sawn off; and I have no doubt"
"but that this operation might be performed"
"on the living subject with every prospect"
"of success." There is no evidence,
however, that he afterwards performed the
operation.

* Mr Anthony White, of the Westminster Hospital,
was the first British Surgeon to perform
this operation. In 1821, after consultation
with Mr. Travers, he excised the head and
neck of the femur for advanced hip disease
of three years duration. The patient (a boy)
was much emaciated and pulled down by
the excessive discharge from three sinuses
about the hip. A straight longitudinal
incision was employed, and the bone
sawn off below the trochanters, no
difficulty being experienced, and very little
blood lost. The round ligament and
cartilage were destroyed, and superficial
caries of the head of the bone was present,
but the bone had not lost much of its
original shape. At the end of a
year he had recovered, with a comparatively
useful joint and limb. He died five

Chelius Surgery . vol ii p 978.

* Oppenheims Zeitschrift vol i

† Gazette Medicale de Paris . vol i : 1833 . p: 135.

years after of pulmonary phthisis, the parts taken away after death being preserved in the museum of the Royal College of Surgeons. A false joint had formed, the resected end of the femur being securely but firmly fixed to the ilium by a strong capsule of ligamentous tissue. Mr. White's case was subjected to a great amount of opposition and criticism, but notwithstanding the complete success of the case, it does not appear that at any future time did he repeat the operation.

Hawson of Dublin excised the head and neck of the femur for advanced hip disease, the bone being divided above the small trochanter. The patient died three months afterwards from profuse suppuration, the acetabulum having become perforated with the formation of pelvic abscess.

* Carmichael operated on a young woman for medullary sarcoma of the thigh, but she died next day.

* Oppenheim and Suetin † both excised the head of the femur for gunshot injury, but their efforts were unsuccessful.

† Leopold F. Ueber die Resection des Hüftgelenkes
Augsburg. 1834.

* Medico - Chirurgical Transactions vol xxviii. p. 571.

† Textor operated three times, once for fracture of the neck of the femur, and twice for caries of the head and neck of the bone, but none of the cases were successful.
Heine, Gluge, Vogel, and Seidlot also operated about this time.
After whites and Hewson's cases the operation seems to have been entirely forgotten in England, and it was not until in 1845 that Sir Wm Fergusson resuscitated it. * Fergusson's first case was that of a boy suffering from advanced hip Disease with profuse suppuration, shortening of the limb, dislocation on to the Dorsum, in fact all the Characteristic signs of advanced hip Disease. The operation was performed on the 1st March 1845 and was eminently successful. A longitudinal incision about six inches long, was made in the line of the femur, and after having separated the soft tissues from the shaft of the bone, a chain saw, after some difficulty, was passed round the bone. This eventually broke, compelling Sir

William to adopt some other procedure.
The soft parts about the neck and trochanters were then divided, and by means of adduction, etc. the head of the bone was extruded through the wound sufficiently to enable him to divide the femur with an ordinary saw. About four inches of bone were removed, the articular cartilage being almost entirely removed from the head of the bone together with superficial caries of the denuded part.
The case did well, the boy soon recovering his strength and all hectic symptoms disappearing. Eventually he made a good recovery, the result being most satisfactory.
Sir William Fergusson's operation led to considerable amount of discussion and was subjected to a great amount of adverse criticism at the time. Sir Erasmus Wilson, Mr Syme and Mr Skey, together with many other eminent surgeons were strongly opposed to the operation, because of its bloody and formidable nature and because of the possibility of spontaneous

* Hancock. above cited.

cure occurring. Since then, however, the operation has grown in repute and has become a recognised operative procedure in certain cases of advanced hip disease.

It was not until 1857 that, what may be called, true excision of the hip joint was performed, as before that time Surgeons confined themselves almost exclusively to the femoral factor of the joint only, never, as a rule, interfering with the pelvis. Hancock* was the first British Surgeon to remove not only the head of the femur, but portions of the pelvic bones.

Since 1857 the operation has been many times performed, and is advocated by many eminent surgeons as a justifiable operative procedure.

B. Indications and Contraindications.

Whenever the hip is the seat of disease, incurable except by the surgical operation of removal, to save the limb by the partial operation of excision of the part, instead of sacrificing the whole limb by amputation, should ever be one of the principal objects of the Surgeon. Bearing this in mind, there are certain cases of advanced hip disease in which the operation of excision is justifiable and indicated. I propose, therefore to go over the several indications justifying this operation, and then to point out the contraindications.

Indications.

i. To save life. In some few cases of advanced hip disease, the patient's constitution becomes thoroughly undermined by the excessive Suppuration and discharge; fatal hectic Symptoms develope and unless something be done to remove the carious or necrosed portion of the bone, which is the source of the irritation, the case will end fatally. It is in these cases the operation is most imperatively indicated.

ii <u>In advanced stages of femoral coxalgia</u>, with functional inutility of the limb, as a result of destruction of the articular cartilage, without the supervention of anchylosis. The head of the bone in these cases will be found to be carious or even necrosed, lying on the dorsum ilii, with sinuses round about the hip leading down to diseased bone and discharging profusely. The pelvic bones are healthy, and the cavity of the acetabulum filled by a soft fibrous tissue. The limb is shortened and adducted, the thigh acutely flexed on the abdomen and the limb functionally useless.

If nothing be done in these cases, in all probability, they will end fatally, or if they do recover after years of suffering the limb will be shortened, adducted, in bad position and altogether useless.

<u>Dislocation of the head of the bone on</u> to the dorsum ilii is no bar to the operation, but facilitates it. At one time the operation was not considered justifiable unless dislocation had occurred, for instance

* Mr. Henry Smith on Excision of head of
the femur for Caries. of the hip joint
Lancet. March 25th. 1848.

*Mr Henry Smith in 1848 laid down the following rules "The disease must be "
" in its last stage; it is necessary that "
" Dislocation of the thigh bone from its socket "
" should have taken place; and there must "
" be evidence of the disease being confined "
" chiefly to the upper part of the bone, "
" and of a non-implication to any great "
" extent of the pelvic bones." Now, however, the presence of Dislocation is not considered a necessary symptom, although it greatly facilitates the performance of the operation.

In early stages of femoral coxalgia, where rapid ulceration and destruction of the femoral articular cartilage occurs, followed by superficial caries of the head of the bone, with suppuration within the capsule of the joint and considerable constitutional disturbance, the operation is justifiable, if after an exploratory incision the above condition be found. Formerly, excision was only performed in the advanced stages of the disease and it is to Annandale we are indebted for having

pointed this out as an indication for excision. The successful result of Case vii. also, bears this out, the performance of the operation being followed by almost immediate relief from the excruciating pain and great improvement of his constitutional condition.
Early excision is also required in those cases of acute epiphysitis leading to necrosis of the head of the bone.

iii. In acetabular coxalgia, where the lips and cavity of the acetabulum are diseased, and where perforation of that cavity occurs with the formation of intrapelvic abscess, the operation is indicated. Previous to 1857, any disease of the acetabulum or pelvic bones was an insuperable barrier to operation, but Hancock in that year maintained that the presence of acetabular disease was no contraindication but rather an indication for excision. Since 1857 large portions of the pelvic bones have been removed for disease with very good results.

* Holmes' System of Surgery. Vol v. p 693.

In certain cases of femoral coxalgia the disease spreads to the acetabulum producing ultimately secondary perforation of that cavity with the formation of intrapelvic abscess: it is in these cases also that the operation is indicated, even if it were only as a means of affording sufficient drainage for the pelvic abscess.

Contraindications.

i. Ankylosis of the joint. If ankylosis of the joint has supervened the operation is not justifiable for the purpose of rectifying any malposition. As a rule, Division of the neck of the femur, as recommended by Adams, will be found quite sufficient.

ii. Adult age. is a serious contra-indication to the operation. A few cases of recoveries after the age of 20 have been recorded.*

iii. Visceral diseases, in so far as they are incompatible with life or the powers of repair, contraindicate the operation. Several cases have, however, been recorded of recovery with chronic Kidney and liver

disease. In case viii, where there were all the signs of incipient phthisis, the cough and night sweats disappeared after the operation.

y. Methods of operating.

The different methods of operating all depend on the primary incision which is employed, as the proceedings after that are essentially the same in all cases.

i. Simple longitudinal incision. This was the method adopted in all the above cases, and it was found to afford ample room for the further performance of the operation. If sinuses be present on the outside of the hip, a Director may be passed down to the head of the bone and the knife directed along its groove, freely incising the tissues over the head of the bone. The extent of the incision will vary according to the position of the caput femoris and the extent of pelvic mischief. As a rule an incision from 2½ – 5 inches in length is quite sufficient, two thirds of the incision being made into the gluteal

#. Erichsens Surgery. vol ii . p. 466.

* Philadelphia Journal vol i p117. 1825.

†. Hamburger Zeitschrift . vol i part ii

*. Erichsens Surgery. vol ii p. 466.

muscles above the trochanter and one third over the great trochanter.
Oppenheim, Sueter, Fernandois, and Langenbeck adopted this method.

ii. By a T-shaped incision. This is a method which is also very often employed, the object being to get as much room as possible. The lower end of the cross cut of the T, affords a much more dependant drainage, than when the longitudinal incision is used.

iii. # Semilunar incision, advocated by Sayre, the concavity looking forwards. Sayre maintains that it is specially applicable in those cases where there are no sinuses to interfere with the incision.

iv. By the formation of a flap: either in the shape of a U.; as recommended by Perry and Roux;* or by the formation of a triangular flap, as recommended by Jäger†

v. Parker's method of reaching the joint by an anterior incision, which is made in the interval between the tensor vaginae femoris and the Sartorius. *Erichsen

recommends it to be employed in those cases only in which the head of the bone is alone diseased, and when it is not necessary to remove the trochanters. It is also especially applicable in those cases where the abscess is pointing in that situation, and should never be attempted when there is perforation of the acetabulum and the consequent formation of intrapelvic abscess, as it does not provide efficient drainage. It should also never be employed when there is dislocation of the head of the bone backwards on to the dorsum ilii.

The Extent of Bone to be removed.

There is a great diversity of opinion, even at the present day, as to how much of the femur ought to be removed, that is to say whether the division should be made above or below the great trochanter.

The German Surgeons as a rule saw through the neck of the femur, and remove the great trochanter afterwards, if found necessary.

The British and American Surgeons on the other

* Archiv. für Klinische Chirurgie. 1870.

† "De la résection coxofémorale pour Carie"
These de Paris. 1869.

hand adopt the method of Dividing the femur below the trochanters.
There is no doubt I think, that the removal of the great trochanter is never followed by a worse result functionally than mere decapitation of the bone; and that by removing the great trochanter a much more efficient drainage is procured.
Statistics would also seem to indicate the advisability of removing the trochanters, for Leisrink in his report on this subject showed that 51.7% of the cases recovered when the great trochanter was removed, while only 33.3% recovered when the femur was divided through its neck.*
Richard Good also arrived at the same Conclusion, as out of his 49 cases of excision of the hip 30 cases or 61.23% died when the division occured through the neck of the femur. Out of 56 excisions below the great trochanter, 27 only died or 48.21 per cent†.

Large portions of the acetabulum sometimes require gouging, and even the adjacent parts of the ilium, pubes, or ischium may require removing.

* Erichsen. Vol: ii. p. 468.

† Archiv. für Klinische Chirurgie (1870)

‡. British Medical Journal. July 26 1873.

8. Results.

There are two great points to be considered with regard to the results of excision of the hip joint for disease, namely:—

i The Mortality immediately Due to the operation.

ii The Ultimate usefulness of the limb.

i The mortality immediately due to the operation.

* The Clinical Societies collected the statistics of 203 Cases, of which 29 or 13·7 per cent Died, the Deaths being immediately Due to the Operation.

† Weismuth of Hamburg collected the statistics of 176 cases of excision of the hip, and out of these 98 deaths occurred, but only half the deaths could be attributed to the operation. 24 or 13·6% Died from intercurrent disease such as pyaemia, septicaemia. 14 or 8% Died in a fortnight from exhaustion. 14 or 8% Died in a month from exhaustion (amyloid disease and phthisis). 27 Died from the beginning of the second month to the end of the year after the operation. 9 Died in the course of two or more years.

Annandale operated 16 times, only three Deaths occurring some months after the operation

* Langenbecks Archiv: vii p: 701.

† Lancet. July 15. 1871. Aug 5th. 1871.

#. Erichsen. vol ii p 466.

* Eulenberg collected the statistics of 56 cases, 28 occurring in Germany, 21 in England, 1 in America, 1 in France, & 5 in Russia. Out of the 56 cases, 24 died and 22 recovered, while 7 were in process of cure, 3 not cured.

† Gant in a paper on this subject gives Dr. Hodges and Mr Haucocks statistics, tabulates those of Goods of America (112 cases) and deduces the three following general conclusions regarding the rate of mortality

i In different countries a very different mortality, being highest in France and lowest in England.

ii An average death rate of 1 in 4 or 5.

iii. Very different death rates in the hands of individual surgeons.

‡ Croft in 1861 published the statistics of 45 cases in 18 of which death occurred. Of the 40 per cent of deaths 15.6% died directly from the operation. 13.4% from some form of tubercular disease. 6.6% from albuminoid disease. 4.4% causes unconnected with the joint affection.

From the above statistics it will be seen

* Of the 42 cases that could use the limb, 19 could walk without support, 9 with the help of a stick, 1. two sticks, 1. a splint, 1 a crutch, 2 two crutches.
In 40, out of the 52 cases that recovered, the limb supported the body.

therefore that the mortality directly due to the operation is not so great as one might have supposed, considering the serious nature of the operation. Taking all the above statistics together it will be found that the mortality directly referable to operation comes to less than 25 per cent of the cases operated on.

I am unfortunately unable to draw any definite conclusions as regards the rate of mortality in the above 8 cases, described in the first section of this thesis, as they have not been under observation a sufficient length of time, but the rate of mortality directly referable to the operation is practically nil at present.

ii. Ultimate usefulness of the limb.

Of Mr. Hodge's cases (111) 56 recovered with a "more or less" useful limb.

* Of Good's cases (112) 52 recovered, 42 of these being able to use the limb.

Of the four cases that recovered, under my own observation, the limb was useful. Both crutches being required for some months after the operation through.

In all the cases that recovered the joint was freely movable, fibrous ankylosis having occurred.

The results of excision as compared with those cases of advanced hip disease which have undergone a spontaneous cure are very favourable. The limb in the latter case is as a rule firmly ankylosed in some bad position, rendering it more or less useless as a means of progression. Whereas, after recovery from excision there is as a rule a movable joint at the hip, the limb is almost always straight, and the period of suffering is very much diminished. Cessation of growth of the limb after excision is not very much, and certainly not more than in those cases of spontaneous recovery. Crutches are as a rule required some little time after the patient begins to go about, but eventually the crutches are cast aside and either a stick or nothing at all used.

BIBLIOGRAPHY.

The following Books and Journals have been referred to :—

Erichsens Science and Art of Surgery.
Barwell on Diseases of Joints.
Chelius' System of Surgery.
Holmes' System of Surgery.
Fergussons Practical Surgery.
Spences' Surgery.
Syme on Excision of Joints.
Paulus Aegineta. Trans: by F. Adams.
Sydenham Soc. pub:

Lancets.
British Medical Journal.
Medical Times & Gazette.
Medico. Chirurgical Transactions.
Saint Bartholomews Hospital Reports.
Edinburgh Medical Journal.
Biennial Retrospect. of Medicine Surgery.
London Medical Gazette
Etc. Etc. Etc.