clot, and then the artery was normal down to the sac. The sac had burst, and the parts immediately around it were in a gangrenous state, so that it was difficult to understand its exact relations. A large mass of fibrine rested on what appeared to have been the orifice of communication between the sac and the artery. The popliteal vein and its tributaries were plugged with softened fibrinous clots, and around the vessels were small scattered abscesses.

ROYAL BERKSHIRE HOSPITAL.

CASE OF SUPRARENAL CAPSULAR DISEASE.

Under the care of C. COWAN, M.D., Physician to the Hospital.

[Communicated by A. FERNIE, Esq., Resident Surgeon.]

JULIA SAYER, aged 14, was admitted into the hospital, under Dr. Cowan, on March 31st, 1857. She was one of a family of five. Her father died of phthisis; her mother is now alive and well. Up to the last three years, her health had been that of ordinary children; but ever since, her mother stated, she had always been ailing, the prominent symptoms consisting in a ravenous appetite, emaciation, occasional headache, frequent vomiting, and a general progressive state of cachexia. She seemed to have been much neglected at home, her food consisting chiefly of bread; and she had been allowed to consume unlimited quantities of sweets, apples, cakes, and similar unwholesome eatables. During this three years of ill health, her spirits had been particularly cheerful, and she had been noticed as a remarkably gay and lively child. No peculiar discoloration of the skin, amounting to a bronzing, appears to have been remarked by her friends; the only observation being that she had gradually assumed a less healthy appearance, and the nails of the fingers were in the habit of occasionally dying away, as was said. Within the last few months, the vomiting had assumed a much more serious aspect, it being constant, and often occurring directly after a meal had been taken.

A few weeks before admission, she had been under treatment at the Reading Dispensary. On March 31st, she entered the hospital, and remained much in the same condition until April 18th; her case being considered at first, I believe, as one of incipient phthisis. She had never menstruated. Upon admission, although there was no such amount of discoloration of skin as to particularly strike the eye, her complexion was of a generally muddy character, far different from that of ordinary children, and unlike that of common anæmia. The nurse of the ward particularly noticed the black colour of the nails, and thinking it caused by dirt, attempted to remove it by washing, but then discovered it to depend on some pigmentary alteration. During the eighteen days she was under treatment, the most marked symptom was vomiting; not one day passed without its occurrence, and frequently it took place several times during the day, generally coming on after a meal, the girl often bringing up the whole of her breakfast and dinner almost directly after it had been swallowed. The bowels acted daily. She moved about the ward in the ordinary way, and seemed tolerably cheerful. There was no decided lung disease detected, excepting a suspicion of some abnormal state of each apex. The urine was tested, and found of a normal character. She complained constantly of pain in the right side. Her pulse continued soft and compressible. During this time, however, there was a general loss of power, with emaciation, not at all to be accounted for, since no special organ could be pointed to as diseased; and she did not improve under any treatment. Upon inquiry, it was found that the nurse of the ward, while attending to her at different times, had noticed an irregular brown patch on the skin of the chest, besides a number of smaller spots of a darker colour, of the size of a sixpence, over both legs; and she described the general colour of the body as much darker in some places than others. This condition of skin was sufficiently marked as to make the nurse of the ward speak of it to some of the other nurses as an unusual thing, although she did not mention it to any of the medical authorities. Eighteen days after admission, the girl began to vomit more severely than before; and this was attended with a sudden and alarming state of prostration, her pulse being small, skin cold, circulation feeble, and the vital powers exceedingly reduced; at the same time, she complained severely of the pain in the right side. She remained for forty-eight hours in this condition, nothing in the shape of stimulating or other treatment appearing to have any effect. The symptoms in-

creased, vomiting being incessant, and she died after forty-eight hours in an utter state of prostration. Dr. Cowan speaks of her condition at this time as resembling that in which some violent poison, as arsenic, had been administered, and death had occurred from the sudden shock to the system.

The body was examined about thirty-six hours after death. The only disease found in the chest was a small deposit of tubercle at the apex of each lung surrounded by some congested lung-tissue, this deposit being in some parts firm, at others diffident, and in one lung it had degenerated into a calcareous state: the great mass of each lung was healthy and competent. In the abdomen, the liver, spleen, kidneys, stomach, and intestines, were found healthy. In the pelvis, all was healthy, excepting a small cyst connected with one ovary, which was removed more as a matter of interest than as connected with the present case. The brain was examined, but a most careful dissection failed to detect the slightest trace of disease. The suprarenal capsules were both much enlarged. A vertical section of each organ exhibited almost, if not quite, universal disorganisation: the tissue consisting of a yellow cheesy deposit, mottled with occasional narrow streaks of a red substance; this yellow deposit was for the most part firm, about the consistence of Gruyère cheese, and somewhat resembling it in appearance; at different parts in each organ, this tissue assumed the consistence of thick cream, evidently the result of a softening of the solid portion; and at one part the degeneration had assumed a distinctly calcareous character. On the exterior of the left capsule, a shallow cavity existed, as large as a sixpence, full of soft semifluid yellow substance, which had been adherent to the pancreas, but torn away during the removal of the organ. Under the microscope, the tissue was seen to consist of small irregular cells, of different sizes, some with two or more nuclei; a good deal of free granular matter and oil globules; the more fluid part exhibited a large quantity of fat—the character altogether being that of scrofulous matter.

REMARKS. Upon consideration of this case, there can, I think, be little doubt of the fact that death resulted from suprarenal disease. The amount of disease which existed in the lungs was trifling, and certainly not likely to so rapidly produce a fatal result. The symptoms also bear so singular a resemblance to many of those cases published in the *Medical Times and Gazette*, as not only to justify but even demand a classification in the same category. The alteration of colour in the skin was not so decided as to draw particular attention to it as a means of assisting the diagnosis; but we probably have yet to learn in what cases this discoloration is present, and how modified. It is, however, another proof of what is now, I suppose, an established fact, that life cannot be maintained after loss by removal or disease of the suprarenal capsules.

Original Communications.

NECROSIS OCCURRING IN THE NEIGHBOURHOOD OF JOINTS OR OTHER IMPORTANT PARTS: WITH THREE ILLUSTRATIVE CASES.

By KELBURNE KING, M.D.

[Read before the East York and North Lincoln Branch, May 26th, 1857.]

In former times, considerable looseness prevailed in regard to the use of the words necrosis and caries, and we find them often employed as almost convertible terms, and applied to nearly all diseased conditions of osseous structures. A more discriminating pathology has, however, limited and defined their use; and we now apply the name of necrosis only to cases in which absolute death of a bone or part of a bone has occurred, while caries is confined to a peculiarly intractable ulceration and softening of the osseous tissues, not malignant in character, but of so low a type as to afford no hope of the ultimate recovery of the affected parts, and but little of their being separated from and thrown off by the surrounding healthy tissues.

The two diseases are of a totally opposite nature, and run a perfectly different course. In the one, there is complete death and isolation, so to speak, of a portion of bone, which

becomes altogether independent of the animal economy, and acts upon, and is acted upon by it, solely in the manner of a foreign body. This receives the name of a sequestrum; and, while it continues in contact with the living parts, there is a process continually going on whose object is to separate it from them, and altogether expel it from the body. This is the process of exfoliation, and is analogous to the separation of sloughs and mortified parts from the soft tissues. In conjunction with this, there goes on usually, but not necessarily, another process, by which a new deposit takes the place of the dead bone.

The formation of new bone is one of the most interesting processes of the living body, and has attracted much attention from physiologists and pathologists, as well as from practical surgeons. I do not propose to enter on the subject here, but may merely remark, that the opinion of Scarpa, and many eminent men of the last age, that bone only recreates bone, has not stood the test of further experience; and it is now regarded as an established fact that the periosteum is the part mainly concerned in the deposition of new bone. This much is proved, that bone cannot repair breaches in its continuity when deprived of its periosteum; and that the latter is capable of recreating new bone when completely separated from the old.

In necrosis, then, we have, first, the death of a bone or defined portion of bone; secondly, the removal of the dead portion from the animal economy; and thirdly, we have in most cases a separate process by which the loss occasioned by necrosis is repaired.

The nature and progress of caries are altogether different. We have not death of a well defined portion of bone, but ulcerative disease, liable to continual extension. The portion of bone which is affected by caries loses the natural firmness and toughness of osseous matter; it becomes soft and friable. The probe pushed into it does not meet the resistance offered by healthy, far less that presented by necrosed bone. If a carious bone be examined after maceration, it presents a porous whitened appearance, much as if the disease consisted of a constantly spreading necrosis of the minute osseous walls which surround the cancelli. The disease has no well defined limit, but passes imperceptibly into the healthy bone. It has no tendency to heal; and, though it is not impossible that, if of small extent, it may be carried away by the suppurative process, the chances are much greater that it will go on involving the previously healthy parts, and finally, unless removed by operative procedure, wear out the strength of the patient. Time, which effects the cure of necrosis, adds only to the intensity of caries; and operative procedures, which in necrosis are required only as adjuvants to natural processes, are necessary in caries, to make up for the want of healthy vital actions, or to supersede disease.

These diseases differ not only in their natures, but as to the portions of bone liable to be affected by them. Necrosis, it is well known, principally attacks the shafts of the long bones; caries, the short bones, or the cancellated parts of the long; and from this there results a great difference in the general prognosis of the two diseases. Necrosis occurring in the shaft of a long bone must usually have a favourable termination. It may tax the patience of the sufferer; it is rare indeed that it will prove fatal to life or limb; and, accordingly, it is a very uncommon thing to hear of amputation for necrosis at all; and rare indeed, unless it have extended into a joint. But the opposite conditions occur in caries. The short bones, or the extremities of the long bones, become the seat of a disease whose tendency is to spread, which does not heal, and which, of a wasting nature in itself, becomes doubly so when, in its progress, it has caused ulceration or absorption of articular cartilages, and laid the foundation of the worst form of articular disease. We find that there is no such fertile source of amputation and resection of joints as caries.

From these facts, taken together, the hopefulness of necrosis when left to itself, or but slightly assisted by the surgeon; the hopelessness of caries, unless the surgeon takes the work out of Nature's hands, and does it for her; the frequent occurrence of caries, and the rarity of necrosis, in the neighbourhood of joints, and in the vicinity of cancellated bones,—it has come that the mere situation of fistulous openings may have at first sight some influence in determining the treatment and prognosis of a case. That more than due weight may not be allowed to these impressions, and to show that we find occasionally necrosis occurring in positions where we should rather expect caries, is the object which I have in view in this paper.

The symptoms are occasionally so masked in the earlier

stages, more particularly of such cases of necrosis as I now refer to, that they seem rather to belong to some other disease; and a safe and simple treatment may thus be neglected, to the injury of the patient and the chagrin of the surgeon, in consequence of a false opinion being formed at the outset, and on insufficient data. This is one of the nooks and corners of surgery, which can hardly be treated of in systematic works, but which are every now and then obtruded on our notice in practice; and, on that account, I have thought that a few cases bearing upon necrosis occurring in the neighbourhood of joints or other important parts, and to a certain extent simulating other diseases, might not be uninteresting to this meeting.

My own attention has been lately attracted to this subject, in consequence of having at present under my care two cases of necrosis of the lower end of the femur, so near the knee-joint, and presenting so much the appearance of disease of that articulation, as to have led to the idea that they were cases of white swelling. As an illustration of my meaning, I may narrate the details of one of these cases so far as it has gone.

CASE I. On March 12th, 1857, I was asked to see Mrs. B., the wife of a farmer residing near Scaddletorpe, in consequence of what I was told was a white swelling of the right knee-joint, regarding which I received the following history. Rather more than a year before, when stooping on the ground, she knelt accidentally on a boy's marble. She experienced considerable pain in the knee-pan, but took no particular notice of it for some time. The pain, however, after a little, increased greatly. Considerable swelling took place in the neighbourhood of the joint, the motions of which became weak and limited. The affected limb could not bear the weight of the body, and she had to sit with her leg constantly extended on her thigh. Leeches, cupping, blistering, and the introduction of an issue, were all employed; and at length, after long continued poulticing, an abscess opened on the inner and posterior aspect of the knee, and a quantity of purulent matter was discharged: still the pain on motion and weakness of the limb continued to increase. Finding no relief from scientific practice, she placed herself in the hands of a celebrated female practitioner of this locality, who promised her a speedy cure—with what result, I need not say.

On my seeing her, I found her lying on a couch, with the affected limb stretched out in nearly a straight line. The region of the knee-joint was much swollen, especially at the upper part; and at the anterior aspect, just above the patella, extensive fluctuation was perceptible. At the posterior and inner aspect of the joint, just beneath the condyles of the femur, were two fistulous openings, from which, on pressure, there flowed a sero-purulent discharge. So far, all her symptoms seemed to point to disease of the knee-joint. The history of the case, the general appearance of the limb, and the position of the fistulae, all indicated, first inflammation, then suppuration of the joint; but, even at first sight, there was a peculiarity in the appearance of the part; and, on examining more minutely, the swelling was found to be situated above the patella and the condyles of the femur, the margins of which could be felt distinct and sharp in their usual situation. On pressing the patella downwards, no pain was felt; nor on gently bending the leg upon the thigh, nor on striking the heel up towards the knee. It was evident, then, that the disease was not within the articulation. A probe was introduced through the sinuses, and, after passing a long way, came into contact with necrosed bone. This was too firm to admit of removal; so I laid open the abscess on the anterior aspect of the thigh, and advised her to return home for a period, until the sequestrum should separate from the living bone.

This case, although as yet without result, I have thought it worth while to bring shortly before your notice, as exemplifying the way in which necrosis near the knee-joint may simulate, both in its history and its symptoms, disease of the articulation itself. It may also inculcate caution in our prognosis of such cases, as I think it very possible that, some months earlier, the diagnostic marks were not sufficiently developed to enable a decided opinion to be formed as to the true seat of the disease.

The following cases have occurred sufficiently long ago to enable me to speak with confidence, not only as to their nature, but as to the result.

CASE II. In the winter of 1848, a young man, Wm. Murray, aged 21, resident in Kilmalcolm, a rural village in Renfrewshire, N.B., called upon me, and begged as a great favour that I would amputate his right leg above the knee. He was in the condition of a farm labourer; but, from the time he was a boy, had been able to work but little, in consequence of pain, weakness,

and stiffness of his right knee. He was consequently almost always dependent for support on the parish. So hard is the bread of charity, that this poor lad, with tears in his eyes, prayed me to give him the chance of doing something for himself, by the sacrifice of that limb which had always kept him down. Being at that time surgeon to the Greenock Infirmary, I sent him there for examination and treatment.

He was admitted on November 9th, 1848. His knee was then somewhat bent, and could not be fully extended—stiff and limited in its motions; and there was a good deal of swelling about it, as if from lymph effused among the tendons. There was no pain from pressure of the fingers; but he walked with a limp, and was soon fatigued. The case might have very well passed for one of chronic rheumatism, but that on the posterior and external aspect of the knee there was a sinus, which had existed for many years; that is, a sinus had generally been there or in the neighbourhood; for it would sometimes heal and remain closed for a time—only, however, to reappear in some adjacent part. A probe introduced into this opening passed far downwards and inwards, as if across the joint, and with considerable difficulty was made to strike upon necrosed bone, which felt loose.

On November 16th, he was placed under the influence of chloroform; and, as it was impossible to follow the direction of the sinus with the knife, without cutting across the outer hamstrings, and even dividing the great vessels and veins, an incision, four inches in length, was made along the outer aspect of the lower third of the thigh; and, room being thus obtained, the sinus was followed, and, on getting towards the internal condyle beneath the vessels, two pieces of necrosed bone, about half an inch in length and a quarter of an inch in breadth, were removed with the ordinary dressing forceps. A quantity of rough spicula of new bone was felt in the neighbourhood, but no more loose pieces were found; and the parts were brought together. After this he progressed favourably up to a certain point; the limb resumed more of its natural appearance; and he could walk better, and without feeling so much of the pricking sensation which had before rendered him so helpless. The wound healed kindly, but a sinus still remained, at the bottom of which loose bone was detected by the probe. I was convinced that some necrosed bone still remained, and, on January 17th, 1849, having put him under the influence of chloroform, made an incision still freer than the former one; and, finding some pieces of necrosed bone firmly held in the grasp of new bone, used the bone forceps and the trephine until I was satisfied that no cause of mischief was left. I well remember the formidable nature of the operation, from the length of time which it occupied, and the freedom of incision it demanded; but the object was gained. From that time he progressed rapidly; and, on February 14th, 1849, he was sufficiently well to leave the hospital, his knee being now almost restored to its natural appearance, and being quite capable of doing any ordinary work without fatigue or inconvenience. The wound had not quite healed, but in all other respects he was perfectly cured. I may mention that I saw this lad a year afterwards, and he was then quite well, the wound healed, and he had had no return of his symptoms. I have heard of him since, some years afterwards; and he still continued perfectly well.

This case shows that there may be pieces of necrosed bone situated deep among muscles, too large to be readily brought to the surface, and too small to excite such an amount of irritation as would have necessarily called attention to the true nature of the disease. Yet their existence may produce a train of symptoms which, while they embitter the life of the patient, are apt, at the same time, to call the attention of the surgeon from the comparatively simple nature of the case, and lead him to suspect deep-seated disease of the articulation.

I may mention that the popliteal space is not an uncommon position in which to find such examples of necrosis; but the case I have narrated presented more than usual difficulty, in consequence of the entanglement of portions of the sequestra in the deposit of new bone.

I have now to submit to your notice a case in which symptoms, not unlike those of hip disease, were produced by a small portion of necrosed bone, and at once removed on its extraction.

CASE III. On January 2nd, 1855, I was consulted by a young man, R. I. T., aged about twenty years, regarding what he called disease of the hip-joint, and of which he gave me the following history. Some three years before, when engaged in gymnastic exercise at school, he fell and strained his right hip. For six or seven months he did not experience much uneasiness (though the pain never entirely left it). He then

had a violent attack of fever, accompanied by great pain and swelling of the hip. Leeches and fomentations were applied; and at the end of a month an incision was made into the posterior aspect of the hip, and a large quantity of purulent matter was evacuated. The wound soon healed, but this was followed by another attack; and matter having again formed, was again evacuated, and a seton put in. This was kept in for some time, and he was sent to the sea side, where he remained for a twelvemonth, but without gaining much ground. The sinuses continued to discharge more or less; walking occasioned "dreadful pain at the hip", to use his own words; and though sometimes better than at others, his lameness did not on the whole improve. Shortly before I saw him another abscess formed at the upper and posterior aspect of the thigh, which also was opened with the lancet. His disease had persisted for nearly three years, and he had no expectation of being anything else than lame for life.

When I saw him he was a good deal emaciated, and had a sickly delicate look. On examination, the right hip presented a somewhat wasted and flattened appearance. He complained of pain on motion of the hip-joint, but it was not of an acute character; and pressing of the trochanter against the acetabulum produced no uneasiness. Two sinuses were open, one midway between the trochanter margin and tuberosity of the ischium; the other lower down at the upper part of the thigh. He had a distinct halt in his walk, and, indeed, had not walked without a stick for two years. From this examination I suspected that the disease was exterior to the joint, and made a careful examination of the sinuses with the probe. After some difficulty, and at a great depth, it came in contact with a portion of necrosed bone, which seemed moveable, and I was then convinced that his idea of hip disease was erroneous, and that it was a case of necrosis of a portion of the os innominatum in the neighbourhood of the articulation. Acting on this idea, on the 4th of January, 1855, I dilated the sinus with a probe-pointed bistoury, and extracted, with the ordinary dressing forceps, a small portion of necrosed bone. From this time he never had a bad symptom. The lameness and pain on walking disappeared. The wound was long in closing entirely, as might have been expected from its depth; but by the 21st of February not only were the sinuses healed, but he had gained flesh, and a feeling of health such as he had not known since the commencement of his malady.

I saw him a year afterwards, and learned that he had never had any return of the pain of the hip or lameness; that one of the sinuses had opened some time after I saw him, and discharged a little matter, but had soon healed up. His health, he said, and his appearance bore him out, had been perfectly good ever since the extraction of the necrosed bone.

I have now to mention briefly the history of a case in which urinary fistulae were dependent on necrosis of the os innominatum; and though I cannot refer to this as a case successful in result, I may be allowed to bring it before you as proving the remarkable train of symptoms which this disease may produce.

CASE IV. On April 12th, 1853, I was consulted by a man named Drewry, a shepherd, residing near Uleby, Lincolnshire, regarding urinary fistulae, which had existed for the last four years. He stated that, having been engaged in applying some lotion to diseased sheep, he became very ill; and, from his description, had evidently been profusely salivated. After that he had severe urinary complaints, and finally an immense abscess burst partly in the perineum, partly in the upper part of the left thigh, from which a great quantity of purulent matter was discharged by several apertures. After a little he observed that when he passed urine a portion of it came away by these openings; and this state of matters had since continued uninfluenced by treatment, and to his great discomfort.

On examination, I found great induration of the parts referred to, and a number of fistulous openings in the perineum and top of the thigh. As he happened to wish to evacuate the bladder, I had an opportunity of observing that during the act of micturition urine came dribbling through these sinuses. I made an exploration of the urethra, and found that the largest sized catheter passed readily into the bladder, though I thought that there seemed an unusual roughness about five inches from the orifice. I then examined the sinuses with the probe, which passed up to the eye in the femoral apertures without encountering anything. On passing it into one of the perineal fistulae, however, it came in contact about an inch and a half from the surface with a portion of necrosed bone, which seemed of considerable size, but moveable. He was a strong, athletic

looking man of fifty years of age, and exceedingly desirous of submitting to anything for the purpose of being relieved.

I came to the conclusion that, in consequence of the mercurial action, a portion of the os pubis had exfoliated; and, as the position seemed to correspond with the margin of the foramen thyroideum, that an abscess had extended from that part forwards through the adductor muscles and inwards to the perineum, opening the urethra in its course. I therefore advised him to return to Hull and remain there for a few days, that he might have the necrosed portion of bone removed. To this he consented.

Accordingly, on the 30th of April, 1853, with the assistance of Dr. Frazer of the 21st Regiment, then in garrison here, he was placed under the influence of chloroform, and the probe passed down to the sequestrum through one of the perineal fistulae. The sinus was freely dilated, a catheter having been first passed into the bladder and maintained there by an assistant as a kind of landmark. The necrosed bone could be readily felt; but it was too tightly held in its position to be removed by the forceps, though it was readily grasped, and was, to a certain extent, moveable. The region of the perineum seeming too limited to afford much scope for extricating the bone, I changed the plan of operation; and passing a probe into the highest of the femoral fistulae, dilated it very freely. Passing down my finger through the origin of the adductors, I came at last at a great depth upon the sequestrum. This, though readily caught by the forceps, could not at first be removed. The incisions were enlarged, a portion of the origin of one of the muscles was divided; the dead bone was then perceived partially surrounded by new bone. This was divided with cutting pliers, and then a piece of necrosed bone, of about the size of a filbert, was extracted. The operation was long and tedious, in consequence of the great depth from the surface, and the strong muscles through which a way had to be worked; but no ill result followed from the operation. The wounds went on healing kindly; and on May 3rd, the man returned home, the wounds granulating well, but urine still passing from them, especially from that in the perineum.

About a month afterwards, I heard that urine still continued to pass by the perineum; and since that time I have heard no more of this patient.

It is not, therefore, on account of the successful result that I have detailed this case, but as an example of the worst form of urinary fistula, caused by a portion of necrosed bone keeping up an amount of irritation that at length involved the urethra, and thus rendered the cure more difficult. I suspect that in this case considerable ulceration of the urethra had taken place. This, of course, could not be cured by the removal of the sequestrum; but the operation was justifiable, as removing the cause of the disease, and thus giving the only chance of ultimate recovery.

I have left myself little time to make any remarks, nor do I know that there is much to be said, except to point out once more that we occasionally have necrosis occurring in connexion with the cancelled extremities of the long bones, or in short bones, where it is not usually suspected; that it produces long-continued wasting discharge, and that (as in the last case) it may induce actual disease of important neighbouring organs, thereby still further obscuring the diagnosis, and rendering treatment less available. The first and last of the cases I have detailed obtained a place in my note book on account of the severity of the operations resorted to for their relief. But I ought to state that in this respect they form an exception to the ordinary run of such cases. The necrosed bone being detected, there is usually no difficulty in dilating the sinus and extracting it; and the second case presents, much more than the others, the ordinary characteristics of this disease, and of the operative procedure by which it is remedied. It is astonishing what an amount of constitutional disturbance the presence of even a small portion of necrosed bone may occasion; and though Nature is often sufficient of herself to throw off these extraneous parts, it sometimes happens, from the great depth from the surface, entanglement among muscles, or other causes, that this work falls to the share of the surgeon. A probe and a probe-pointed bistoury, a pair of dressing forceps are usually the whole of the armamentaria employed; but in case of need—i.e., when the sequestrum is partially enclosed in new bone—Hey's saw, Liston's forceps, and the trephine may all be required, as well as the powerful extracting instruments used by Mr. Fergusson, of London, and named the Lion forceps.

HYDROCELE OF THE TUNICA VAGINALIS: HÆMATOCELE: EFFUSION OF SERUM INTO THE CELLULAR TISSUE OF THE SCROTUM AND PENIS.

By A. G. WALTER, Surgeon, Pittsburgh, Pennsylvania, U.S.

ROBERT THOMPSON, 55 years of age, of Pittsburgh, a shoemaker by trade, of good constitution, temperate habits, and robust health, had had hydrocele of the tunica vaginalis of the left testis for fifteen years, which had gradually increased to a very large size, without giving him any annoyance but what its bulk occasioned. No cause for its appearance could be ascertained. In December last, whilst at work, preparing with the hammer a piece of sole leather upon a stone resting upon his knee, the stone slipped and struck the left side of the scrotum with violence, producing excessive pain and faintness. The shock, however, soon passed off, but not the pain; and increased swelling of the scrotum soon manifested itself. By evening both were aggravated; and during the night, more than twelve hours after the receipt of the injury, I was summoned to see the patient. I found him suffering excessive pain in the scrotum, spermatic cord, and lower part of the abdomen; his pulse was feeble and quiet; the hands and feet were cold; he had chilliness of the surface of his body, and nausea. The penis, whole scrotum, the region of the spermatic cord, and of the inguinal canal of the left side, were greatly swollen; the scrotum was hot, and of a brownish erysipelatous-like hue. The skin of the whole scrotum anteriorly, but more of the right side, and of the penis, was hard and indurated, the posterior wall of the scrotum being soft. The left inguinal region was greatly swollen and very painful, but the skin covering it was neither infiltrated nor discoloured.

Knowing that the patient had had hydrocele, and learning that he had been free from hernia, but had received a blow upon the scrotum while in a sitting posture, it was natural to suppose that rupture of the tunica vaginalis had taken place, and that the serum contained in its cavity had consequently been infiltrated in the cellular tissue beneath the skin of the scrotum, inguinal canal, and the penis. This would account for the swelling of those parts, but not for the discoloration of the skin of the anterior part of the scrotum, nor for the increased size of the scrotum, which was twice as large as it had been before the accident occurred. There appeared to be no other plausible supposition but that of extravasation of blood from rupture of some blood-vessel, in the cellular tissue along with the serum, in the tunica vaginalis testis, and in the inguinal canal; which was verified during the operation.

No doubt could be entertained about the proper treatment of the case. The skin of the scrotum had to be relieved of the excessive tension produced by the accumulated serum and blood, else sloughing would have followed. The tunica vaginalis of the scrotum and spermatic cord had to be opened; the extravasated and coagulated blood had to be turned out, else excessive suppuration would have ensued; and lastly, the bleeding vessel had to be secured, else extravasation of blood to an alarming extent might have taken place, with gangrene of the contents of the scrotum supervening, and thus jeopardising the life of the patient. The operation for hydrocele by incision of the scrotum was resorted to, while the patient was under the influence of chloroform. A free and long incision was made from below the groin to the bottom of the scrotum, over its anterior face, through skin and cellular tissue, which was found infiltrated with serum and coagulated blood. The tunica vaginalis, much thickened, was next divided to the same extent. On opening it, more than half a pint of straw-coloured serum was discharged; but its cavity did not collapse, owing to a large quantity of coagulated blood filling it, as well as that of the tunica vaginalis, funiculi spermatici, and of the inguinal canal. After the coagulated blood had been turned out, fresh and profuse arterial bleeding took place, proceeding from the mouth of a ruptured artery of the tunica vaginalis, which was found rent near the raphe, admitting the finger freely into the cellular tissue of the scrotum. Through this rent the blood had found its way into the cellular tissue of the whole scrotum and penis, causing the brawny appearance which those parts presented. The renewal of bleeding was caused by the removal of the coagulated blood, which had acted temporarily as a tampon upon the bleeding vessel. The spermatic vessels were found healthy and uninjured. Lint being placed upon the bleeding vessel, and into the wound, and a strip of adhesive plaster encircling the scrotum, arrested the bleeding. An