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CLINICAL REPORTS

OF THE

SURGICAL PRACTICE

OF THE

GLASGOW ROYAL INFIRMARY.

BY JOHN MACFARLANE, M. D.,

MEMBER OF THE FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW,

SENIOR SURGEON TO THE ROYAL INFIRMARY,

LECTURER ON CLINICAL SURGERY,

&c. &c. &c.

GLASGOW:

PRINTED FOR DAVID ROBERTSON;

ADAM BLACK, EDINBURGH; AND

S. HIGHLEY, LONDON.

1832.

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THIS VOLUME

OF

SURGICAL REPORTS

IS RESPECTFULLY DEDICATED TO THE

STUDENTS OF THE GLASGOW ROYAL INFIRMARY,

AS A TOKEN OF GRATITUDE FOR THEIR KINDNESS, AND OF SOLICITUDE

FOR THEIR PROFESSIONAL IMPROVEMENT AND SUCCESS,

BY

THEIR SINCERE FRIEND,

JOHN MACFARLANE.

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PREFACE.

Having ceased to act as one of the attending Surgeons of the Glasgow Royal Infirmary, it occurred to me that a plain and candid Report of the unsuccessful, as well as of the successful cases, which had been under my care in that Institution, might be useful to the numerous classes of students who attended me in my daily visits, and, probably, not unacceptable to some of the junior members of the profession. The short time that has elapsed since this resolution was formed, the pressure of other important avocations, and my anxiety to have the work completed as soon after the termination of my attendance as possible, are the only apologies I have to offer for so hurried and imperfect a performance. I have endeavoured, however, to give a faithful detail of all the cases of importance, appending to them such observations as they naturally suggested; and, at the same time, I have made an unreserved disclosure of all the adverse

occurrences which I have met with in Hospital, and when the subject admitted of it, even in private practice. All the operations which proved fatal are candidly recorded, and the causes of failure pointed out, from a conviction that by such details science is more likely to be benefited, and the surgical student improved and instructed, than by merely disclosing the "*cures*," however numerous or brilliant.

These Reports embrace but a very limited period; they include, however, the whole time of my attendance as junior and senior surgeon, viz., from 1st May to 1st August, 1826, when only one surgeon officiated, and the attendance was limited to three months; from 1st November, 1826, to 1st May, 1827, when the period was extended to six months, and two surgeons acted; and from 1st May, 1831, to 1st May, 1832, when the time of attendance was increased to one year, which arrangement is at present followed.

It cannot be denied, that the public at large, by whom our Hospitals are so munificently supported, and especially the medical world, are entitled to look to the Physicians and Surgeons of such establishments for the results of their experience, whether fortunate or adverse, in the shape of a periodical publication. Were such documents regularly furnished by the attendants of British hospitals, as is occasionally done upon the Continent, and thus made available to the profession, a mass of invaluable materials would be soon accumulated, which would far exceed in value

and importance all the isolated papers and cases with which the journals of the day abound. It is not, however, in the power of the surgeons to the Glasgow Infirmary to furnish any thing like an extensive Report, the period of their attendance being so limited as to prevent any single individual from obtaining that ample experience, or making that extended series of observations, which close and assiduous practice in an hospital for years can alone render important. Nevertheless, it is their duty to communicate the results of their experience, limited though it be; and should they not be able to give to the public much that is interesting or valuable, they may at least show that they have not been inattentive to the duties of the important office to which they have been appointed.

10*th July*, 1832.

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CLINICAL REPORTS

OF

SURGICAL CASES.

ON ANEURISM.

The surgical treatment of Popliteal Aneurism is now so well known, and the superiority of the Hunterian operation over every other plan of cure is so generally acknowledged, especially by British surgeons, as to render any observations which might be here advanced, in confirmation of these points, altogether superfluous. I shall therefore proceed, without any prefatory remarks, to detail those cases of this disease which have come under my own observation, and which tend to illustrate some peculiarity in its history, progress, and termination, or some untoward and unusual occurrence subsequent to the operation.

Case I.—*Aneurism of both Popliteal Arteries—Ligature of both Femorals—Gangrene of both Limbs—Death.*—A. M., seaman, aged forty-five, was admitted into the Royal Infirmary on the 11th of March, 1826, on account of a large aneurismal tumour in each ham. These, when first observed, seven months previously, were about the size of a walnut, and were seated in the upper and inner part of the popliteal space. They continued to increase gradually, but excited no uneasiness till a month ago, when they became so painful as to unfit him for his employment. The right tumour was

considerably larger than the fist,—had an irregular surface, an oblong shape, and stretched across the upper part of the ham, from side to side, but did not occupy fairly the hollow space behind the knee joint. It projected rather prominently at the edge of the inner ham string, and was partly covered by the tendons of the sartorius, gracilis, semi-tendinosus and semi-membranosus muscles. Its pulsations were strong and synchronous with those of the heart; but they immediately ceased, and the tumour became flaccid when the femoral artery was compressed. He complained of acute pain around the knee, which sometimes extended along the limb to the foot, especially after motion.

The tumour in the left ham, which was nearly of the same size, was in every respect similar to the opposite one, except by being less painful on pressure.

Had been affected for more than a year with violent and continued palpitation of the heart, and with painful throbbing in the epigastrium and opposite the umbilicus, as also of the carotids and other large arteries through the body. The pulse was eighty, full and jarring.

It was decided at a consultation, that, from the existence of apparently extensive disease in the vascular system, the case was extremely unfavourable for operation, and that therefore a strictly antiphlogistic treatment, consisting of rigorous abstinence, bloodletting purgatives, digitalis, and perfect rest in a recumbent position, should be adopted; whilst pressure was applied to the tumours, by means of bandages kept constantly wetted with a strong decoction of oak bark and alum. He left the Infirmary in two days; and, on the 16th of the same month, I was desired to attend him in his own house. He was then bled to the amount of a pound, and the other antiphlogistic remedies employed; but he could not tolerate the slightest pressure over the tumours. On the 22d, the venesection was repeated to sixteen ounces, and the other medicines increased. By these means the pulsation of the tumours was slightly diminished, whilst that of the femoral arteries, carotid, and *abdominal aorta*, was decidedly increased. The two former vessels could be traced in their whole course by the eye: they felt hard and tense, and the pulsation which they communi-

cated to the neighbouring parts was observed to extend over a larger space than natural. The right aneurismal tumour remained stationary, while the left increased in size and activity, accompanied by most acute pain in the knee and leg, for the alleviation of which, large doses of opium were necessary. The integuments at the upper edge of the ham string began to project in a conical form; and in a few days the central point, which had risen considerably beyond the level of the surrounding tumour, became inflamed and attenuated.

At a second consultation, on the 27th, it was agreed to tie the left femoral artery, which operation was performed on the 29th, in the upper third of the thigh. The vessel was readily exposed, appeared to be healthy, and of a natural size, and was secured by a single ligature; immediately after which, the tumour ceased to pulsate, and became somewhat flaccid. In half an hour he began to complain of pain in the left leg and foot, which soon became excruciating, and did not abate for nearly twenty-four hours, although three hundred and fifty drops of laudanum were administered to him in divided doses. The leg and foot became cold, and were therefore surrounded with flannel bags filled with heated bran. Slight swelling of the limb took place,—it felt rather hard and tense, and was exquisitely painful on pressure or motion. The opposite aneurism began to enlarge, to pulsate more violently than formerly, and to occasion a good deal of pain; and the vascular excitement in other parts of the body was at times powerfully increased, while again it would calm considerably, and remain so for several hours. These symptoms continued, with little variation, till the 2d of April, when a slight pulsation was felt in the anterior tibial artery at the left ankle. A livid spot was observed over the middle of the tibia, about an inch in diameter, and the surrounding integuments were slightly inflamed. The leg was tender, hard, and had its temperature but little diminished; whilst the foot was cold, destitute of sensation, and covered with dark-brown spots, but without vesication. On undressing the wound in the thigh, the greater part of it was found adhering.

In a few days the lividity had extended to the leg, and a large slough formed at the outer edge of the tendo Achilles:

the foot and ankle were cold and œdematous; the pulse was one hundred and twenty in the minute; the heat of the skin was increased; the tongue was furred; and the thirst urgent. The leg and foot were at this time in very opposite states of disease: the former had the action of its vessels morbidly increased, while the latter had its vitality nearly destroyed. The foot was therefore ordered to be frequently rubbed with a warm stimulating liniment, and the external heat continued; an evaporating lotion was applied to the leg; his bowels were freely opened; and he had two grains of opium every four hours.

On the 9th, the ligature separated, being the 12th day from the operation, and in two days more the wound was healed. The points of the toes, heel, and sole of the foot, were hard, shrivelled, and black, but he was still able to move them.

On the 15th, a dark erysipelatous redness commenced at the ankle, and extended to near the knee, which, after continuing three days, was removed by the application of camphorated spirit of wine. The internal malleolus and front of the ankle were covered with livid vesications,—the emaciation and debility were daily increasing,—the pulse was a hundred, and feeble,—the tongue was smooth and florid,—the fauces were covered with aphthæ,—deglutition was impeded,—and he complained of anxiety and restlessness. The aneurism in the right ham was increasing rapidly; and, as in the opposite limb previous to the operation, there now existed, on the inner side of the tumour, a part more prominent than the rest as large as a hen's egg, over which the integuments were thin, inflamed, and glistening. He was ordered a generous diet, consisting of animal food, wine, porter, &c.

On the 21st, the lividity of the foot and ankle was increasing; and, in consequence of acute pain in both limbs, he required to take, for several days, from six to ten grains of opium daily. It was not, however, till the 13th of May that the whole foot became involved in the gangrene. At this time the cuticle was detached, leaving the subjacent parts livid, flaccid, and emphysematous. There was a copious discharge of fetid sanious matter from the ankle, where a large slough had separated, exposing the tendo Achilles and front of the joint.

A large slough was also removed from the centre of the tibia, where the ulcerated parts were florid and granulating. He had no pain in the left leg, except at the line of separation, between the dead and living parts, to which poultices had for several days past been applied. The tumour in the left ham had diminished to the size of half an orange, and was firm and incompressible, but the right popliteal aneurism was increasing rapidly. It was now the size of a child's head at birth, and the skin covering the most prominent part of it was of a livid colour. It nearly surrounded the femur, and measured twenty-one inches; while the thigh immediately above was only nine inches in circumference. The leg was extensively œdematous and acutely painful; but the pulsations of the tumour were rather more obscure; and the throbbing of the subclavians, carotids, and abdominal aorta, was also lessened.

He was now anxious to have the right femoral artery tied, an operation which was proposed to him ten days before, with the concurrence of Dr. Burns, and several of my medical friends, but to which he then refused to submit. It could only be expected to produce a palliative effect, the case being evidently a hopeless one. It might, however, prevent the thin and inflamed integuments covering the tumour from giving way, and producing a fatal hemorrhage; and it might also tend to diminish the pressure over the popliteal nerve, to which the acute pain was to be attributed. Accordingly, on the 14th, I passed a single ligature around the right femoral, at the inner edge of the sartorius. It appeared considerably larger than the left femoral, but was otherwise healthy. He bore the operation well, and immediately on the ligature being tightened the pain ceased.

In the evening he was easy and free from pain. The leg was of a natural temperature, but the foot was cold, and covered with patches of a dark-brown colour. The œdema was lessened, and the tumour flaccid, but the integuments covering it were of a dark mahogany colour, and painful on pressure. The pulse was one hundred and eight, and throbbing; the pulsations of the heart and large arteries were greatly increased; and he complained of cough, difficult expectoration, and profuse sweats. He was ordered the cautious application of

heated flannel to the foot, acidulated drinks, &c., and a spirit lotion to the tumour. On the 15th, 16th, and 17th, he continued free from pain, slept occasionally by the use of opium, took some nourishment, and a little wine. The coldness extended from the toes to the middle of the leg, and the discoloured spots had become larger and more numerous. The sloughs were separating from the left foot, and the discharge was copious and fetid. He was greatly emaciated, and his face was anxious and hypocratic.

From this period till the morning of the 26th, when he died, he remained tranquil and free from pain. The gangrene of the right foot and leg gradually increased to within three inches of the knee, where it appeared to stop; but there was no line of separation visible between the living and dead parts. A large livid vesicle formed on the outside of the leg, extending from the foot to the knee, which discharged, when punctured, several ounces of an amber-coloured fluid. The integuments covering the tumour regained their natural colour, and the wound in the thigh adhered, but the ligature was not detached. The left foot was loose at the ankle, and appeared to be separating from the leg. Another slough formed over the middle of the leg, which, on separating, exposed two inches of the tibia, denuded of periosteum.

Inspection.—The right femoral artery was traced from the groin to the tumour; it was larger than natural, and its internal surface, particularly in the lower third of the thigh, was studded with yellowish coloured spots of a steatomatous texture. There was a small quantity of pus between the posterior part of the artery and its sheath where surrounded by the ligature, and at this point the vessel was obliterated. The aneurismal sac contained fully two pounds of fluid and coagulated blood. Its bottom and sides were lined with several firm fibrinous layers; but at the most prominent part, where the sac and integuments were exceedingly thin, there was no coagulated blood. The artery, as it passed through the triceps, and immediately above the commencement of the tumour, had a hard irregular feel, and readily admitted the little finger.

The left femoral artery was obliterated at the point to which the ligature had been applied; and a fourth of an inch

higher up, a small calcareous deposit was discovered between the external and middle coats. The aneurismal sac was thickened, and contained one ounce of fluid and coagulated blood. The left foot was gangrenous throughout; the ligaments of the ankle were destroyed, and the joint laid open, the tendons remaining entire. In the right foot and leg, the gangrene was confined to the integuments and superficial muscles.

The heart was soft, its cavities enlarged, and its coronary arteries thickened and hard. The aorta, both in the thorax and abdomen, was dilated to twice its natural size, but free of any aneurismal tumour. The enlargement was greatest from its origin in the left ventricle to about three inches below the arch. Externally it presented a dirty yellow colour, and felt hard, thickened, and irregular. When slit open, its inner surface was studded over with numerous hard yellowish tubercles of various shapes and sizes, which projected into the cavity of the tube, and rendered it rough and unequal. These projections were larger and more numerous around the openings of the arteria innominata, the subclavian and carotid of the left side, and immediately under the arch, than in any other situation. They were covered by the inner membrane of the artery to which they adhered intimately, and they varied in texture from the consistence of soft cheese to that of cartilage. The termination of the abdominal aorta, which had long been the seat of violent pulsation, was not more dilated than the other parts of the tube; and here the steatomatous spots on its inner surface were small, and few in number. The right iliac, at its origin, was larger than the left. With the exception of a small abscess in the superior lobe of the left lung, no other morbid appearance was discovered.

There are several practical points connected with the history and progress of this case which are not unworthy of notice. The spontaneous appearance of the tumours, their rapid increase, and their being for several months preceded by, and accompanied with, violent and continued action of the heart, and large arteries, indicated the existence of an aneurismal diathesis, and showed an extent and complication of disease in the vascular system, for which the best directed and most appropriate treatment must have proved inefficacious. It was therefore

determined to attempt to reduce the force of the circulation, by the usual antiphlogistic means, before an operation was had recourse to. This plan was not productive of the slightest advantage; on the contrary, the tumours increased, and the vascular excitement continued undiminished. But, notwithstanding this want of success, I am not inclined to coincide with those who maintain that, for the cure of aneurism, the antiphlogistic treatment is improper and injurious. I have frequently seen bleeding of advantage in arresting, or at least in retarding, the progress of internal aneurisms; and in cases where surgical aid is inadmissable, I would still be inclined to adopt it. It may happen, however, that its too frequent repetition shall be productive of injurious consequences. The action of the heart becomes increased, although the quantity of fluid circulating through the vessels is diminished: the blood is also rendered thinner, and its coagulation in the sac is retarded, upon which the natural cure of the disease so frequently depends. It has, I confess, rarely succeeded in obliterating the aneurismal tumour; yet, in circumstances otherwise so hopeless, it appears to be the only line of practice from which benefit can be expected.

In this case, to have immediately secured, by ligature, one or both of the femoral arteries, at the time the patient was admitted into the Infirmary, appeared to be a proceeding the propriety of which was doubtful. The tendency to disease in the arterial system was so great, that an operation might be expected to favour the formation of an aneurismal tumour in another part of the body, or give rise to secondary hemorrhage, should the femoral arteries be much affected where the ligatures would require to be applied. We had also to fear that gangrene of the limbs would be produced, either by the existence of disease in the arteries of the legs, or by the pressure of the tumours on the collateral branches around the knee,—both of which occurrences might have effectually prevented the re-establishment of the circulation. It may be said, however, that there would have been less chance of gangrene following the operations, had they been performed before the tumours had attained so large a size. It certainly holds good as a general rule, that the smaller the aneurism is,

when the artery with which it is connected is secured, the greater is the probability of success; but I am convinced, that with this patient the result would not have been otherwise than unfavourable, even had the operations been much sooner performed. The excruciating pain of the leg, which occurred immediately after the first operation, and which was gradually followed by gangrene, did not appear to depend on the size of the aneurismal tumour, but rather on a diseased state of the collateral vessels, by which they were prevented from yielding to the increased current of blood requisite for preserving the vitality of the limb. But after the second operation, which would have been performed sooner had the patient been willing to submit to it, the obstruction to the establishment of the collateral circulation was evidently owing to the enormous size of the tumour, which had increased very rapidly after the first femoral artery was tied.

There are two periods when the vitality of a limb is endangered, after its main artery has been tied for aneurism. The first is immediately after the operation, when, from disease of the anastomosing branches, or the pressure of the tumour, there exists an absolute impediment, or at least a very great obstruction, to the establishment of the circulation; and for this we use external heat, friction, &c. The second is more remote, and occurs after the circulation has been partially established. The circulation in the leg may, as in the case now detailed, be sufficiently active, whilst that of the foot is feeble and imperfect; and should it remain long in this state, there is a danger that the vascular activity in the parts above may be suddenly communicated to the foot, whose vitality is already so much impaired, and gangrene be the consequence. We attempt, therefore, when this combination exists, to bring the parts more into a state of equality, by diminishing the action of the leg, while the foot is moderately excited.

Case II.—*Popliteal Aneurism—Ligature of the Femoral—Erysipelas and gangrene of the limb—Amputation—Death.*—A. W., aged thirty-six, admitted 28th May, 1826.—The tumour, which was in the left ham, and had all the characters of an aneurism, was about the size of a turkey's egg, and could be

readily emptied by pressure, and it filled again with a whizzing noise, when the hand was removed. He first observed it; three weeks before, after walking sixteen miles, during which he was frequently seized with cramps in the calf of the left leg, followed by pain around the knee, and a sense of coldness at the ankle. His health was good, and the pulse natural.

Before submitting to an operation, he was freely purged, and kept in a recumbent position for a few days. The pain in the leg, but especially around the knee, was at times exceedingly severe, and prevented sleep; and although he was irritable and timid, the case appeared favourable for operation.

On the 2d of June, the left femoral artery was tied with a single ligature, in the upper third of the thigh. For several hours he complained of pain and coldness of the foot and ankle, which were removed by an anodyne and the application of warm flannel. After this the temperature continued natural, and the thermometer only indicated a difference of half a degree between the two limbs. The febrile excitement was, however, considerable; the pulse became quick and jerking, the skin hot, the tongue furred, and the countenance anxious. He had several doses of calomel and antimonial powder, followed by saline purgatives and diaphoretics.

When the wound was undressed on the 7th, its edges were tumid and suppurating, and the integuments on the front of the thigh, from the groin to near the knee, were affected with erysipelas. The leg and foot were of a natural colour and warmth, and the aneurismal tumour had nearly disappeared. The pulse was one hundred and sixteen, and sharp. He was bled from the arm to sixteen ounces; leeches were freely applied to the thigh; and he was ordered repeated doses of sulphas magnesiae, and tartris antimonii.

On the 8th, the constitutional symptoms were unabated; and the redness, swelling, and tension of the thigh had increased. The foot and leg were of a natural appearance; and he had only occasional pains about the ankle, which were removed by gentle friction with the hand. There was a small, inflamed, tumid, and painful spot over the tibia, about three inches below the knee: this was unconnected with the erysipelas

of the thigh; but to prevent it from spreading, leeches were applied to the part.

At this time it was evident that the collateral circulation was fairly established, but there was reason to dread the supervention of gangrene, should the erysipelas extend to the leg. This accordingly took place on the 10th, the cutaneous inflammation having spread from the knee to the ankle. The affected parts were swollen, tense, and painful; the face was flushed, the countenance anxious, the tongue brown, and the pulse above one hundred and twenty. Leeches were again applied to the thigh and leg, the spirit lotion continued, and two grains of opium ordered at bedtime. The cold lotion, which was cautiously applied to the leg, to moderate the inflammatory action, was productive of marked relief. Its effects were carefully watched; and it was ordered to be discontinued should it produce pain, or when the heat of the leg was reduced to a natural standard. But for such precautions, this practice, I conceive, was not altogether free from danger. Were the cold applications to be continued even for a short time after the indication for which they were ordered had ceased to exist, then the vitality would be either directly destroyed, or the parts be so chilled and enfeebled, as to render them unable to sustain the first increased action to which they were exposed.

On the 11th, the swelling of the leg had increased: it was covered in several places by large livid vesications, and the temperature was natural, but the foot was rather cold, and the toes livid. Pledgets moistened with camphorated oil were applied; the limb was enveloped in oiled silk; and he was ordered one grain of opium every four hours, three grains of quina three times a-day, with a nourishing diet, and a poultice to the wound, which was suppurating freely.

The lividity, vesications, coldness, and pain of the limb, gradually increased; and, on the 18th, a line of commencing separation between the dead and living parts was visible, about two and a half inches below the knee. The leg was covered by sloughs of an ash-grey colour, while the integuments of the foot and ankle were livid and hard. The countenance had a sunk and exhausted appearance, the tongue was florid, the pulse one hundred and four, and he was annoy-

ed with hiccup. In addition to the other remedies, he was ordered wine and brandy.

It was not considered advisable at this stage of the disease to recommend amputation, on account of the existence, in the front of the thigh, of a large suppurating cavity under the fascia, and extending from the groin to the knee. Besides, the following circumstances seemed to confirm the opinion that the gangrene was only superficial; and that although the patient would be exposed to danger after the sloughs were detached, from long continued irritation and profuse discharge, yet it might be possible to maintain the strength while this exhausting process was going on, so as ultimately to preserve a useful limb.

The livid appearance of the integuments, which first indicated the commencement of gangrene, soon disappeared from the leg, and the parts which were soft and porous assumed a greyish colour, and, except for a short time, retained their natural warmth. The power of moving the foot and leg was unimpaired: collections of pus formed under the sloughs, at a considerable distance from the superficial line of separations between the dead and living parts, which showed that the gangrene had not involved the whole limb.

On the 23d, the sloughs were removed from the leg, exposing the muscles in a state of healthy granulation; but it was yet doubtful to what depth the gangrene of the foot had extended. The ligature separated on the nineteenth day from the operation; and the wound, although clean and granulating, continued to discharge pus freely.

As his strength, notwithstanding the free exhibition of nourishment and cordials, was now evidently decreasing, and as the discharge from the leg was copious, amputation was proposed. He refused to submit, until the 6th of July, when, in consequence of acute pain in the leg, and his observing that the foot had begun to be detached at the ankle, he became anxious to have it performed, which was accordingly done, about three inches above the knee. On dividing the soft parts, it was found that the abscess in the fore part of the thigh had not only undermined the integuments, but had also extended among the muscles. Twelve arteries were tied;

and on removing the pressure from the femoral, blood was observed to issue freely from its divided extremity.

On examining the limb, the femoral artery was found healthy in size and texture,—the aneurismal sac was small, thin, and filled with a clot of blood, about the size of a walnut,—the muscles of the leg were healthy and vascular,—the foot was completely gangrenous,—the ligaments of the ankle were destroyed, and the joint freely laid open.

After amputation, he appeared to improve for several days; but on the 10th, when the stump was dressed, it was found open in the centre, and discharging an immense quantity of pus from the abscess. By these means, his strength was gradually destroyed: the undermined integuments ulcerated in several places, hectic supervened, and he died on the 12th of August.

In this case, there was not only extensive erysipelas of the thigh, which spread to the leg, and produced gangrene, but there was also diffuse inflammation of the subfascial cellular texture, commencing at the wound, involving the inner half of the thigh, and ending in profuse suppuration. It was the existence of this latter circumstance that prevented amputation from being earlier performed, and ultimately rendered it ineffectual. The case is also interesting, in so far as it shows the danger to the vitality of a limb, whose main artery has been tied, by the extension to it of inflammation from the neighbouring parts. I was at once aware of this danger, and employed the most active means, both local and constitutional, to ward it off, but unsuccessfully. The erysipelas (which disease was rather prevalent in the surgical wards at the time) extended rapidly to the leg, producing superficial sloughing of the integuments, and complete gangrene of the foot.

Case III.—*Popliteal Aneurism—Ligature of the Femoral—Hemorrhage on the nineteenth day—Cure.*—J. F., æt. forty-two, farm-servant, was admitted on the 5th July, 1826.—Five weeks before, he received a kick in the left ham, which produced severe pain, impeded his walking, and prevented him from following his usual employment. After two weeks, he became sensible of a tumour in the ham; when the pain of

the leg increased, and was combined with a feeling of numbness about the foot and ankle. The tumour, which pulsated distinctly, and could be emptied by pressure, was ill defined, and situated between the origins of the gastrocnemius externus. The leg was swollen, œdematous, and deformed about the centre of the tibia, where he had sustained a compound fracture fifteen years ago. His general health was good, and the pulse seventy-six.

On the 9th, the femoral artery was exposed at the inner edge of the sartorius, and tied with a single ligature. The external incision required to be larger than usual, on account of the great quantity of adipose substance, both under the integuments, and between the sartorius muscle and the sheath of the femoral vessels.

During the first twenty-four hours, the temperature of the left leg and foot was nearly two degrees higher than the opposite one. The limb was free from pain, swelling, and tension; and the superficial veins were prominent and well filled. Little or no febrile excitement took place: the wound adhered, except where the ligature passed out: the tumour became firm and incompressible, but diminished slowly.

On the 28th, at seven a. m., when attempting to get out of bed, a sudden gush of arterial blood took place from the wound, by the side of the ligature. It flowed, per saltum, to the amount of about eight ounces, and was arrested by pressure. A tourniquet was applied a little above the wound, and retained for a few days; whilst rest in the recumbent position was strictly enjoined. The ligature did not separate till the 4th of August, being the twenty-sixth day from the operation. There was no return of hemorrhage: the wound gradually closed, and he was dismissed cured in the beginning of September.

The aneurism was in this case to be attributed to external injury, the blow having probably lacerated the internal and middle coats of the artery; by which means the external yielded to the impetus of the circulation, and a sac was formed. The hemorrhage, which evidently proceeded from the femoral artery, showed that this vessel was not completely closed; and there was, therefore, a risk of its recurring as

long as the ligature remained attached. It was much longer of separating than usual; but, as the bleeding did not return, no ulterior measures were required.

Case IV.—*Aneurism of the right Popliteal and Anterior Tibial Arteries—Ligature of the Femoral—Return of Pulsation in both Tumours on the twelfth day—Cure.*—A. P., aged thirty-eight, farmer, applied to me for advice in the waiting room of the Infirmary, on the 12th November, 1826, on account of two tumours in the right leg. He did not intend to become a patient in the hospital, but, on learning that an operation would be required, he promised to remain in town, and requested my attendance. He was a healthy and robust man, and first observed a small pulsating tumour on the fore part of the right leg, about six inches below the knee. It was exactly over the course of the anterior tibial artery; seemed deep seated, ill defined, and about the size of a walnut. It pulsated distinctly, and could be partially diminished by pressure; and its pulsations were readily arrested on compressing the femoral. About five months after the appearance of this tumour, which he attributed to a blow he had received on the part, he began to complain of pain and stiffness in the knee, which gradually produced lameness. He then discovered a tumour in the ham, about the size of a pigeon's egg; which, at the time I saw him, was as large as an orange, and had all the characters of an aneurism. The foot and leg were slightly œdematous; and the pain, which had latterly extended to these parts, was so excruciating, that he was often obliged to assume a recumbent position, and to elevate the leg considerably above the level of the body, before it was mitigated. The pulse was natural; and, after a careful examination of the heart and large arteries, no other disease could be discovered.

On the 15th, I proceeded to expose the right femoral artery in the upper third of the thigh, where it is crossed by the sartorius, and passed a single silk ligature around it. The moment this was firmly secured, the pulsations of the tumours ceased: both ends of the ligature were cut off close to the knot: the edges of the wound were brought together by

adhesive plaster, and a few turns of a bandage applied to the thigh.

Everything went on favourably: the heat of the limb was preserved,—the œdema speedily disappeared,—the pain was only slight and occasional,—the tumours became softer and smaller,—the wound adhered by the first intention,—and the febrile excitement was moderate.

On the 27th, I was hurriedly sent for in the morning, the patient having been alarmed during the night on discovering that both tumours were pulsating. He had been induced to lay his hand on the tumour in the ham, from having felt a return of the painful sensations about the knee, similar to those he experienced previous to the operation; and he stated that the pulsation of the popliteal tumour was then distinct, but that two hours elapsed before he could discover it in the anterior tibial one. Both tumours had regained their former size, but the pulsation was more obscure in the lower than in the upper one; in both, however, it could be easily stopt by compressing the inguinal artery. As his pulse was full and strong, I immediately bled him to syncope,—ordered the frequent use of nauseating doses of emetic tartar,—applied a graduated compress and a roller to each tumour, over which two small bags, composed of waterproof cloth, and half filled with pounded ice, were secured. These were repeatedly renewed, and a great degree of cold produced, without the slightest pain or inconvenience to the patient.

On the 4th day, I removed the compresses, in order to ascertain if the pulsation still continued. I was gratified to find that it had completely ceased in both tumours, which were somewhat flattened by the pressure, and had a firm feel. The compresses and bandage were re-applied, though less firmly: the bags of ice were discontinued, but the antiphlogistic treatment was persisted in for several days longer. He was kept in bed, and on spare diet, till the middle of January; by which time the tumours had diminished more than one-half, and he was greatly reduced in flesh and strength.—When I saw him last, about a year ago, he was in excellent health, and the remains of the aneurismal tumours could hardly be discovered.

The fact, that more than one aneurism may exist in the same

individual, unconnected with general disease of the arterial system, is obvious from the detail of the preceding case. The causes which seemed to give rise to the formation of both the anterior tibial and popliteal tumours, were of a local kind; and the case was more favourable for operation than the one which I first detailed. There was some reason to suppose, however, from the existence of two aneurisms, so near to each other in the same limb, that there was a partial disposition to disease in the coats of the affected vessels. But had the arteries of the limb been generally diseased, an occurrence which the age and robust health of the patient rendered improbable, the ligature of the femoral would have been followed by imperfect collateral circulation and gangrene.

When aneurism of the anterior tibial artery is situated in the upper part of the leg, the circulation of blood through it is generally commanded by compression of the femoral,—and ligature of the latter vessel is usually successful in effecting a cure. The return of the circulation to both tumours on the twelfth day after the operation, does not militate against this opinion. The pulsation first commenced in the popliteal tumour, where it continued for two hours before it was discovered in the anterior tibial one; it must, therefore, have been owing not to a direct communication with any large collateral branch proceeding from the upper part of the thigh to the leg, but to the existence of some large arterial branch, originating higher up than the place to which the ligature was applied, and terminating in or close to the popliteal sac. The same thing happened to the late Dr. George Monteath, of this city, in a case of popliteal aneurism; but in his patient the pulsation was much longer of returning after the femoral was tied, and the cure was more protracted.* Sir E. Home, in detailing some of the cases operated upon by Mr. Hunter, also states that the popliteal tumour frequently continued to pulsate after the femoral was tied; but that this circumstance did not generally interfere with the cure of the disease; as he found that, in most instances, a cure was produced by simply diminishing the force of the circulation through the aneurismal artery, without

* *Vide* appendix to Wishart's Translation of Scarpa on Aneurism—2nd Edition.

its being altogether obstructed.* I was unwilling, however, to trust to the occurrence of this natural termination in the treatment of the case which I have now detailed; and I therefore proceeded, so soon as the return of the pulsation was discovered, to subdue it by local and constitutional means, which were fortunately successful.

Of late, an attempt has been made by Mr. Wardrop to revive the operation of Brasdor for the cure of aneurism. This operation, which consists in the application of a ligature on the distal, instead of the cardiac, side of the sac, was recommended and practised several years ago, both in this country and in France; but the result was uniformly fatal. It has since succeeded in the hands of Mr. Wardrop;† but it appears very doubtful if it shall ever become one of those established operations to which we can confidently have recourse in cases where the Hunterian method is inadmissible. I have no intention of entering here into a detailed examination of its merits or demerits: I have only been induced to allude to the subject, for the purpose of shortly stating a case of aneurism at the root of the neck, for the cure of which, I was strongly urged, by several of my medical friends, to have recourse to Brasdor's operation. I declined to follow this advice, because I could not satisfy myself, even after repeated and careful examinations of the particular vessel implicated in the disease.

Case V.—*Aneurism of the Arch of the Aorta mistaken for Aneurism of the Innominata, or of the Root of the right Carotid.*—Mrs. C., aged fifty-eight, was admitted into the Infirmary on the 4th of February, 1826, on account of a fracture of the neck of the thigh-bone. She remained in the house for several months, and came under my care on the 1st of May following. On the 20th of that month, she first called my attention to a small pulsating tumour above the sternal end of the right clavicle, which she had observed four weeks before. It appeared suddenly, and was preceded by a peculiar sensa-

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* Transactions of a Society for the Improvement of Med. and Chirurg. Knowledge.

† On Aneurism and its Cure, by a New Operation. London, 1828.

tion, as if something had given way at the part. It gradually came to project above the level of the sternum, following exactly the course of the right carotid for about two inches, and spread in a lateral direction across the front of the trachea, to the inner edge of the sterno-mastoid muscle of the left side. Its pulsations were strong, synchronous with those of the heart, and visible at a considerable distance. She had occasional attacks of dyspnœa and cough: the action of the heart was excited, and the pulse full and throbbing.

It was impossible in this case to point out the exact seat of the disease. By some it was supposed to be confined to the root of the right carotid; by others the arteria innominata was fixed upon as the affected vessel. There could be no doubt that the tumour was aneurismal; but no person, with anything like accuracy, could point out the vessel to which it was confined. It seemed to dip under the sternum, and had more the appearance of an enlargement of the arteria innominata than of the carotid. In either case, the admirers of Brasdor's operation might have been inclined to have had recourse to it. The obscurity in the diagnosis, and the tolerably good health the patient enjoyed, made me averse to its performance.

She left the Infirmary about the middle of June, and I heard nothing more of her till I was requested to be present at the inspection of her body in the month of December following. She died of serous apoplexy; but, of course, the chief attention was directed to the state of the vessels at the root of the neck. On removing the lungs, and proceeding to examine the aorta, and its chief branches, I was rather astonished to find that the arteria innominata, and the roots of the right carotid and subclavian, were of a natural size, and that the tumour which had existed during life was an aneurism of the arch of the aorta. The sac, which was of a pyriform shape, and filled with coagulated blood, passed obliquely across the arteria innominata, and ascended under the sterno-mastoid in the course of the right carotid. The roots of the carotid and subclavian appeared to be in some degree compressed by the tumour, but they were not obliterated.

It is hardly necessary to state, that had an operation been performed in this case, it would not only have been useless, but

decidedly injurious. I am afraid we must expect to encounter many such disappointments, until we can establish a more accurate diagnosis. It is chiefly as a caution against the indiscriminate adoption of Brasdor's operation for aneurism at the root of the neck, that I have thought proper to narrate this case.

Case VI.—*Aneurism apparently of the left Subclavian, and also of the Root of the right Carotid—No Operation.*—J. D., aged fifty-two, labourer, admitted 24th June, 1831. The subclavian fossa on the left side was filled by a firm elastic tumour, about the size of half-an-orange, which projected beyond the level of the clavicle, and was the seat of strong and loud pulsations, synchronous with those of the pulse, and accompanied by "bruit de souflet." Between the outer edge of the sterno-mastoid and the tumour, there was a free space of about half-an-inch, where the subclavian was felt beating; but although this vessel was firmly compressed in this situation, the pulsations of the tumour were not arrested. There was also an ill-defined swelling extending from the upper edge of this tumour, backwards and upwards, for three inches, nearly along the margin of the trapezius. About the middle of this diffuse swelling, and on a line with the centre of the aneurism, there was a small spot which the finger could cover, where a peculiar whizzing sound was heard, either with the naked ear, or by means of the stethoscope, apparently as if there existed a small opening in the upper part of the aneurismal sac, through which the blood was forced into the surrounding parts. The action of the heart was greatly increased, and extended over a larger portion of the chest than natural; and there was a small oblong pulsating tumour under the sternal portion of the right sterno-mastoid muscle, seemingly caused by a dilatation of the root of the right carotid. The pulsation of the left humeral and radial arteries was perceptibly weaker than that of the same vessels in the opposite arm;—complained of numbness in the left arm, and of constant, obtuse, deep-seated pain in the left side of thorax, between the lower angle of scapula and spine.

These symptoms were of twelve months' duration, and were

attributed to severe exertion; but he only observed the tumour about two months before his admission, and since then it had not increased.

On the 26th of June, it was decided, in consultation, that, from the robust health of the patient, and the violent action of the heart and large arteries, smart antiphlogistic treatment should, in the meantime, be adopted. During the three subsequent weeks he was bled five times, to the amount of sixty-two ounces,—had repeated doses of saline purgatives, digitalis, &c., and was kept on low diet. These means had a partial effect on the circulation: the pulse at the wrist became smaller and more feeble; but the action of the heart and large arteries was only slightly diminished. The subclavian tumour gradually extended upwards, nearer to the sterno-mastoid, as well as outwards, beyond the level of the clavicle; and the bellows' sound became louder and more distinct. The pain between the shoulders was often most distressing; and he complained of a violent pulsation in the part, which frequently prevented his sleeping, but was not relieved nor aggravated by any particular position. When the stethoscope was applied to this part, the sound of the heart was discovered louder, and the impetus much stronger than natural.—He left the hospital on the 8th of August, contrary to my desire, and I have not heard of him since.

This patient was seen by a great many surgeons, both British and Foreign, and all agreed as to the disease being an aneurism of that part of the left subclavian artery which lies over the first rib. The only thing which appeared to me to militate against this opinion, was the fact, that the pulsation of the tumour could not be arrested by compressing the subclavian between the disease and the heart. I am not aware that this circumstance has ever been encountered in a decided case of subclavian aneurism, nor am I satisfied that it can actually occur. When the tumour is small, and portion of sound artery between it and the heart can be reached with the finger, and readily compressed, it is but natural to suppose that the pulsations of the tumour should be arrested. When this cannot be accomplished, it is not improbable that the aneurism, in place of being subclavian, originates from the

aorta. A case of this kind occurred to the late Mr. Allan Burns;* and it was found, on dissection, that what was previously supposed to be a subclavian aneurism was an aortic one. The progress of the disease is minutely related; but there is no mention made of the effect of compression of the subclavian upon the pulsations of the tumour. This appears to me to be the most likely of all the symptoms in a dubious case to lead to a correct diagnosis.

Besides the aneurismal tumour in the course of the subclavian, there was also, apparent to the eye, and easily felt by the hand, an incipient aneurism of the root of the right carotid, which was of an oblong shape, and pulsated violently. This, although indicating the existence of an aneurismal tendency in the system, did not present a serious obstacle to the application of a ligature to the subclavian; because it is well known, that the coats of any of the large arteries may be so considerably dilated as to produce a distinct pulsating tumour, which may remain in this state for years, without giving rise to an aneurismal sac, or to the necessity for an operation. The probability of disease in the heart, or of an aneurism below the arch of the aorta, existing, and giving rise to the violent pain and pulsation between the scapulæ, were the circumstances of the case most inimical to operation. But for the existence of these unfavourable symptoms, and the obscurity regarding the real seat of the aneurismal tumour, ligature of the subclavian would have been performed. It would certainly have presented considerable difficulties, from the smallness of the space and the depth of the artery, but these could not have been such as to have deterred from its performance any surgeon possessed of the requisite coolness and anatomical knowledge. These difficulties could have been in part obviated by dividing a portion of the clavicular attachment of the sterno-mastoid muscle, and still farther by dividing the outer third of the scalenus anticus, as has been had recourse to in similar circumstances.

I have probably dwelt longer on this case than I ought to have done, considering that no operation was had recourse to,

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* Surgical Anatomy of the Head and Neck, by Pattison.—Lond. 1824, p. 62.

that the disease was obscure, and that its termination has not yet been ascertained; but, as it excited a good deal of attention, and was in several respects interesting, I have deemed it proper to place it on record.

That species of aneurism by anastomosis to which the appellation of nævus is applied, is a disease now often met with in children. During my attendance at the Infirmary I have seen above thirty cases, the majority of which were treated as out-patients, and have had opportunities of comparing the merits of the different plans of cure which have at various times been adopted. In shortly noting the size and other external characters of these tumours, I was careful also to preserve a description of their exact situation; and I find, in reference to this point, that more than two-thirds of them were confined to the anterior aspect of the body, and that considerably more than a half were situated on the head and face. All of these, except one, were observed at birth,—grew with greater or less rapidity, and varied in extent from about a quarter of an inch to fully three inches in diameter. They all projected more or less beyond the level of the surrounding parts; and, in a few cases, ulceration of the thin integuments with which they were covered took place, giving rise to troublesome hemorrhage. In three of these there was gradually projected from the ulcerated surface a fungous tumour, which rapidly increased, assumed a pyriform shape, bled on the slightest touch, and appeared to possess all the characters of the original disease. When ulceration does not take place, then the superjacent skin, by the morbid enlargement of the subcutaneous vessels, is gradually and unequally elevated; but it is seldom that the diseased mass extends more than an inch beyond the level of the adjoining healthy parts. I have seen two cases, however, in which the disease did not increase in breadth, but continued to project, while the integuments were entire, so as to form livid and pendulous tumours.

Case VII.—*Aneurism by Anastomosis—Tumour Pendulous—Cured by temporary Ligature.*—A child, eight months old, was brought to the Infirmary to have a pyriform tumour removed from the edge of the under lip. It was, when observed at

birth, about the size of a split pea, of a livid colour, and on a level with the surrounding integuments. It remained stationary for the first three months, after which time it began to increase rapidly, and to project in a pendulous form. The integuments were entire: the apex of the tumour, which was about the size of a walnut, was irregular and doughy; whilst the neck, which was not larger than a quill, was hard and smooth, and the pulsations of its vessels were distinctly preceptible. A broad ligature of tape was firmly applied, close to the base of the tumour, and removed in twenty-four hours. I did not intend to allow the ligature to remain till ulceration of the pedicle was produced; but only, by obstructing the circulation for a few hours, to cause coagulation of the blood, and in this way to attempt to destroy the vitality of the tumour. It was, with the use of cold, perfectly successful: the tumour sphacelated, and the portion of lip to which it was attached speedily cicatrized.

I was induced to try the temporary use of the ligature, from having met with another case of this disease, in which, by the usual mode of its application, violent convulsions were produced.

Case VIII.—*Aneurism by Anastomosis—Ligature of the Tumour—Convulsions—Cure.*—A child, nine months old, had a tumour, about the size of a grape, over the anterior superior angle of the left parietal bone, which had all the characters of aneurism by anastomosis. A needle, armed with a double ligature, was passed under its base, and each half of the swelling was tightly tied, so as to cut off its supply of blood. The child was teething: it cried bitterly, and was fretful and uneasy for several hours. During the following night it had an attack of convulsions, which continued for fifteen minutes, and returned with undiminished violence after an interval of two hours. The ligature was immediately removed, and the convulsions ceased. In four days the tumour sloughed, and a cure was speedily accomplished.

Case IX.—*Aneurism by Anastomosis—Ligature of the Tumour followed by Hemorrhage—Cured by actual Cautery.*—W. H., aged seven months, had a soft, unequal, purple-coloured tumour, about the size of half-a-crown, on the anterior surface of the left

arm, two inches above the elbow-joint. It was elevated a little above the surrounding parts; and when firmly compressed, an obscure thrilling, or slightly pulsatory sensation, was perceptible. It was tied with a double ligature, as in the last case, and in six days the tumour separated. The exposed surface, which had at first a sloughy appearance, soon became clean and florid; and, except a small spot in the centre, it was evident that the diseased structure was completely destroyed. Here, however, a large spongy tumour formed, which was of a dark colour, and bled profusely. Pressure, by means of a compress and bandage, the free application of nitric acid, caustic, &c., were ineffectual in checking its progress. The actual cautery was at length had recourse to; and by four applications of it, the morbid growth was destroyed, and a cure accomplished.

In this case, it is probable, although the ligatures were carefully introduced under the base of the tumour, and firmly tied, that the whole of the diseased mass was not included. Even when this does happen, it is seldom that the disease is reproduced, as the enlarged vessels on which it depends become obliterated to some distance below the point at which the ligature is applied.

Whatever is capable of exciting inflammation in these vascular tumours, and of producing either ulceration or consolidation of their loose texture by the effusion of lymph, may put a stop to their progress, and ultimately lead to a cure. For this purpose, I have used vaccination with success in five cases; and in one case, where the disease extended over the whole surface of the lower eyelid, and where neither the ligature nor the knife could be employed without producing deformity, I succeeded in exciting inflammation of the tumour, by introducing a seton close to its base, and retaining it till partial suppuration was established. In another case, where the disease was confined to the inside of the lower lip, the seton proved unsuccessful, and ligatures had to be employed.

ON TUMOURS.

There are few subjects of greater importance to the practical surgeon than that which refers to the origin and growth, as well as to the peculiarities and treatment, of Tumours. In detailing those cases which were under my care in the Infirmary, the classification of Abernethy, which is founded on the anatomical characters of the disease, shall be adopted; but, for the sake of more accurate and familiar illustration, I shall adhere to the following arrangement:—

1*st*, *Tumours of the Head and Neck.*
2*d*, *Tumours of the Mamma.*
3*d*, *Tumours of the Abdomen.*

I.—TUMOURS OF THE HEAD AND NECK.

From the firm and condensed state of the cellular texture of the scalp, we find that the formation of adipose tumours in this situation is of comparatively rare occurrence. I have seen a few cases, however, two of which I shall shortly detail: in one, the disease was confined to the subcutaneous texture; and in the other, the tumour was covered by the occipito-frontalis.

Case X.—*Adipose Sarcoma on Head—Extirpation followed by Erysipelas—Cure.*—W. J., æt. fifty-four, had a large, prominent, well-defined, and doughy tumour, about the size of a small orange, situated over the centre of the left parietal bone. Its origin was attributed to a blow he had received on the part about three years before, and since that time it had been slowly increasing. It was freely moveable over the subjacent parts, but firmly adherent to the integuments, which retained their natural colour. Its surface was traversed by several enlarged veins. It was broader and more expanded at the apex

than at the base; and it only gave him pain when compressed by the hat, or when otherwise subjected to external irritation.

As this tumour had all the external characters of adipose sarcoma, it was extirpated from the subcutaneous cellular tissue, to which it was confined, and found to possess the structure peculiar to this class of tumours. It was enveloped in a fine cyst; and in the centre the adeps was considerably condensed, so as to give the part a hard feel. There was a good deal of venous hemorrhage, but only one artery required a ligature.

This patient was seized on the third day after with a smart rigor, followed by erysipelas, which commenced at the wound, and extended over the scalp and face. The febrile excitement ran high: there was considerable cerebral disturbance, and for several days he was in a dangerous state. Leeches and cold applications were freely used to the affected surface. Free vomiting and purging were produced, and maintained for some time by the emeto-cathartic mixture. Towards the end of the disease, when typhoid symptoms manifested themselves, and the delirium became low and muttering, the solution of the carbonate of ammonia was of great advantage. The edges of the wound separated, as usually happens from such violent local and constitutional disturbance, and superficial sloughing took place; but soon after the cessation of the erysipelas, the part assumed a healthy aspect, and cicatrized rapidly.

In the preceding case, the patient left the Infirmary the day after the tumour was extirpated, and was exposed to cold and fatigue, which were probably the exciting causes of the erysipelas. This affection is exceedingly apt to supervene on wounds and other injuries of the scalp, however slight and trivial they may be. In whatever manner these may be treated, erysipelas may supervene; nevertheless, I am satisfied that where sutures are employed for retaining the edges of the wound in contact, this unmanageable and frequently dangerous disease is more apt to occur than when the ordinary dressings are had recourse to. The smart antiphlogistic treatment, adopted in the last case, is the one which I have found most generally successful. I have lately

had an opportunity, in erysipelas succeeding to a small punctured wound of the scalp, of trying the local application of the nitras argenti to the inflamed surface, as recommended by Higginbottom, which proved successful in arresting the disease.

Case XI.—*Adipose Sarcoma on Head—Tumour developed under the Occipito-frontalis—Operation—Cure.*—J. G., æt. forty-seven, had had a soft, flat, ill-defined tumour, growing over the centre of the occipital bone, for about five years, when he applied at the Infirmary to have it extirpated, in August, 1831, and for which he had previously used a variety of local applications without benefit. On proceeding to remove it with the knife, I found it covered by, and intimately adhering to, the occipito-frontalis muscle, which was much thickened. The wound healed without difficulty, and no untoward occurrence took place. On dissecting the tumour, it was found to be composed of adipose matter, contained in a distinct cyst, and much flattened in shape by the resistance to its development, produced by the tendinous expansion under which it was situated.

The difference in the external size and prominence of the tumours, in the two last cases, was very great, and depended on the slight resistance which the one encountered to its external growth, compared with the firm and unyielding covering by which the other was bound down. The one was prominent, well-defined, somewhat pyriform in shape, and would soon have become pendulous; while the other was broad, flat, and appeared to blend gradually with the surrounding parts.

The scalp is peculiarly liable to become the seat of encysted tumours. These are capable of being removed by a very simple and easy operation; and, as they are to be met with almost daily in practice, I shall not now enter into a narration of cases to illustrate either their size, situation, or the varying nature of their contents. I shall only adduce the following case, to show that a simple tumour of this description, although it has been long benign, may yet, in process of time, become malignant. Before doing so, I may state that I have seen other two cases of a similar kind. In one of these, amputation of the penis for cancer had been resorted to, a few

months before the tumour on the head assumed the appearance of malignancy. This patient ultimately died, in consequence of the disease being propagated to the inguinal glands.

Case XII.—*Encysted Cancerous Tumour of the Scalp—Extirpation—Cure.*—A. M'D., æt. sixty-five, entered the Infirmary on the18th June, 1826, to have a tumour removed from his head. It was situated over the centre of the left parietal bone, to which it adhered intimately, and was about the size of a pigeon's egg. It was deeply ulcerated; the edges were thickened and everted; the surface had an irregular cauliflower appearance; the discharge was ichorous; and the pain acute and lancinating. This tumour had existed for eleven years in an innocent state, similar to other two of the common encysted kind, on the opposite side of the head; when, after a bruise, it became painful, inflamed, and ulcerated. It was extirpated; but on the third day erysipelas supervened, and extended rapidly over the head and neck. It being impossible to preserve integuments to cover the wound, it was some time before it granulated and cicatrized. I have seen this patient repeatedly since, and have not observed any tendency to a return of the disease, which was evidently of local origin.

There is probably no part of the body where tumours form so readily as in the neck, and where surgical interference is more frequently required for their removal. The dangers and difficulties to which their extirpation may give rise, will depend much on their peculiar situation, and on the depth and extent of their subjacent connexions. Those tumours which are formed exterior to the platysma myoides are not prevented from increasing externally,—which they sometimes do, to a great size,—but they rarely acquire any deep-seated attachments, or come to interfere with the functions of any of the important parts belonging to this region of the body. They can be, therefore, readily extirpated; and even when they are large, and have a broad and extensive base, it is seldom that the dissection requires to be carried beyond the fascia to which they are attached. I have seen a pendulous adipose tumour occupying the left side of the neck, and fully the size

of a child's head, extirpated with great ease from the surface of the platysma myoides, the only inconvenience having arisen from venous hemorrhage.

When, however, a tumour is developed behind the fibrous investments of the neck, and especially when it is deeply situated at the angle of the jaw, its removal by the knife becomes both difficult and dangerous, on account of the importance of the vessels and nerves to which it may have formed attachments. To illustrate this, and some other points connected with the history, progress, and variety of such tumours, the following cases are recorded:—

Case XIII.—*Encysted Tumour over the Right Parotid Gland—Extirpation—Salivary Fistula—Cure.*—J. S., æt. twenty-four, admitted 10th December, 1826. First observed, about eighteen months before, without any evident cause, a small elastic tumour, below the lobe of the right ear, and between the angle of the jaw and the mastoid process of the temporal bone. It was globular, had an elastic fluctuating feel, was larger than a hen's egg, and free of pain, even when roughly handled. It was covered by healthy integuments, and appeared to dip rather deeply, and to impede the free movement of the lower jaw.

This tumour was evidently encysted, and its contents of a fluid kind. It was agreed to have it extirpated, although it was believed, by one of thes urgeons who examined it, to be a chronic abcess. But, from its slow and gradual formation, and from the absence of pain and discoloration, it was probable that the contained fluid was either serous or melicerous, and on this account I determined on dissecting out the cyst.

After turning back the integuments which covered it, the cyst was found firmly bound down by the fascia, which was divided around the base of the tumour. When more than one-half of it was detached, the anterior part of the sac was accidentally opened by a hook, with which an assistant was raising up the tumour, when a considerable quantity of limpid fluid was discharged. The relaxed cyst, which was found adhering intimately to the outer edge of the masseter muscle, to the angle of the inferior maxilla, to the anterior edge of the

sterno-mastoid muscle, to the parotid gland, and to the cartilage of the external ear, was then separated, leaving a deep cavity behind the angle of the jaw. On its being dissected from the parotid, a small portion of the capsule was removed, and the granular texture of the gland exposed. Four arteries were tied, and the edges of the wound retained in contact by adhesive plaister, over which a firm compress and a double-headed roller were applied.

On the sixth day after the operation, the bottom of the wound was observed to be sloughy, and its edges tumid, inflamed, and separated. Soon after this, it was discovered that erysipelas had begun, which extended rapidly over the face and head, but without being accompanied by much febrile excitement.

On the 21st of the following month (January), she was dismissed, with the wound healed to a mere point; but without any discharge of saliva from the part, or the slightest appearance of a fistula forming. The next time I saw her was in November, 1829, when I found that, in three weeks after leaving the Infirmary, she became subject, during mastication, to profuse discharges of watery fluid, through a small opening in the centre of the cicatrix, which had never healed. By applying the nitras argenti freely and frequently to the fistulous opening, and to the surface of the parotid gland from which the saliva flowed, and by the use of firm and continued pressure, for some weeks,—by means of graduated compresses and a bandage,—a cure was accomplished.

We are told by Burns,* that the inferior lobe of the parotid gland may become sacculated, so as to give rise to a tumour behind the angle of the jaw, formed by an accumulation of saliva. When this happens, I presume we are entitled to expect that there shall be a direct communication between the gland and the cyst; for upon no other principle can we account for the gradual increase of saliva, which must take place as the tumour enlarges. Should this explanation hold good, then it follows that in the above case the tumour was a common encysted, and not a salivary one, attached to, but not

* Surgical Anatomy of Head and Neck—p. 302.

incorporated with the parotid gland; because, on examining the cyst, which was removed entire, there was no opening found on its posterior surface by which fluid could be conveyed to it from the parotid. This opinion is not invalidated by the subsequent occurrence of fistula, which owed its origin to the accidental injury of the gland during the removal of the cyst.

The following case is interesting, as it shows the indolent nature of a chronic abscess, the equivocal characters which it sometimes assumes, and the necessity of a careful and accurate examination of every obscure and dubious tumour, before its removal by the knife be attempted.

CASE XIV.—*Chronic Abscess in the Neck—Cured by Puncture.* —C. M'P., æt. twenty, admitted 12th April, 1832, having been sent by a surgeon, from the Island of Mull, to have a tumour extracted from her neck. It was seated in the left side, having the sterno-mastoid muscle for its anterior and the trapezius for its posterior boundary. It dipped under the middle of the clavicle, and extended to within an inch of the mastoid process of the temporal bone. It was covered by sound integuments, and had a firm resisting feel, except a small spot in the centre, where obscure fluctuation was discovered. When first observed, a year and a half before, it was about the size of a pea. It increased slowly, but never was the seat of acute pain. Her general health was good, and her habit apparently free from struma.

On the 15th, I submitted this woman to a consultation, when several different opinions were given as to the nature of the tumour. One gentleman advised immediate extirpation, from a belief that it was of a solid structure. I was convinced that it contained fluid, and ought to be punctured. This was done, and seven ounces of healthy looking pus evacuated. The sac was gradually filled by granulations, and a cure accomplished.

When an encysted tumour forms in the subcutaneous cellular texture, the fluid nature of its contents can be easily ascertained; but when it is situated below the fascia, its pro-

gress externally will be considerably impeded, and the sense of fluctuation rendered much more obscure. Even in this latter situation, however, the nature of the tumour may be correctly ascertained by careful and deliberate examination, except when the cyst is greatly thickened. But it sometimes happens that the cyst, although thin, is so completely distended with the fluid, as to give the tumour a hard, tense feel. When a tumour, so distended, is situated in the abdominal parietes, I have seen expert Surgeons foiled in detecting fluctuation, because they could not fix it against any hard resisting body, so that the requisite degree of pressure might be applied. It is still more difficult to ascertain, before it has been punctured, whether the sac contains pus or serum. Every surgeon of common observation must have seen chronic abscesses in which little or no pain was present, and where months elapsed before the tumours attained to any great size. In such cases it is hardly possible, by external examination or by accurate attention to the history of the disease, to know whether the tumour is filled with pus or serum. Nor is the distinction, in general, of much practical importance.

Case XV.—*Tumour in left side of Neck—Medullary Sarcoma?—Operation—Cure.*—M. S., aged forty-six, was admitted on the 5th of February, 1827, and the following particulars of her case entered in the journal:—

"There is situated over the angle of the jaw, on left side, a tumour, considerably larger than the fist, which extends from the edge of the sterno-mastoid muscle, as far forward as the chin. It has an irregular shape; is distinctly lobulated on the surface, to which the integuments are firmly adhering; projects considerably, and is somewhat flattened on its summit. It has a firm, resisting, but in some parts a slightly elastic feel; is closely attached to the parts beneath; and its surface is traversed by the external jugular, and by several other venous branches of considerable size. When examined from the mouth, it appears to be firmly fixed to the lower jaw, below the alveolar processes; but it can only be felt indistinctly, by pressing with the finger under the tongue. It measures in circumference, at its base, twelve inches, and at its apex seven

inches. Its diameter from above, downwards, and from before, backwards, is five inches; and it projects two inches beyond the jaw-bone, and about three inches beyond the edge of the mastoid muscle.

The tumour, when first observed, nine months ago, was about the size of a small nut: it was seated between the sterno-mastoid and the angle of the jaw, and was hard, moveable, and free of pain. It increased rapidly,—became the seat of obtuse pain; and she says, that during the last fourteen days that portion of it which stretches to the angle of the mouth has formed. It impedes deglutition and mastication, and she thinks has affected her health."

The external appearance of this tumour had a strong resemblance to that form of the disease usually called "tuberculated sarcoma," and the rapidity of its growth seemed to indicate the existence of a malignant tendency. It was impossible to form any accurate estimate of its deep-seated connexions; but I had reason to believe, that although it covered, it did not involve in its attachments, the important nerves or blood-vessels. So far as could be ascertained by external examination, it did not appear to dip very deeply behind the angle or ascending plate of the lower jaw-bone: it was evidently adhering firmly and intimately to the masseter and buccinator muscles; and, as it rose on the side of the face considerably above the lobe of the ear, there was reason to suppose that the parotid duct was either pushed up from its natural situation, or imbedded in the substance of the tumour: but none of these circumstances were such as to forbid an operation.

On the 10th of February, the tumour was extirpated, but with greater difficulty than I had expected. It adhered very intimately to the common integuments, and the fascia covering it was much thickened. I began to detach it at the posterior part, where it passed deeply under the angle of the jaw towards the base of the cranium, and proceeded forwards, dissecting it from the side of the face from the inferior maxilla and from the neck over the larynx and trachea. It adhered firmly to the lower jaw for about two-and-a-half inches; and here the bone was denuded of periosteum, rough, and

had a cribriform appearance. Two of the submaxillary glands, which were enlarged, were also removed; and the several parts with which the tumour was connected were distinctly seen. It had extended back as far as the styloid process of the temporal bone; and besides the sterno-mastoid, digastric masseter and buccinator muscles, which were more or less exposed, the sheath of the vessels was laid bare, through which the pulsations of the carotid were visible. Five arteries were tied; and as there was little chance of procuring adhesion, the hollow under the angle of the jaw was filled with lint. Two stitches were inserted, and the parts supported by straps, compress, and bandage. The hemorrhage which occurred was chiefly venous, and took place from the superficial veins, and from a large vein attached to the anterior part of the tumour. The external jugular escaped being injured.

On examining the tumour after its removal, it presented a soft greyish coloured texture, not unlike carcinoma, but without the fibrous bands or stony hardness peculiar to this morbid growth. In the centre there was a cyst about the size of a walnut, which contained a soft greyish coloured matter, about the consistence of cream. This was mixed with clots of blood: and there were three similar cysts in other parts of the tumour, corresponding to the nodules observed externally previous to the operation.

On the following day (the 11th), the pulse was rapid and intermittent. She swallowed with difficulty, and was so annoyed with dyspnœa, that she was obliged to maintain a semi-erect position. These symptoms did not appear to depend on the pressure of the dressings or bandage, but on irritation at the bottom of the wound. This was probably aggravated by the wound having been stuffed with lint,—a practice which I now think is sometimes injurious. She was ordered to inhale the vapour of vinegar and water, to avoid mastication, and to have an anodyne at bedtime.

These symptoms did not abate till the 15th, when the sutures and dressings were removed. The wound was suppurating, and the granulations florid. As there was a good deal of exhaustion, she was ordered wine and quina. On the 2d of March, the wound was nearly closed; and the carious por-

tion of the inferior maxilla, which for ten days after the operation remained exposed, and became dark coloured, was afterwards covered by florid granulations. In a few days longer she was dismissed, cured.

A section of the tumour which was removed from this patient did not coincide either with the description of tuberculated sarcoma given by Mr. Abernethy or with the specimens of the disease which I had previously met with. There was no appearance of its being composed "of an aggregation of small, firm, roundish tumours, of different sizes and colours, connected together by a kind of cellular substance."* Externally it had the irregular tuberculated surface which this species of tumour frequently exhibits: but this was produced by the projection of cysts, which were mixed up with the substance of the tumour. These cysts were filled with a soft, greyish coloured matter, not unlike softened and disorganized portions of brain; and the texture of the remaining part of the tumour was easily broken down with the finger. It had certainly a more close and striking resemblance to medullary sarcoma than to any other tumour with which I am acquainted.

The indolent tumours which form in the neck, and especially about the angle of the jaw, and for the removal of which the knife is so frequently required, so far as I have observed, belong, in general, to either the "pancreatic" or to the "tuberculated" species of the disease. When they are of small size, they not unfrequently resemble an enlarged salivary gland, and have a distinctly granular texture: but this appearance is only to be discovered at an early stage. Then they frequently resemble in structure and appearance the parts in which they are situated, and from which their supply of blood is derived. But it often happens, during their progress, that a new and independent action is established, by which important changes from the original structure are produced. These secondary changes are sometimes so numerous and complicated in the same tumours, as not only to destroy every trace of their primary organization, but also to render it extremely difficult to classify them according to their anatomical char-

* Abernethy's Surgical Observations, vol. I., p. 47.—London, 1804.

acters. Local applications will rarely prove beneficial in removing them, or even in retarding their progress. The external use of some of the preparations of iodine appears to me to be successful only when there is simple enlargement or hypertrophy of a part, but not where a new structure has been formed.

CASE XVI.—*Tumour in left side of Neck—Tuberculated Sarcoma—Extirpation followed by Erysipelas—Cure.*—Mr. M'G., æt. forty-five, admitted 27th September, 1831. There was situated behind the left angle of the jaw, a firm, irregular, and partially circumscribed tumour, about the size of a hen's egg, which was somewhat flattened, and admitted of very limited motion. It extended from the mastoid process over the ramus of the jaw, and appeared to pass deeply behind the angle of that bone. It pressed up the lobe of the ear, and extended along the cheek, fully half-an-inch beyond the usual situation of the parotid duct. This tumour, when observed for the first time, three years before, was about the size of a walnut; but it was only within the last four months that it began to increase perceptibly, and to be accompanied with pain.

On slightly depressing the head towards the left shoulder, and grasping the tumour firmly, it admitted of such a degree of motion, even in the limited and confined space in which it was situated, as led me to believe that it was capable of being extirpated. Accordingly, on the 30th, I succeeded in removing it, after a cautious dissection. Its posterior attachments were so firm and intimate, that they had to be divided with the knife, which was done close to the tumour. It was found covered by, and intimately adhering to, the inferior lobe of the parotid gland, which was also removed. The parotid duct did not present itself to view, but every precaution was taken to avoid it. Only two arteries required the ligature; and one of these was the occipital, about an inch of which was intimately adhering to, and removed along with the tumour. The edges of the wound were retained in apposition by three points of suture, over which a thick compress and double-headed roller were applied.

For several days after the operation she remained free of

fever, and complained only of difficult and painful deglutition, which was relieved by relaxing the bandage. On the 10th of October it was observed, soon after a smart rigor, that the skin around the wound was of a dusky red colour. This was speedily followed by well-marked erysipelas, which extended rapidly to the neck, face and scalp, and was accompanied by a good deal of constitutional excitement. By the use of cold applications and antiphlogistic treatment, this secondary disease was gradually removed. The wound healed completely, without any appearance of a salivary fistula forming, and she was dismissed, cured, on the 20th.

The tumour was found on examination to be of an irregular shape, to have a tuberose surface, and to be surrounded by a dense fibrous covering. A section of it displayed an assemblage of small yellowish-coloured tubercles, about the size of mustard seeds, apparently united by cellular texture. There were a few white fibrous bands in the centre; and near the circumference, where the tumour was attached to the parotid, there was a small portion, about the size of a sixpence, where the texture was more distinctly granular, and resembled that of one of the salivary glands.

It is often extremely difficult to classify such tumours, even after their structure has been freely displayed by the knife.—I am inclined, however, in the above case, to consider the disease as more nearly allied to the tuberculated* than to the pancreatic sarcoma; and, from the situation and connexions of the tumour, I am of opinion that the conglobate or lymphatic gland, situated under the inferior lobe of the parotid, was the part affected. As this gland enlarges it compresses, interrupts the function, and gradually occupies the position of the parotid,

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* Mr. Abernethy considers tuberculated sarcoma to be a very malignant disease; but I have had several opportunities of observing that this is not always the case. I have seen more than one instance in which such tumours have remained for years in a perfectly quiescent state, without exciting either local pain or constitutional disturbance. I recollect, in particular, of examining, when in Strathaven, in the summer of 1827, a young, healthy, athletic man, who had had a tumour of this kind on the left side of the neck, fully the size of a child's head, which had continued for years, and incommoded him only by its bulk. He refused to submit to its extirpation; and I was informed lately, by a medical student from that place, that he continues in good health, and that the tumour appears to be stationary.

from which it sometimes cannot be separated without removing a portion of this important salivary gland, and risking the formation of a fistula. The troublesome effects of this injury may be obviated, as in the last case, by the use of firm and continued pressure.

Although the two following cases are not included in the arrangement of tumours which has been adopted, the one being situated on the left shoulder, and the other close to the spine, yet I have been induced to report them, because the operation in the one proved fatal, and from its effects on the other the patient with difficulty recovered.

Case XVII.—*Tumour on left Shoulder—Medullary Sarcoma—Extirpation followed by Erysipelas and death.*—W. S., æt. fifty-nine, was admitted on the 25th of May, 1826. There was situated on the upper and outer part of the left shoulder, a tumour of an oblong shape, nearly the size of two fists. The integuments adhered to its surface, which was nodulated; and it was but partially moveable over the subjacent parts. It had an elastic feel, and was the seat of occasional burning and stinging pains. Six months before it was observed, for the first time; but several weeks elapsed before it increased much or became the source of uneasiness.

At a consultation on this case, doubts regarding the nature of the tumour were entertained. It was smooth, elastic, and fluctuated distinctly in the centre, which was the most prominent part. As a means of diagnosis, this part was punctured with an abscess lancet, and there only issued a few drops of bloody serum; which discharge continued until the tumour was extirpated two days after. There was reason to fear, from its elasticity and rapid growth, and from the stinging pain which accompanied it, that it was malignant.

On the 28th, it was extirpated, and found intimately adhering to the integuments, and also to the muscles, over which it was placed. It was necessary to remove a portion of the axillary margin of the latissimus dorsi, of the posterior edge of the deltoid, and of the infra spinatus muscles, along with the tumour. The integuments were retained in contact by straps

and a bandage; although from their thin and detached state, adhesion could hardly be expected to take place.

When the tumour was examined, it was found irregular on its outer and somewhat lobulated on its under surface. It was surrounded by a firm fibrous cyst; and, when cut into two, dissimilar textures were discovered. A small portion near its inferior margin had a fibro-cartilaginous feel and appearance, and adhered to the neighbouring parts very intimately; while the great bulk of the swelling was composed of a soft greyish coloured mass, divided into cells by fibrous septa, and possessing a strong resemblance to the brain in colour and texture. It also contained a few spots of coagulated blood; and around these the medullary-looking substance was much softer than in any other part, being nearly of the consistence of cream.

It was observed, at the first dressing, that erysipelas had attacked the wound, which was sloughy. The inflammation, which was of a dull red colour, and appeared to be confined to the skin, spread gradually over the shoulders, neck, back, thorax, and abdomen, until the whole trunk was involved. When it had nearly ceased in these situations, it extended over both arms to the wrists, and produced considerable swelling and hardness around the elbows. The febrile symptoms were rather urgent; the pulse was quick and full; —the tongue, which at the first, was thickly covered by a yellowish fur, soon assumed the typhoid appearance; the wound became pale and glassy; the countenance sunk and haggard; and although the erysipelas had completely disappeared, he became gradually more and more exhausted, and died on the 21st of June.

On dissection, the vessels of the brain and its membranes were turgid, and there was considerable serous effusion into the ventricles and under the arachnoid. Both lungs contained a number of greyish coloured firm tubercles, varying in size from a filbert to a mustard-seed. There was also discovered in the abdomen, attached to the mesentery, close to the middle of the duodenum, a tumour about the size of a small lime, which resembled distinctly, in external appearance and structure, the one removed from the shoulder.

I am inclined to consider that the tumour which was extirpated was a well marked example of medullary sarcoma, although it exhibited two kinds of morbid structure dissimilar to each other. This, I conceive, is by no means uncommon; at least I have frequently examined tumours which, from the rapidity of their progress, and their fatal termination, were evidently malignant, and composed of parts differing from each other in texture and appearance. This combination of heterogeneous textures, in the same morbid growth, is sometimes so great as to render it impossible for the pathologist to ascertain the specific characters of the tumour, or the class to which it belongs. The fact also that the disease in the last case had a constitutional origin, is proven by the occurrence of the same kind of morbid growth within the abdomen; from which it is evident, that even had the operation been successful in its immediate results, the abdominal disease would have advanced, and ultimately proved fatal. I have met with other two cases in which this encephaloid disease began in the extremities, and produced death by its appearance in the abdomen, where it formed large tumours, perceptible through the parietes of this cavity.

In Case XVII., the occurrence of erysipelas, its extensive diffusion, and the advanced age and impaired constitution of the patient, led ultimately to a fatal termination. For obvious reasons, the antiphlogistic treatment was but sparingly adopted, and that only at the commencement,—quina, wine, opium, and full diet having been had recourse to.

Case XVIII.—*Adipose Sarcoma over Lumbar Spine—Extirpation followed by Typhus Fever—Cure.*—Mrs. C., æt. thirty, admitted 3d May, 1831. There was situated on the left side of the upper lumbar vertebræ, and extending to the false ribs, a broad, slightly prominent tumour, considerably larger than the fist. It was ill-defined, but moveable; had a soft flucuating feel; was the seat of constant throbbing pain; and the integuments covering it had a healthy appearance. She complained of pain, on pressing the spine near the tumour; but no irregularity, or other disease of the vertebral column, could be detected. Was a patient in the medical wards for three

months previously, on account of hepatic disease; and she described the tumour as having been about the size of a hen's egg three weeks before, when she discovered it for the first time.

It was difficult to say, even after careful and minute examination, to what class of tumours this one belonged. It had more the feel and appearance of an encysted than of a solid tumour; and was at first supposed either to be a chronic abscess, or to be filled with an albumenous fluid: yet, when grasped firmly, the accuracy of this diagnosis was somewhat obscured, by discovering in its centre two or three hard nodules, not unlike those condensed portions so frequently felt in adipose sarcoma.

About the middle of May, after having employed a variety of local remedies, I made an exploratory puncture into the centre of the tumour, and discovered it to be of a solid texture. This practice is commendable when there exists any doubt as to the nature of the swelling. It is certainly better to make a cautious puncture when there exists an obscure sense of fluctuation, than to proceed rashly to extirpation. I have seen several cases in which the patient might have been saved much pain, and the surgeon a disagreeable and awkward exposé, by the adoption of this simple procedure; but I must confess, on the other hand, that I have seen it once prove fatal. This unfortunate occurrence was produced by a surgeon having punctured a large elastic tumour, situated in the middle of the thigh of a female, over the course of the femoral artery. The history of the case was obscure, and the tumour had none of the characters of an aneurism, being incompressible, and destitute of pulsation. Only a few drops of blood escaped, when the wound was closed, and a compress and bandage applied. In a day or two afterwards, a sudden hemorrhage took place, and proved fatal in a few minutes, before surgical assistance could be procured. On dissection, the tumour was ascertained to be an aneurism of the femoral artery,—its walls being greatly thickened, and lined with firm layers of fibrine.

As the puncture in the above case was productive of considerable pain and febrile excitement, I delayed the extirpation of the tumour till the 30th of May, when these had abated. It

adhered intimately to the integuments, and but loosely to the subjacent parts. It was composed of adipose substance, which was enveloped in a fine cyst, and was smooth and flat on its upper and under surfaces, but lobulated at the edges.

Immediately after the operation, this woman had a severe attack of irritative fever, which speedily assumed a distinctly typhoid type. At first there was intense heat of skin, thirst, flushing of the face, suffusion of the eyes and headach; with a pulse which ranged from a hundred and twenty to a hundred and thirty in the minute. These symptoms were combated by shaving, leeching, and applying cold to the head, purgatives, and diaphoretics.

On the 4th of June, considerable prostration of strength took place. The pulse became feeble, the countenance sunk and vacant, the skin cold, the teeth and tongue were covered with sordes, and there was low muttering delirium. Wine, spirits, and a solution of the carbonas ammoniæ were given freely. After she had remained ten days in this critical state, convalescence was established, and she left the house, cured, on the 23d of July.

II.—TUMOURS OF THE MAMMA.

In the following section, those cases of malignant disease of the female breast which have been lately under treatment will be shortly detailed. These serious and too often fatal affections are not now infrequent in their occurrence, and are to be observed in the various stages of progression, from a small defined and circumscribed tubercle to a large and solid swelling, in which the whole mammary gland is involved. In the former state, an operation may be undertaken with a prospect of success; but it will be found more rarely successful, when, as more frequently happens, the whole breast is included in the disease. When both mammæ are affected, as in the following case, and when diseased glands in the axillæ and above the clavicles also exist, with innumerable subcutaneous tubercles of a scirrhous hardness in the integuments of the thorax and abdomen, it would be highly improper to have recourse to an operation.

Case XIX.—*Carcinomatous Sarcoma of both Mammæ—Diseased Axillary and Supra-Clavicular Glands, with numerous subcutaneous Tubercles.*—Mrs. L., æt. forty-six, and the mother of several children, was admitted on the 1st May, 1826. Both breasts were enlarged, slightly irregular, of a stony hardness, and especially the left one adhered intimately to the parts beneath and to the skin, which was in some parts slightly discoloured, thickened and tuberculated. The left nipple was retracted, and surrounded by a hard scabby areola; and, in addition to a diseased enlargement of the axillary and cervical glands, the integuments of both breasts, as well as those on the front of the thorax and abdomen, as low as the umbilicus, were thickly studded with small, hard, discoloured, and painful tumours, which appeared to be situated in the subcutaneous cellular texture. The disease commenced about a year before, in the glandular substance of both mammæ, at nearly the same time; and after six months duration, the subcutaneous tubercles began to form. She left the Infirmary in the beginning of June, after having tried a variety of local applications without any benefit. Previous to her death, which occurred in about six months, ulceration of the left mamma, and of a number of the tubercles, took place, and ultimately thoracic disease supervened.

I have only seen other two cases in which there existed the same tendency to the formation of scirrhous tubercles in the subcutaneous texture,—a combination with carcinoma of the mamma which is not frequently met with. The first patient was an emaciated, unhealthy old man, who, after having had, for several months, a distinct carcinomatous tumour in the left breast, was affected with painful tumours under the skin in different parts of his body, several of which proceeded to ulceration. In the other, about four months after a scirrhous mamma was extirpated, the edges of the cicatrix became indurated, painful and livid; but, before it gave way, subcutaneous tubercles formed, and the disease proved speedily fatal.

The origin of these tubercles, which have all the characters of scirrhus, is to be ascribed to constitutional and not to local causes, as is evident from the fact that they may form during the progress of a carcinomatous mamma in the exter-

nal surface and in the internal cavities of the body, to which parts it is impossible that the diseased action could have been communicated through the medium of the absorbents. Their existence must be, therefore, considered as contra-indicating the use of the knife, even should the disease of the breast be otherwise favourable.

Case XX.—*Carcinoma of the left Mamma and Diseased Axillary Glands—Extirpation followed by Dysentery—Death.*—H. M., æt. fifty-one, married, but has had no children, Aug. 3d, 1831. There was situated, above the nipple of the left breast, a hard irregular tumour, about the size of a hen's egg, which, when observed nine months before, was not much larger than a pea. It was of a stony hardness, involved the greater part of the mammary gland, and was freely moveable beneath the integuments, which were of a natural appearance, but it had never been productive of the slightest pain. There also existed three enlarged glands high up in the axilla. Had suffered for many years from dyspeptic ailments, which were particularly severe during the previous three years. Pulse natural, —tongue furred at base,—bowels loose.

After attempting to improve the state of the digestive organs, I proceeded, at her anxious request, to extirpate the mamma and diseased glands on the 7th of August. But little blood was lost, and only two arteries required to be tied. The breast and largest of the glands exhibited the carcinomatous structure very distinctly.

On the 11th, the dressings were removed; the edges of the wound had united; and there was only a trifling discharge from the axilla. On the morning of the 16th she had an attack of diarrhœa, accompanied by severe abdominal pain, apparently spasmodic, which was partially relieved by repeated doses of calomel and opium, hot turpentine to the abdomen, &c. Notwithstanding the most active treatment, the disease increased on the 17th and 18th, and became decidedly dysenteric; the stools were frequent, scanty, and contained mucus; there was urgent tenesmus, with a constant pain in the rectum. The tongue was florid and apthous; the pulse small, weak, and rapid; the abdomen tumid, tympanitic, and slight-

ly painful on pressure; and the countenance sunk and anxious. She was ordered one grain of opium every third hour; an anodyne enema night and morning; a blister to the abdomen; occasional doses of pulvis Doveri, to determine to the skin, which was hot and dry; and her food consisted of arrow root, rice gruel, and isinglass jelly. She died on the evening of the 19th.

It was with difficulty that permission was obtained to inspect the abdomen. The intestines were greatly distended with flatus, and contained a small quantity of feculent fluid, of a bilious appearance. The mucous coat of the colon and rectum was deeply injected with florid blood, and there were elevated and ecchymosed patches in different places where its texture appeared softened and pulpy, but not ulcerated. There was also a small scirrhous tubercle in the substance of the uterus.

From the external condition of this mammary tumour, and from its structure on dissection, it was evidently carcinomatous; and the fact of a tubercle existing at the same time in the body of the uterus, and possessing the same morbid appearances, showed the disease to be constitutional. There was, however, a symptom a-wanting which almost uniformly accompanies this disease, viz. pain. I have only seen another case in which the breast advanced to ulceration, and the disease proved fatal without creating the slightest uneasiness; but there existed in this case severe pains in the arms, legs, and back, which I have frequently observed during the progress of this malignant affection, both when seated in the external parts and in some internal organ. When present, I am inclined to consider them as certainly indicating the existence of a constitutionnl tendency to the disease; and I have uniformly observed, that should an operation be had recourse to under such a combination, the disease will, at no distant period, show itself in a different part of the body. It constitutes what Sir A. Cooper has not inaptly called cancerous rheumatism.*

* Boyer states that he has often seen cancerous tumours of the mamma, of different, sizes destroy life, without exciting the slightest pain.—Traitè des Malad. Chir.—Tome vii., p. 227.

Case XXI.—*Carcinoma of the left Mamma—Enlargement of the Axillary Glands—Extirpation—Cure.*—Mrs. W., forty-six years of age, and the mother of several children, was admitted on the 14th of August, 1831. She observed, four years and a half before, in the outer part of the left mamma, a hard tumour, about the size of a field bean, which gradually spread to and involved the whole mammary gland. It was of a stony hardness, had a globular shape, an irregular surface, and was the seat of occasional darting pains. It was freely moveable over the subjacent parts, and only attached to the skin at a small point to the left of the nipple, where the integuments were of a purple colour. There was also a large, diseased, and painful gland, deeply seated in the upper part of the axilla. General health good. Catamenia had ceased three years ago.

On the 18th, the mamma and three axillary glands were extirpated. Four arteries were tied, and the bleeding from several smaller vessels arrested by torsion.

When the mamma was divided, it was found traversed in every direction by firm fibrous bands,—the interstices being filled with a soft, yellowish-coloured, cheesy substance, which exuded on pressure, and was mixed with a thin reddish fluid. Immediately under the discoloured spot of the integuments, one or two small bloody cysts were found. The largest of the axillary glands had several bloody points in its centre, besides the other appearances of carcinoma.

This patient had not a single unfavourable symptom after the operation. The wound healed nearly by the first intention; all the ligatures separated on the 27th; and she was dismissed, cured, on the 10th of September.

From the duration of the disease, and the size and depth of the axillary gland, it was but too evident that it had advanced to that stage when the success of an operation becomes extremely problematical. The softening of the inter-fibrous substance, which formed the great bulk of the morbid mass, showed that the tumour was breaking up, and that ulceration would soon have taken place. When there exists, in addition to the usual appearances of carcinoma, one or more cysts, filled with bloody fluid, I am led to believe that the disease is more

actively malignant, and that it is seldom, if ever, eradicated by an operation.

In the two following cases, the disease was still more extensive, and unfavourable for operation :—

Case XXII.—*Carcinoma of the Right Mamma—Enlarged Axillary Glands—Extirpation—Cure.*—Mrs. H., æt. forty-eight, admitted 6th September, 1831. There was seated in the right breast a hard, irregular and painful tumour, about the size of half-an-orange, apparently involving the whole mammary gland, and but loosely attached to the integuments and parts beneath: two enlarged and indurated glands were also felt in the upper part of the axilla. When the disease was first observed, five months previously, it was about the size of a small plum; and soon after this period she became subject to chills, flushings, pains in the limbs and back, defective appetite, and impaired health. The catamenia flowed regularly: she had had no family.

With the concurrence of a consultation, the mamma and three diseased glands, two of which were rather deeply seated under the edge of the pectoral muscle, were extirpated on the 9th. She bore the operation well, lost but little blood, and only three vessels required a ligature. Nearly the whole wound adhered by the first intention; the constitutional symptoms were moderate; and she was dismissed, cured, on the 7th of January.

About two-thirds of the glandular structure of the breast were included in the disease, which was distinctly carcinomatous; and in the centre of the tumour, softened portions of a dirty brown colour could be squeezed out, leaving the fibrous bands entire. The largest of the diseased glands was hard and irregular, and had undergone nearly the same change as the mamma.

Case XXIII.—*Carcinoma of the left Mamma—Disease of the Axillary and Infra-Clavicular Glands—Extirpation—Cure.* Mrs. F., forty-six years of age, and the mother of several children, was admitted on December 18th, 1831. Thirteen months previous to this period, after a smart febrile attack,

she observed a small tumour in the upper part of the affected breast; which continued to increase in size, and to produce severe and almost continued pain, of a lancinating kind. The tumour was large, nodulated, extremely hard, and freely moveable on the parts beneath, but firmly attached at one point to the skin, which was of a blue colour. The nipple was retracted. Several enlarged and painful glands were felt in the axilla; and there was a prominent but ill-defined tumour, about the size of a walnut, situated a little below the middle of the left clavicle, which was also painful to the touch. She had suffered much from mental anxiety; her health was considerably impaired; pulse quick and small; bowels constipated; complained of chilliness and headaches. Catamenia regular.

The disease was too extensive to be thoroughly extirpated: but as this poor woman had come from a great distance in the Highlands, and was exceedingly anxious to have the operation performed, even after she was candidly told that there was every probability of its proving unsuccessful, her urgent entreaties were complied with. On the 21st, after a troublesome and rather protracted dissection, I succeeded in removing the mamma and four clusters of large lymphatic glands,—being all the diseased parts within reach of the finger. These glands adhered intimately to the axillary fascia, and surrounding parts, but especially to the cellular texture, covering the plexus of nerves, from which they were with difficulty detached with the finger. In tracing them deeply under the pectoral muscle, I succeeded in laying hold of and extracting the enlarged gland, which lay under the edge of the clavicle.

Three arteries were tied, and but little blood lost; yet she lay for some time on the table in a state of syncope, from which she slowly recovered by the use of stimuli. Several days elapsed before reaction was fairly established. Her skin was rather cold,—the pulse rapid and feeble. She complained of great oppression; and was unable to articulate, except in whispers. After these symptoms ceased, her strength was gradually restored: the wound healed rapidly; the tumour under the clavicle disappeared; and she was dismissed, cured, on the 25th of January. I heard from this patient on the 15th of

May following; at which time there was no appearance of a return of the disease.

The collapse which took place was unusually severe and protracted; and was to be attributed to the violence of the shock to the nervous system, arising from a tedious and painful operation on an irritable and unhealthy subject. The disturbance of the nerves forming the axillary plexus, produced by tearing them from the diseased glands, must have proved injurious. This latter circumstance, in another case which I had an opportunity of witnessing, appeared to excite alarming symptoms of a similar kind, which continued long, and even threatened to prove fatal.

The carcinomatous structure of the mamma, as well as of the axillary glands, was distinctly marked,—the disease being in various states of progression. In some places it had the firmness of cartilage, and in others it was soft and friable. When this breaking up of the original tumour takes place, the neighbouring lymphatic glands become speedily involved in the same diseased changes. I have never known an instance in which an operation performed in such circumstances was ultimately successful,—the disease always returning, and that at no distant period. We will even find the same want of success in our operations for carcinoma of the mamma, although the diseased axillary glands bear no resemblance to the texture or appearance of the original tumour. Sometimes these glands are only sympathetically affected; and, without participating in the morbid process going on in the breast, they may altogether disappear. I have seen this happen to enlarged glands, above the clavicle, which appeared to be connected with a scirrhous mamma; but, as this result is comparatively rare, we ought not to rely on the spontaneous disappearance of such tumours, and allow them to remain when we proceed to the extirpation of the disease. I am afraid, therefore, that an operation will be altogether hopeless, when the axillary glands, as in the last three cases, have not only participated in the morbid action, but also in the structural changes of the adjoining disease. It is easy to exhibit, from the records of public hospitals, a lengthened list of successful cures; the individuals having not only recovered from the immediate

effects of the operation, but where, for some time after their dismissal, no vestige of the disease can be discovered. That a few of these cases may be cured permanently I am not inclined to deny; but were the whole watched, and accurately traced for a few years, it would be found, in nine cases out of ten, that a return of the disease would take place in the vicinity of the part from which it was extirpated.

When this malignant affection commences in the form of a tubercle, it is generally slow in its progress, and more favourable for extirpation than when the mammary gland is affected.

Case XXIV.—*Carcinomatous Tubercle of the left Breast—Extirpation—Cure.*—Mrs. S., fifty years of age, and the mother of three children, was admitted on the 29th August, 1831. About a year before, she observed a hard, painful, and circumscribed tumour, about the size of a walnut, attached to the outer edge of the breast, near the axilla. It did not increase, but the paroxysms of pain to which it gave rise gradually became more frequent and severe. There was no disease in the axilla. General health good. Catamenia ceased six years before.

This patient left the house, but returned on the 17th September; and on the following day (the 18th), the mamma was extirpated. The operation was followed by a smart febrile attack, and symptoms indicating biliary derangement. These were removed by the emeto-cathartic mixture, which produced free vomiting and catharsis. The wound healed speedily, and she was dismissed on the 11th of October.

On inspecting the breast, the tubercle, which was in a scirrhous state, was found firmly attached to the outer edge of the mamma. On making a section of the tumour, condensed fibrous bands could be distinctly traced into the glandular substance of the breast, to a considerable distance from the point of its external attachment.

I cannot agree with Sir A. Cooper, when he asserts that scirrhous disease of the mamma is most frequently met with in the form of tubercle. My experience, on the contrary, leads me to state, that for one case in which a distinct and well-defined tubercle exists, either in the glandular substance of the breast or connected with it, we shall meet with six or

eight cases in which the whole mamma is affected. When the former state exists, the absorbent glands are longer of becoming contaminated, and an operation will prove more successful in completely eradicating the disease. Should extirpation be had recourse to, it is the safest practice in all cases of carcinomatous tubercle to remove the whole breast; as, without this, there is a risk of its recurrence, owing to a number of these fibrous bands, so characteristic of this disease, penetrating deeply into the substance of the mamma.

The breast is sometimes the seat of another form of malignant disease, viz. medullary sarcoma. The following case is an example:—

Case XXV.—*Medullary Sarcoma of the left Mamma—Large Tumour in the Axilla—Extirpation—Ligature of the Axillary Vein—Cure.*—Mrs. B., æt. forty-nine, September 12th, 1831. The left mamma was enlarged to the size of the fist, and indurated at the base, but elastic and tuberose on the surface. It was freely moveable, and its upper half, which was the most prominent part, was covered by integuments of a purple colour, which were traversed by varicose veins. A tumour, possessing similar characters, and about the same size, occupied the left axilla, and was so firmly fixed as to admit of but limited motion. From this, acute pains darted along the arm, which, with the pain of the breast, prevented sleep. There was also considerable thickening of the soft parts under the middle of the left clavicle, producing a slight projection perceptible to the eye, but no defined tumour could be felt.—General health good.

When the disease was first observed, about two years before, at which time the catamenia had ceased, it was the size of a filbert; but did not increase much till six months ago, when the tumour began to form in the axilla.

On the 20th, the diseased parts were extirpated. The removal of the mamma was speedily accomplished; but considerable difficulty was experienced in detaching from the axilla the diseased mass, which was fully larger than the breast. It adhered intimately to the margins of the pectoralis major and latissimus dorsi muscles, to the fascia, to the plexus

of nerves, and, for nearly two inches, to the axillary vein. Notwithstanding the utmost caution in separating the tumour, which, from the firmness and intimacy of the adhesions, had to be done with the knife, the axillary vein was unavoidably wounded, and profuse hemorrhage produced. I was averse to include the wounded vein in a ligature, or to thrust a large sponge into the wound, and retain it there till free suppuration was established. In adopting the former plan, there was a risk that the inflammation produced by the ligature might extend along the vein to the heart, and prove fatal; at the same time I considered the latter practice, from what I had seen in another case in which it was adopted, to be uncertain in its effects, and incapable of arresting the hemorrhage, unless the sponge were secured with a degree of tightness which would interfere with the circulation in the axilla, and be productive of both local and constitutional excitement. It appeared to me that the unfavourable symptoms, from the application of a ligature, might be avoided, by pinching up and tying the wounded part, without including the whole calibre of the vein. This was accordingly done, by transfixing with a tenaculum both sides of the wound in the vein, drawing it out, and passing a ligature around it.

The tumour was then separated from its remaining attachments, and completely removed. She was in a state of syncope, and vomited repeatedly while on the table; but the stomach was quieted, and reaction excited by a draught, with laudanum and brandy.

For three days the febrile excitement ran high; the pulse was one hundred and thirty in the minute; the skin hot; the tongue loaded; and she complained of great restlessness, and of acute pain in the upper and outer part of the left shoulder. These symptoms were, however, removed by purgatives, diaphoretics, and anodynes. The greater part of the wound adhered by the first intention; all the ligatures separated, except the one from the axillary vein; and she was dismissed, cured, on the 11th of October.

When the diseased mamma was divided, the structure and appearance of fungus hæmatodes were distinctly displayed. The tumour was soft and spongy, and composed of a number

of small cysts, containing a thin bloody fluid, between which the soft, greyish-coloured, brainy-looking substance was deposited. The section of the parts presented a bright red colour, from the escape of the sanguineous fluid from the different cysts; but when the cut surface was scraped with the edge of the scalpel, the encephaloid structure became apparent. The axillary tumour contained only one very minute bloody cyst, the rest being composed of the soft medullary substance, which was more distinctly marked than in the mamma.

In this case, besides the disease in the breast, there was a large tumour filling up the axilla, projecting to a considerable distance beyond its borders, and adhering intimately to the subjacent parts. This state of the axillary tumour, along with the suspicious swelling under the clavicle, made me averse to the knife, from a conviction, that while subjecting this patient, on the slenderest possible grounds of ultimate success, to the pain and risk of a serious operation, it would be hardly possible to prevent a recurrence of the disease. I have seen several cases in which the diseased parts were amputated at a much earlier stage, and where there was but little, and in some instances no affection of the axillary glands; but the result was uniformly unfortunate. It was only, therefore, after urgent entreaties on the part of the patient, that I consented to an operation; and on her dismissal from the Infirmary, I stated my conviction, in a clinical lecture on her case, that the disease would again speedily show itself.

On the 8th of December following, this woman died of serous apoplexy in her own house. An inspection of the body was made by my intelligent and indefatigable Clerk, Mr. Alex. Ure. The cicatrix could hardly be distinguished from the sound skin. The parts in the axilla were condensed and matted together. The axillary vein was pervious, but its calibre was slightly diminished at the point to which the ligature had been applied. No vestige of the fungoid disease could be discovered.

Fungus hæmatodes and cancer generally commence in the mamma, and extend to the axilla: but in a few cases the reverse occurs; the morbid growth forms in the axilla, and the breast

escapes being affected, or is only secondarily involved. The following case is the second of this kind which I have lately met with:—

CASE XXVI.—*Medullary Sarcoma in the Axilla, and extending to the outer edge of the Mamma—Extirpation apparently successful.*—M. S., æt. thirty-nine, married, admitted February 3d, 1832. The right axilla was filled with a hard, irregular, and flattened tumour, of an oblong shape, which was the seat of violent paroxysms of lancinating pain. The fingers could not be insinuated between its upper margin and the axillary vessels: it dipped under the edge of the pectoralis major and latissimus dorsi muscles, and admitted of but limited motion. A thickened band was traced from its inferior border to the mamma, a small portion of which felt hard and painful. She slept ill, and complained of pain, numbness, and inability to move the right arm. The tongue was smooth, and of a dark red colour,—appetite impaired,—bowels natural,—menstruation regular,—countenance sallow,—pulse seventy-two. The tumour in the axilla was first observed three years before, about twenty-one days after she was delivered of her second child. It was then the size of a field bean; but did not increase much, or become painful, till about five months ago.

The rapid growth of this tumour, when viewed in connexion with the other symptoms, led to the belief that the disease was malignant. It had a stronger resemblance to scirrhus than to fungus. It wanted the soft elastic feel and globular shape which the latter disease usually presents. The extent of the tumour, and its apparent attachment to the axillary vessels, were inimical to an operation. This was candidly stated to the patient, but did not alter her resolution in the slightest degree.

On the 12th of February, the tumour, mamma, and intervening band of thickened substance, were extirpated. The operation was rather tedious,—the separation of the disease from the upper part of the axilla being attended with considerable difficulty, on account of its adhesion to the vessels and nerves. One of the nerves was deeply imbedded in the substance of the tumour, and had to be divided. The he-

morrhage was rather profuse,—an unusual number of large arteries having been cut. She bore the operation with great fortitude, but became faint; and for ten minutes her pulse was imperceptible, and her countenance blanched. In a short time she began to recover, when she was carried to bed in a recumbent position. In half-an-hour vomiting occurred, which was soon followed by reaction.

This operation was not succeeded by the usual febrile excitement. The pulse never rose above ninety in the minute. An occasional purgative, and small doses of an antimonial diaphoretic, were the only remedies required. More than two-thirds of the wound adhered, but the parts in the axilla suppurated. She left the hospital on the 10th of March, in better health than she enjoyed on her admission. The tumour presented, on dissection, the structure and appearance of medullary sarcoma. It was composed of three cysts; one of which contained a bloody fluid, and the others a soft, yellowish-white, brainy-looking substance, in which were small clots of blood. The inner surface of these cysts had a dark-red villous appearance, and was studded here and there with small spongy granulations, the encephaloid substance in immediate contact with these points being in a state of greater mollescence than in any other part of the tumour. The outer edge of the mamma was hypertrophied and indurated; and in the cellular substance, immediately exterior to it, two enlarged lymphatic glands were found.

This case shows that we cannot always distinguish, by external examination, fungus hæmatodes from carcinoma. The obscurity is in a great measure confined to the early stage of the former disease. The tumour is then often hard, and feels like a part enlarged by chronic inflammation; but, as it advances, it becomes softer and more elastic; and the nearer it approaches the surface, the more distinctly will the characteristic symptoms and appearances of the disease be developed.

III.—TUMOURS OF THE ABDOMEN.

The viscera of the abdomen, however dissimilar they may be in structure and function, are all, more or less, liable to

become the seat of morbid tumours. These are, generally, cognizable through the soft and yielding integuments forming the walls of the cavity in which they are contained; nevertheless, it is always difficult, and often impracticable, to ascertain their exact seat and attachments. It is well known, that, in a state of health, certain viscera are contained in certain regions of the abdomen; but, when we consider that many of these are but loosely attached, and may, both in health and disease, be considerably removed from their natural position, we perceive how cautious we ought to be in affirming, because a tumour exists in a certain region, that it is always or necessarily connected with the viscus, which that region naturally contains. When the external characters of such tumours are obscure and inconclusive, we are told that the function of the affected organ will be always so much deranged as to enable us to establish a satisfactory diagnosis. This is by no means the case,—tumours having been often met with in the epigastric and umbilical regions, unaccompanied by any clear or satisfactory symptoms, but which were found, on dissection, to depend on organic disease of the stomach. Were we, therefore, to recognize a large globular tumour below the umbilicus, we might be apt to conclude, that from whatever part it originated, its low position, and the absence of symptoms indicating an affection of the stomach, distinctly showed that this viscus was not involved. But again,—we know that the stomach often descends considerably into the abdomen; and that, on this account, tumours attached to it have, from their depending position, been mistaken, not unfrequently, by experienced practitioners, for other diseases,—a case of which is mentioned by Dr. Monro. There are also several interesting cases of large tumours of the stomach, occupying different regions of the abdomen, detailed by Dr. Seymour, in the fourteenth volume of the Medical and Chirurgical Transactions of London. In some of these, the absence of well-marked symptoms, and the unusual size and situation of the tumours, did not lead to a suspicion that the stomach was implicated, until this was ascertained by dissection. The pyloric orifice was the part affected, and the tumours presented the malignant characters of the encephaloid disease.

The difficulty is still farther increased, because, in all the artificial divisions of the abdomen, there is situated not a single organ, but a variety of parts,—in any one of which the tumour may be situated. If it exists in the centre of the abdomen, it may arise from the peritoneum, the omentum, the intestines, the mesentery, the stomach, &c.; if in the hypogastrium, from sources not less numerous and obscure. There is not, in fact, a more difficult and uncertain part of medical practice, than to distinguish between the different tumours daily to be met with in the abdomen, or to obtain any thing like conclusive or satisfactory evidence as to their origin and connexions. It is this uncertainty in diagnosis, so generally felt and acknowledged, that renders the question regarding the propriety of surgical interference so interesting and important. I shall make no apology for detailing, at some length, several cases of abdominal tumours which came under my own observation, partly for the purpose of confirming what I have now advanced, and also to show, from a careful examination of their origin, history, termination, and *post mortem* conditions, how far the operation of gastrotomy, which has of late been frequently performed, is entitled to commendation.

I shall commence with the superficial and least obscure, and gradually proceed to the deeper seated and more complex tumours, in the following order:—

1st, Tumours confined to the Abdominal Parietes.
2d, Tumours depending on Disease of the Peritoneum, Omentum, or Mesentery.
3d, Tumours arising from Alvine Concretions; and,
4th, Ovarian Tumours.

1st.—TUMOURS CONFINED TO THE ABDOMINAL PARIETES are not of rare occurrence; and, when seated exterior to the muscles, are easily recognized.

CASE XXVII.—*Cystic Sarcoma of the Abdominal Parietes—Extirpation—Cure.*—H. M., æt. four, admitted 11th Oct., 1831. There was situated in the right inguinal region, and extending downwards in the direction of Paupart's ligament,

a prominent ovoid tumour, about four inches in diameter. It felt firm towards the margin, which was ill-defined, but was tuberose on the surface, and in several places so elastic as to resemble a collection of cysts containing fluid. It was freely moveable over the subjacent parts, but was firmly and intimately fixed to the integuments, which at one point had a bluish colour. When first observed, at birth, it was about the size of a field bean, but did not increase much till about nine months before he was brought to the Infirmary, after which it became the occasional seat of pain.

From external examination, this tumour was supposed to be partly solid and partly encysted,—a combination not unfrequent in its occurrence. It was evidently seated exterior to the abdominal muscles; and there could not, therefore, be any doubt as to the propriety of having it extirpated. This was done on the 16th; and the tumour found so firmly attached to the integuments and fascia, that its separation could not be effected, without wounding two or three small superficial cysts, and giving exit to dark-coloured serum. After a single vessel was secured by ligature, the edges of the wound were brought into contact by two sutures, over which straps and a bandage were applied.

This boy was feverish for a few days, and partial suppuration took place; but the wound ultimately healed, and he was dismissed on the 14th of November.

The tumour was found to consist of an assemblage of cysts, varying in size from a filbert to a pea. Several of the most superficial communicated with each other, and presented a honey-comb appearance; but, more deeply seated, each cyst was entire, and apparently separated from its neighbour by cellular tissue. They were covered externally by a fibrous, and lined internally by a smooth, serous membrane, and filled with a dark-coloured fluid.

This variety of tumour is met with more frequently in some parts of the body than in others; and in advanced life it occurs more frequently than in youth. It is unaccompanied by pain; and the integuments placed over it retain their natural colour until the fluid is close to the surface, when a slight blue tinge is observed. It is, in general, easily removeable by operation; and there is almost no risk of its reproduction

When there is only one cyst, and that one is small in size, the disease may be cured by evacuating the fluid, and producing inflammation and cohesion of the secreting surfaces; but, when the tumour is large, or is composed of several cysts, the complete removal of the diseased mass by the knife is always necessary. I have seen severe local inflammation and high constitutional excitement produced by puncturing such tumours, with a view to their cure by inflammation or suppuration; and I would deprecate this practice, as less certain in its effects, and more hazardous to the patient, than that of simple extirpation.

With the exception of the ovaries, there would seem to be a greater tendency to the formation of encysted tumours in the cellular texture than in any of the other tissues of the body. Were the cells of this texture to become obliterated by adhesion or otherwise, the natural serous secretion may probably be so gradually augmented as to form a distinctly encysted tumour; at least, I have seen more than once appearances which rendered this supposition by no means improbable. The same explanation may also hold good in many of those cases in which there exists a congeries of cysts distinct from or communicating with each other.

Chronic abscesses sometimes form between the layers of the abdominal muscles, or immediately exterior to the peritoneum. When these are large and ill-defined, it is hardly possible to determine, until the matter approaches the surface, whether the tumour is situated in the parietes, or arises from some of the deeper seated parts within the cavity of the abdomen. The same difficulty attends the diagnosis of those encysted tumours which occasionally form between the peritoneum and abdominal muscles, as occurred in a case which I had an opportunity of frequently examining some years ago.

Case XXVIII.—*Encysted Tumour of the Abdominal Parietes—Puncture, followed by Peritonitis and Death.*—A poor woman, about forty years of age, had the middle and inferior regions of the abdomen occupied by a smooth, firm, globular tumour, of great size. It had existed for two years before she applied to a surgeon; but she could not point out the situation

in which she first observed it, nor give any satisfactory account of its progress. An obscure feeling of fluctuation existed in the centre, which projected in a somewhat conical form; and the integuments were so tense, and the boundaries of the tumour so ill-defined, as to render it impossible to obtain a knowledge of its connexions. It was the frequent seat of acute pain; and, as it increased in size, it appeared, by its bulk and pressure, to impede the action of the bowels, and give rise to frequent attacks of colic.

Very dissimilar opinions as to the nature of this tumour were entertained by the various surgeons who examined it: all, however, agreed in thinking that it was within the cavity of the abdomen, and that it should be punctured. This was done with a trocar, and several pints of fluid, of the colour and consistence of mucilage, were evacuated. The wound was carefully closed, and a large compress and firm bandage applied.

Symptoms of peritonitis appeared a few hours after the operation, and, in spite of the most active treatment, proved fatal in five days. The intestines were found, on inspection, highly inflamed, and, in several places, glued together by lymph. No tumour existed within the abdomen or pelvis, but it was found that the fluid had been contained in a large cyst, formed by the peritoneum internally, and by the abdominal muscles externally. The peritoneum was much thickened, and the inner surface of the cyst highly inflamed. Had the tumour been punctured at an earlier period, it is probable that the fatal peritonitis would have been prevented. M. Lisfranc, in lately detailing to the Royal Academy of Medicine in Paris some cases of encysted tumours of the abdomen, recommends that they should be opened early, and injected with a stimulating fluid. This practice is not unattended with danger. I am acquainted with one case, besides others on record, in which fatal peritonitis was thus excited. If the encysted tumour, whether situated within the abdomen or exterior to it, is closely invested with the peritoneum, the inflammation, which it is the object of the stimulating injection to produce, is apt to extend to this membrane, and give rise to dangerous symptoms.

Abscesses often form in the iliac regions of the abdomen, enlarge slowly to a great size, and are sometimes mistaken for ovarian tumours. At times, the rapidity of their progress, and the acute local and constitutional symptoms by which they are accompanied, will clearly point out the nature of the disease. It is in chronic abscesses of the iliac fossa of the female that the diagnosis is so generally obscure.

Case XXIX.—*Chronic Abscess of the right Iliac Fossa, which burst externally, and was followed by an Artificial Anus and by death.*—Mrs. A., æt. thirty-eight, complained for several months of a dull pain in the right iliac region, before any swelling or constitutional derangement was perceptible. A tumour was by and bye discovered, which appeared deeply seated, was smooth and firm to the feel, and without fluctuation. It continued for six months without undergoing any perceptible change; but her strength began to decline, and the countenance to assume a sunk and haggard appearance. She had now frequent attacks of pain in the belly. The pulse was accelerated, the bowels were irregular, the stomach irritable, and, as the tumour advanced, the right leg became œdematous. Soon after the commencement of these symptoms, fluctuation was indistinctly recognized in one part of the tumour, which now filled the iliac fossa, extended considerably above the crest of the ilium, as also backwards to the spine, and projected about two inches beyond the level of the surrounding parts.

I was uncertain whether the tumour depended on encysted disease of the ovary, or on chronic abscess, but I determined to make a cautious puncture into the softest part of it. She refused to submit. In a short time, it began to point externally, the integuments inflamed and ulcerated, when an immense discharge of pus took place. Three days after, the abscess burst; fæces and flatus were freely discharged through the external opening; and, in eight days, the patient died. It was found, on dissection, that a large thick cyst occupied the right iliac and lumbar regions, and extended into the pelvis: it also surrounded the cœcum, in which there was an ulcerated opening capable of admitting a finger.

Women, in the puerperal state, are liable to the formation of abscesses immediately above the groin. These, when slow in their progress, and confined to the cellular texture of the iliac fossa, are difficult to be discovered; but, when they rise above Paupart's ligament, and separate the peritoneum from its connexion with the parietes of the abdomen, they are more easily recognized. We also meet with abscesses in the same situation from inflammation and suppuration of the ovarium.

Dupuytren recommends that all these deep-seated abscesses should be left to nature, and allowed to burst, as they generally do, into the bowels, vagina or bladder. I think, however, that as soon as the symptoms are well marked, much mischief may be prevented by puncturing them, and evacuating the matter,—a practice which I have frequently had recourse to with decided advantage.

The following case of sarcomatous tumour between the layers of the abdominal muscles, is in several respects interesting:—

Case XXX.—*Organized Sarcomatous Tumour between the layers of the Abdominal Muscles—Extirpation—Cure.*—W. T., æt. twenty-two, 25th September, 1831. There was situated in the right iliac region, nearer to the spinal column than the umbilicus, a smooth ovoid tumour, about the size of the fist, which had a hard cartilaginous feel, admitted of hardly any motion, and was apparently attached to the floating end of the twelfth rib. It projected nearly an inch beyond the level of the abdominal integuments, and was distant six-and-a-half inches from the umbilicus, four inches from the spinous processes of the vertebræ, and four from the anterior superior spinous process of the ilium. The fingers could be partially insinuated under its anterior margin, which was slightly irregular, and from which firm bands were felt passing in various directions.

When the tumour was first observed, two years ago, its origin being attributed to severe exertion, it was about the size of a field bean. It gradually increased, and became so painful as often to prevent sleep,—the pain being not only

situated in the tumour, but also extending across the abdomen, and along the right thigh.

At a consultation, on the 28th, the majority of my colleagues were of opinion, that on account of the difficulty of ascertaining the parts to which the tumour was fixed, and the risk of the abdomen being laid open, no operation should be had recourse to. For reasons which I shall afterwards state I dissented from this decision, and thought that an operation, although likely to be difficult in its performance, was perfectly safe and practicable. I had no faith in the use of external applications, but, as I wished to retain the patient in the Infirmary, I ordered the tumour to be rubbed night and morning with a combination of mercurial ointment with camphor, and to be repeatedly leeched. In a few days, the mouth was decidedly affected; and on the 6th of October, the mercurial frictions were discontinued. The only change which these applications produced, seemed to consist in a slightly increased mobility of the lower half of the tumour, the upper half over the rib remaining as firm and immoveable as formerly.

On the 15th of October, it was agreed, at a second consultation, that the tumour should be extirpated. To this opinion one of the gentlemen objected, by stating his conviction, that the tumour was covered by all the abdominal muscles, and was attached to, and incorporated with, one of the ribs. Had I been satisfied of the correctness of this opinion, I should certainly have declined the operation, unless the patient continued anxious for its performance, after its difficulties and dangers had been fairly stated to him, especially as the disease, although productive of considerable pain and inconvenience, had not in the slightest degree impaired his health; but, as my opinion was decidedly different, I did not hesitate to recommend it.

On the following day (the 16th), the tumour was extirpated with great ease. On making an elliptical incision, eight inches in length, and dissecting off the investing integuments, the tumour was still covered by a layer of muscular substance, which was found to be the external oblique. When this was divided, the tumour came into view, and was found resting on, but not attached to, the ribs. It was easily separated from its

posterior attachments by the finger, and made to start from its deep position by pressure. It was about the size of a lemon; had a greyish colour, not unlike half-bleached wax; was in some parts semi-transparent, and exhibited a smooth, compact texture,—its centre being fibrous. It was covered by a firm membrane; and was found, when analyzed, to be chiefly composed of albumen.

Three arteries were tied, and the edges of the wound retained in opposition by sutures, &c. For three or four days there was considerable febrile excitement, with pain in the wound, increased on motion and coughing, and with flatulent distention of the abdomen, but without pain or tenderness on pressure. For these symptoms purgatives were effectually employed. The wound healed rapidly; and he was dismissed on the 15th of November.

In this case there was no difficulty in ascertaining that the tumour was confined to the parietes of the abdomen. It was less easy, however, to say whether it was covered only by one or by all of the abdominal muscles. At first sight, the partial mobility of the tumour, and its apparent fixture to the inferior rib, where it seemed to pass more deeply, led to the belief that it was situated between the abdominal muscles and the peritoneum. On more minute examination, however, I was satisfied that it was only covered by a thin layer of muscle, and that what appeared to be fibrous bands, passing from its anterior margin, were only portions of the external oblique, raised and put on the stretch by the size of the tumour. At this part the fingers could be pushed under the edge of the tumour; and it could be moved a little, and slightly raised,—circumstances which could hardly have been expected in so robust and muscular a subject as this patient was, had all the abdominal muscles covered it. It is quite possible, however, to grasp and elevate a tumour, although covered by all the muscles forming the abdominal parietes, in individuals of relaxed fibre,—such as women advanced in years, or who have borne several children. The appearance which the tumour had of being more superficially seated anteriorly than posteriorly, was evidently deceptive, as it could hardly be supposed to be covered with more layers of muscle in one place than in another. On the

contrary, it was more reasonable to expect that it was entirely confined to, and continued to grow between, the muscular planes in which it was originally developed.

In the next case the tumour was also situated between the layers of the abdominal muscles, but its attachments were deeper and more extensive than in the one last detailed, and the operation for its removal was greatly more difficult. It ultimately proved fatal. As this case excited a good deal of interest, I shall give its history, and the subsequent reports regarding it at considerable length.

Case XXXI.—*Fibro-Cartilaginous Tumour, situated between the layers of the Abdominal Muscles—Extirpated along with a portion of the two Inferior Ribs—Operation followed by fatal Peritonitis.*—Mrs. R., æt. twenty-six, admitted on the 18th January, 1832. In the right iliac region of the abdomen there was situated a tumour about the size of the fist. Its posterior margin was distant from the spinous processes of the vertebræ two inches, and it passed obliquely downwards and forwards to near the anterior superior spine of the ilium. It appeared to be attached to the two inferior ribs, and for the space of two inches to the crest of the ilium. It had a hard cartilaginous feel, was of an oblong shape, and measured six inches in the greater and five in the lesser diameter. It projected from the side of the abdomen somewhat prominently, was covered by healthy integuments, admitted of limited motion, and at the lower edge the fingers could be passed under it. It occasioned severe pain, especially during the night, which extended to the thigh and prevented sleep. Its origin was attributed to a fall against the edge of a table three years ago. When first observed, it was as large as a pigeon's egg, and was situated over and apparently fixed to the ribs. Her health had varied considerably, and she had employed a variety of local and constitutional remedies without the slightest benefit.

This patient was in the hospital, under the care of Dr. Perry, nearly a year before, when I had an opportunity of seeing her for the first time. The tumour was then smaller in size, more moveable, and less painful. During last summer

and autumn, she consulted me repeatedly regarding it; and, as it enlarged, became firmer fixed, and occasioned more acute pain, her anxiety to have it removed became proportionally urgent. It was, in fact, evident, that were an operation at all advisable, the sooner it was performed the better, and that the chances of success would be increased by having recourse to it before the tumour had acquired firmer and more extensive attachments to the important parts near which it was situated. After several careful and deliberate examinations, I was convinced that it was placed between the layers of the abdominal muscles, and that it might be removed without laying open the cavity of the abdomen, or wounding the peritoneum. I stated this opinion to the patient, but refrained from urging her to submit to the operation. On the contrary, I informed her, that although it might be removed without injury to any important part, yet, from the vicinity of the tumour to the peritoneum, there was a risk that inflammation would supervene, an occurrence which was highly dangerous under any condition, and especially after a surgical operation. About the beginning of December she was again examined, at a consultation by all the surgeons of the infirmary, as well as by several other medical men, when nearly the same opinions were expressed, and I was authorised to extirpate the tumour should she still continue anxious for an operation, after the dangers and difficulties had been fairly and candidly stated to her. This was done, and I heard nothing more of her for several weeks. In the meantime she had consulted a number of the most respectable surgeons in town, and been still farther perplexed and alarmed by the opinion she had almost uniformly received,—that it was impossible to remove the tumour without opening the belly,—that the bowels would escape through the wound, and she would die in the hands of any one who would attempt so hazardous an operation. To satisfy herself still farther, she went to Edinburgh, and consulted two eminent surgeons of that city. They dissuaded her from an operation, and stated their conviction that the tu mour could not be extirpated without laying open the cavity of the peritoneum, and exposing her to great immediate danger; but, after observing her anxiety to get rid of the disease,

one of them offered to remove it. She returned to Glasgow, and again consulted a number of surgeons privately, one of whom wished to be the operator. On the 18th of January she was admitted into the Infirmary; and, at her earnest request, the tumour was extirpated on the following day.

She was laid on her left side, under which a folded pillow was placed. An incision was made over the centre of the tumour, commencing an inch from the spinal column, and extending obliquely downwards and forwards for about two inches beyond the anterior superior spine of the ilium. The integuments were dissected back, and the external oblique muscle exposed. In order to ascertain how many muscles covered the tumour, I cut freely down over its lower margin, and found it to be situated betwixt the internal oblique and transversalis. It adhered so intimately to both these muscles, that its separation from them was impracticable. I therefore divided the transversalis, with great caution, at the lower part of the wound. The finger was then passed between it and the peritoneum, and the internal oblique and transversalis divided close to the lower and outer edge of the tumour, which had to be separated also from the iliacus internus, and from the psoas muscle, under the edge of which it dipt. Its attachment to the floating ends of the two inferior ribs was so intimate as to render necessary the removal of these parts along with the tumour. The finger was passed under the ribs to separate the subjacent soft parts from them, which was done with ease: they were then divided close to the tumour with Liston's bone forceps. The operation was finished by detaching the anterior part of the tumour, and separating the peritoneum from its base. Three arteries were tied; the largest of which was the epigastric. Not more than six ounces of blood were lost. The cavity that remained could contain the fist. Its boundaries were distinctly seen, and the peritoneum found to be uninjured. Four sutures were introduced, and the wound dressed with straps and compress, over which a broad bandage was applied.

On examination, the tumour, which was of an oval shape, and somewhat flattened, had a smooth surface, but felt exceedingly hard. It was of a fibro-cartilaginous structure, and

was with difficulty divided with a scalpel. The extremities of the two ribs had penetrated fully an inch into its substance, and were firmly attached to it. It was evident that the tumour had not originated from the ribs, but had only become attached to them during its growth.

Immediately on being put to bed she complained of chilliness and pain in the wound, for which she had a draught, with thirty drops of the liquor opii. In an hour and a half she became faint, and continued so for several hours. Her face was blanched, her pulse feeble and indistinct, and altogether she had the appearance of a person exhausted by loss of blood.

Ten o'Clock P. M.—Complains of pain in wound; troublesome flatulence; urgent thirst. Has vomited repeatedly; feels chilly, but skin is warm; pulse a hundred,—more distinct. —*Reptr. haust. anodyn.*

20th, Half-past Three A. M.—Had a little sleep after midnight, from two grains of opium, but is now exceedingly distressed. Vomits incessantly; much anxiety and restlessness; thirst urgent; complains of acute pain in wound; pulse one hundred and twenty,—sharp. *Bled to syncope:* eighteen ounces were abstracted; blood neither cupped nor buffy.

Ten A. M.—Is weak and restless; belly tumid, but without tension or tenderness; pulse a hundred and twenty,—feeble; tongue dry, but clean; no stool.—*St. sum. Pil Rhei Co. ij et post hor. tres injic. enema terebinth.—Fotus abdom.*

Three P. M.—There is considerable tenderness on pressure in the right inguinal and iliac regions; great restlessness; laborious breathing; frequent vomiting; face and lips pale; countenance anxious; pulse a hundred and forty,—rather indistinct.—*Applic. hirudin* xviii. *abd. later. dext.*—R. *calomel gr.* xx. *sum. st.—Haust. efferves.—Let a large enema be administered with the patent syringe, and repeated every third hour.*

It was evident at this time that peritoneal inflammation had commenced; but the sunk appearance of the patient, and the feeble state of the pulse, which were probably occasioned by the shock of the operation, contra-indicated the use of the lancet. The object I had in view in the treatment was to diminish the inflammation by leeches, fomentations, &c.; to procure, as speedily as possible, free alvine evacuations; and then to excite mercurialism by the exhibition of calomel and opium.

Half-past Eight P. M.—Vomiting has ceased, and she has had some sleep; belly still as much distended, but there is less pain on pressure; respiration laborious, and forty in the minute; pulse hardly to be counted; one free evacuation from enema.—*Rept. Pil.—Enema comp. decoct. caps. colocynth.—et post alv. solut. incip. sum.—Pil calomel c. opio—Contr. fotus.*

21st, Nine A. M.—Slept at intervals during the night; countenance improved; heat of skin increased; pulse one hundred and forty; has had two free stools.—*Rept. calomel gr.* XX.—*Contin. Pil ex calomel c. opio.*

Two P. M.—Abdomen softer, and less tumid or painful; considerable discharge of bloody fluid from wound; countenance and respiration as formerly, but says she feels considerably relieved; no vomiting, skin rather hot, but moist; pulse one hundred and forty-eight,—indistinct; tongue white; thirst less urgent.—*Cont. Pil.—Rept. enema c. colocynth.*

22d.—Passed a restless night, and was occasionally delirious. Had one scanty stool last night from enema, and two fetid ones this morning from a dose of Oleum Ricini. Abdominal pain and tension lessened, but swelling not much abated. Complained in the morning of acute pain in the lower part of the chest, in the right side, which was removed by the application of eight leeches. Countenance more anxious; features sharp; pulse one hundred and fifty; mouth not affected.

In the afternoon she began to sink rapidly; her skin became cold and clammy; the pulse fluttered, and could not be counted. Violent delirium set in, and she died at half-past eleven P. M., about eighty-one hours after the operation, and sixty-nine after the apparent commencement of peritonitis.

On inspection, the intestines were found greatly distended with flatus. The cœcum and ascending colon to near its arch were of a deep-red colour, and adhered to the abdominal parietes by a thin layer of recent lymph. The peritoneum lining that part of the abdominal parietes from which the tumour was removed, was entire and uninjured, but highly inflamed,—the inflammation having extended up to near the diaphragm. The other intestines were healthy, and there was no effusion into the abdomen. A small quantity of blood was extravasated into the cellular tissue, between the peritoneum and the iliac muscles.

In the case now detailed there was, from the first, no difficulty in ascertaining that the tumour was confined to the parietes of the abdomen; but great difference of opinion prevailed as to whether it was seated between the layers of the muscles or immediately exterior to the peritoneum. The following are the reasons which induced me to adopt the former opinion. The tumour was distinctly circumscribed, and partially moveable; the fingers could be insinuated under its base, especially at the anterior and under part; and, when raised up, more resistance was felt between it and the abdominal cavity than might have been expected had the peritoneum only been interposed. Had it been covered by all the muscles, besides being less defined or moveable, it would not have been so prominent externally, but must have projected more into the cavity of the abdomen, and have probably occasioned attacks of peritonitis or of obstructed bowels: its attachment to the ribs must also have been different. Had it grown between the transversalis and the peritoneum, it must have got behind the ribs, and pushed them out; instead of which, it appeared, on external examination, to be attached to their outer surface. From these, and other circumstances which I need not state, my opinion was strengthened by the fact of my having frequently met with solid sarcomatous tumours between the layers of the abdominal muscles, but never between the muscles and the peritoneum.

Having attempted to ascertain the situation of the tumour, and being impressed with the belief that it might be extirpated without opening the cavity of the abdomen, I was next led to inquire what were the points of the case most likely to militate against the success of an operation. The apparent attachment of the tumour to the ribs and to the ilium was to be viewed as an unfavourable occurrence. I was satisfied that the latter connexion could be easily destroyed, but it was impossible to ascertain by examination what was the nature of its union with the ribs. I hoped, from the similarity between this case and the one immediately preceding, that the same facility in destroying its osseous connexions might be experienced. I was prepared, however, to divide the ribs, should this step be found necessary. It was also doubtful whether the tumour,

although situated between the muscles, might not be adhering so intimately to them as to render its removal impossible without including the surrounding muscles, by which the peritoneum would be laid bare, and the danger of the operation greatly increased. This doubt could be solved only during the operation, and not by any previous examination.

The peritoneal inflammation consequent on the operation was less extensive than was to have been expected. It appeared to commence in that portion of the membrane over which the tumour was situated, and to affect the bowel in contact with it. Although the patient was fully warned of the danger of such an occurrence, yet she came forward voluntarily, and expressed her determination to run all hazards rather than continue any longer under the disease. She was, in fact, in a state of miserable anxiety : her mind was distracted by the conflicting opinions she had received. She dreaded the gradual increase of her disease, and that it would probably soon destroy her ; while she had before her eyes the prospect of severe suffering and imminent danger should she submit to an operation. Is it wonderful that, in such circumstances, she determined to submit to a hazardous operation, rather than continue to bear the harassing anxiety of mind inseparable from the daily and hourly contemplation of a gradually advancing and incurable disease ?

2D.—TUMOURS OF THE PERITONEUM, OMENTUM, AND MESENTERY.—Tumours are not unfrequently developed in the peritoneum, grow to an immense size, and produce urgent symptoms ; yet the most accurate examination will seldom enable us to ascertain their seat or attachments. Sometimes these are confined to a small portion of the peritoneum, covering the abdominal muscles : they are, however, oftener found in connexion with extensive disease of the omentum.

CASE XXXII. *Disease of the Omentum simulating an enlargement of the Ovarium—Dissection.*—I was requested by a surgeon in town to visit Mrs. O., æt. forty-nine, on account of ascites, complicated with a tumour in the abdomen. Four years previously, she had discovered a small moveable

tumour in the right side of the belly, below the umbilicus, which did not give her pain nor increase in size for three years. She had then an attack of peritonitis, from which she recovered with difficulty, and was afterwards subject to acute pains in the abdomen,—nausea, vomiting and constipation. The tumour now increased rapidly; fluctuation was distinctly perceptible; she became emaciated; the pulse quick and feeble; the tongue red and parched; the urine scanty; and she had cough and dyspnœa.

As the abdomen was excessively distended with fluid, I could not obtain a satisfactory examination of the size or situation of the tumour. She had been informed that it might be removed by an operation; and it was chiefly to satisfy her on this point that I was consulted. With the view of relieving some of the most urgent symptoms, as well as to ascertain more accurately the nature and connexions of the tumour, I performed the operation of paracentesis, and evacuated nearly three gallons of yellow serum. I then discovered a tumour, about the size of a child's head, in the anterior and inferior part of the abdomen. It had a nodulated feel; could be moved from side to side; and did not appear to be attached to any of the subjacent viscera. The fingers could be pushed under it; and when it was raised up as far as the relaxed state of the abdominal integuments would permit, it was found fixed to the pelvis, by a pedicle about the thickness of the wrist. From its upper edge to about the arch of the colon, several other tumours of different sizes were felt; and, in connexion with these, there was a hard ridge, about the thickness of the finger, passing obliquely across the abdomen.

At first, I was inclined to believe that the right ovarium was the seat of the disease, and that the fluid had accumulated, not in the cavity of the peritoneum, but in an ovarian cyst, of which the nodulated tumours formed a part. On examining more minutely, however, I ascertained that some of the small tumours were attached to the parietes of the abdomen. The integuments were so relaxed and attenuated by long-continued distention, that I was able to pull them out to a considerable distance from the subjacent viscera; and, by grasping them between the extended hands, and rubbing the one against

the other, the irregularities alluded to were distinctly recognized. I was now satisfied that the peritoneum lining the abdominal muscles was affected, and that its surface was covered with tubercles, forming the disease so well described by Dr. Baron ;* but I still considered the large tumour connected with the pelvis to be an enlarged ovary. It is hardly necessary to state, that, from the extensive and complicated nature of the disease, no operation was had recourse to. She experienced, for several days, a good deal of relief from the tapping; but the water speedily accumulated, and all the urgent symptoms recurred. She died in two months.

Dissection.—In the cavity of the abdomen there were about ten pints of a dark-coloured viscid fluid. The peritoneum covering the abdominal muscles was much thickened, of a dirty yellow colour, and studded over with tubercles of different sizes. The intestines were hid by a large mass of tumours, extending from the epigastrium to the pelvis, arising, not from the ovaria, which were healthy, but from a diseased state of the omentum. At the upper part, the mass retained the natural attachments of the omentum to the stomach and colon; but inferiorly, it was fixed deep in the pelvis by preternatural adhesions, forming the thick stalk which was mistaken, during life, for an ovarian pedicle. The omentum was hard, and, in some places nearly cartilaginous; and the whole mass weighed nine pounds.

In this case it was impossible to distinguish, during life, the scirrho-cartilaginous degeneration of the omentum from an encysted enlargement of the ovary. The tumour, besides being fixed to the pelvis, had the irregular nodulated surface which usually accompanies this form of ovarian disease. Had any of the zealous advocates for gastrotomy been consulted, it is not unreasonable to conclude, from what they have done in cases of similar obscurity, that an operation would have been performed. To say nothing of the disappointment, on laying open the belly, and discovering a disease to which the knife could not be applied, we are warranted in believing, that fatal

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* See Enquiry, illustrating the nature of Tuberculated Accretions of Serous Membranes, &c. London—1819.

effects must have followed an extensive incision into so diseased a cavity. A case somewhat similar is related by Andral. After the existence of obscure symptoms of abdominal and uterine irritation for several months, a round tumour was discovered, rising from under the pubes and reaching to the umbilicus, which was supposed to be the uterus. It gradually enlarged, laterally, so as to occupy both iliac regions,—became irregular on the surface, and acutely painful on pressure. On dissection, the tumour was found attached above to the stomach and colon, and below to the uterus and its broad ligaments. It consisted of a scirrho-cartilaginous enlargement of the omentum.*

This disease of the omentum, when not accompanied by ascites, has also been mistaken for extra-uterine pregnancy. I have met with two cases of this kind,—one of which I shall detail very shortly; the other I had only an opportunity of examining once. This patient was seen by an immense number of medical men; and, when in Edinburgh, she was requested to submit to an operation, which she declined. I learned afterwards that the nature of the disease was correctly ascertained by dissection.

Case XXXIII.—*Disease of the Omentum mistaken for extra-Uterine Pregnancy—Dissection.*—A poor woman, about forty-one years of age, had menstruated twice after weaning her fourth child,—when this secretion ceased, and did not again return. She then began to complain of dull pains, with a feeling of weight in the belly,—of nausea, occasional vomiting, flatulence, and constipation. The abdomen became gradually more and more prominent, the mammæ enlarged, and she felt confident that she was pregnant. At the end of the sixth month from the commencement of these symptoms, the swelling became stationary; and in three weeks it had declined considerably. She had now frequent and severe attacks of pain in the abdomen, with increased disturbance of the bowels. Emaciation took place rapidly; the countenance became sharp and anxious; the pulse quick and feeble; the

* Clinique Medicale—Tome IV., p. 637.

tongue dry and florid; and the abdomen was still more prominent than natural, particularly in the hypogastric, umbilical, and left hypochondriac regions.

On examination, an ill-defined tumour, of a globular form, and about the size of an orange, was discovered, a little above and to the left of the umbilicus; whilst immediately under, and apparently in connexion with this, three or four ridges, separated from each other about a quarter-of-an-inch, were felt, and could be traced obliquely across the abdomen for nearly three inches. These appearances, when viewed in connexion with the history of the case, led to the belief that extra-uterine pregnancy existed. She referred all the symptoms to this cause, and succeeded in misleading many of the surgeons who examined her. Having previously seen the same deceptive appearances in a case of diseased omentum, I suggested that this might be the seat of the complaint, and dissuaded from an operation, which had been proposed by some medical men, and even agreed to by the patient.

She died in about three weeks. On dissection, the omentum was found so diseased as not to retain the slightest vestige of its original structure. It consisted of globular tumours of various sizes,—the largest of which was situated in the left hypochondrium, and had been mistaken, during life, for the head of a child. Their texture was fibro-cartilaginous, as were also the ridges, which extended along the whole breadth of the diseased mass, and which resembled the ribs of a child when examined through the parietes of the abdomen. The omentum was also attached to the intestines by old adhesions.

Gastrotomy may be performed with success when the fœtus has passed through a rupture of the uterus into the cavity of the abdomen. When this takes place, the symptoms which it excites are seldom very equivocal. It appears during labour, and is generally preceded by violent uterine action,—which is immediately followed by a complete cessation of the parturient efforts, and alarming collapse. The absence of the presenting part of the child, on examining per vaginam, and the irregular flattened feel of the abdomen, in which the outlines of the fœtus can be traced, will also materially guide the diagnosis. When the hand can be introduced,

however, through the lacerated opening into the abdomen, and the child extracted by the vagina, no surgeon would think of having recourse to gastrotomy.

This operation, although strongly recommended, is, I think, of more questionable utility when the fœtus has been extra-uterine from its commencement, and has grown either in the fallopian tubes, in the ovaries, or in the cavity of the abdomen. We can rarely obtain symptoms sufficiently characteristic of this form of extra-uterine fœtation : but, although an operation were performed, and our opinions found correct, we have difficulties still to encounter in opening the pouch, extracting the child and placenta, and arresting the hemorrhage, which will be more apt to lead to a fatal result, than were the case left to nature. The fœtus may remain for a great length of time in the abdomen without exciting very urgent symptoms; or it may contract adhesions to the walls of the abdomen, to the bowels or bladder, and be discharged by ulceration.

3d.—Tumours from Alvine Concretions.—Many of the abdominal tumours to be met with in practice, although arising from different and dissimilar parts, resemble each other so much in their external characters, and in the symptoms which accompany them, as to render the diagnosis extremely difficult, and in many cases altogether impracticable. Sometimes the function of the viscus in which the disease originates is so deranged, as to give rise to a train of symptoms sufficient to establish a satisfactory diagnosis; but, in a majority of cases, these are not so well marked as to indicate the exact seat of the disease. Thus, alvine concretions, of which we have many curious cases on record, when of considerable size, produce obstruction of the bowels, and occasional attacks of peritonitis; but the same symptoms attend, more or less, on almost all the tumours of the abdomen, whether arising from the peritoneum, omentum, mesentery, uterus, or ovaries. Sometimes the peristaltic action of the bowels is impeded by the weight and size of the tumour, and inflammation excited, or the same effect may result from irritation. I recollect having had under my care, when a

student of medicine, one of the city paupers, who had a tumour in the right side of the abdomen, about the size of the fist. From the account she gave of it, its apparent connexions, and the accompanying symptoms, it was supposed to be a concretion in the colon. She stated that, when it was first discovered above the right ilium, she could move it upwards and forwards, in the direction of the colon, to about the middle of its arch; but, as it increased in size, it became fixed between the crest of the ilium and the false ribs. She had severe pain and troublesome constipation, followed by repeated attacks of peritonitis.

After several consultations, it was agreed to lay open the abdomen and colon, and remove the concretion. I was present at the operation, which was performed by a respectable surgeon, with the concurrence of the first medical authorities of the place. When the abdominal integuments were divided, a large cyst came into view, which was opened, and found to contain hydatids. It was extensively attached to the concave surface of the liver, and, of course, could not be extirpated. It had so pressed on the ascending colon as to produce an impediment to the passage of the feces, and attacks of peritonitis, in every respect as well marked as if the tumour had existed within the cavity of the bowel.

Tumours of various and dissimilar kinds have been mistaken for alvine concretions. In one case, detailed in the Edinburgh Medical and Surgical Journal, (No. 33, p. 112,) an operation was strongly advised, but fortunately not performed, as the disease turned out to be scirrhus of the pylorus.

A biliary calculus is sometimes retained in the bowels, and becomes the nucleus of a concretion. The following case illustrates this, as also several other points to which I have already alluded:—

Case XXXIV.—*Alvine Concretion in the Ileon—Peritonitis—Death.*—W. G., ploughman, thirty-eight years of age, had an attack of jaundice, with acute pain in the epigastric and right hypochondriac regions, which was removed by emetics, purgatives, and venesection. He continued in good health

for three years, when he had occasional colic pains and constipation, for which purgatives and enemeta were employed with advantage. By-and-bye, however, the pains in the stomach and bowels became more severe, and the constipation more obstinate, accompanied with violent tenesmus and occasional vomiting. The stools were scanty, liquid, and frequently mixed with blood and mucus; the pulse above a hundred,—small and feeble; the tongue dry and loaded; and the abdomen swollen and tympanitic.

Immediately under the umbilicus, where he had a constant feeling of weight and distention, a solid but ill-defined tumour was discovered, which was slightly moveable from side to side. He had a violent attack of peritonitis, and became daily more and more exhausted; the flatulent swelling increased, so that the tumour could no longer be discovered; his stomach continued irritable; and he died in a state of great exhaustion and emaciation, two months from the commencement of the abdominal symptoms.

On inspection, the small intestines were found inflamed and covered with lymph. On tracing them down from the stomach, they were observed to increase gradually in size and thickness. The ileon was excessively distended, and contained, near its termination, a globular tumour, as large as an orange. This was found, on slitting up the bowel, to be an alvine concretion, of a dark-brown colour, rather rough, and porous externally, but, internally, of a more dense and compact texture,—the nucleus, consisting of a yellow-coloured biliary calculus, about the size of a kidney bean. The mucous tissue of the ileon was extensively ulcerated, and the calibre of the gut contracted immediately under the site of the tumour.

In this case the symptoms were as well marked as in any of those to be found on record; yet no satisfactory diagnosis could be established. We are advised, by Dr. Munro, sen., and some more modern surgeons, to cut down upon the colon, which is the most common receptacle of alvine concretions, and remove them by opening the intestine. This, although practicable, is, unquestionably, a bold, hazardous, and uncertain operation.

4th.—Ovarian Tumours.—The peculiar structure of the ovaria, and the office to which they are destined in the female economy, render them more susceptible of morbid changes than any other part of the uterine system. From the age of puberty till after the cessation of the menstrual secretion, they are large, vascular, and contain a number of vesicles; but, at a more advanced age, they are small and condensed. Hence, when they become diseased during the early or middle periods of life, encysted dropsy most frequently takes place; whilst old women, in whom the ovaries have become compact and shrivelled, are more subject to solid or sarcomatous enlargements.

Sometimes the first appearance of disease in the ovary consists in the formation of a cyst, which gradually enlarges, so as nearly to fill the abdomen; but, more frequently, sarcomatous enlargement takes place to some extent before any serous or gelatinous fluid is secreted. When this occurs, the tumour, at an early period, is smooth, compact, and globular; but, as it enlarges, it becomes tuberose, from the effusion of fluid, and the consequent development of cysts within the ovarian substance.

Case XXXV. *Sarcomatous enlargement of the left Ovarium —Dissection.*—S. M., æt. fifty-five, admitted 11th December, 1826. In the left side of the abdomen, immediately above Paupart's ligament, a hard tumour, nearly the size of a child's head, was situated. The integuments were relaxed, and could be easily moved over it; but it seemed to be fixed in the pelvis. It was somewhat tender when handled, and was the seat of severe lancinating pains. Till five weeks before her admission, the pains only affected her at monthly periods; but, subsequently, they became so frequent and severe, as to require opiates. She had a constant discharge of yellowish matter from the vagina; but the uterus appeared, on examination, to be healthy. Complained of difficult micturition, flatulence, constipation, and night-sweats. Tumour, when first observed, about three years and a half ago, was the size of an orange, and moveable. About a year after she ceased to menstruate,

when it began to enlarge more rapidly. Had born seven children,—the last, seventeen years ago.

This woman was sent to the Infirmary, by a surgeon in town, that the tumour might be extirpated. Although it appeared to me to be one of the least ambiguous cases of this disease, that I had met with, yet, considerable diversity of opinion prevailed among the members of the consultation regarding it. Some asserted, that it was a large mass of scirrhous glands, arising from within the pelvis, and probably involving the uterus; others believed it to be ovarian. From the gradual progress, situation, and large size of the tumour, I was satisfied that it was seated in the left ovarium. I was the more readily induced to form this opinion, as I had had an opportunity of examining it two years before, when it was about the size of the fist, and moved freely in the pelvis. She left the house in a few days, as all concurred in dissuading her from an operation. I did not see her again till a few days before her death, which happened in March following.

Dissection.—The left iliac, hypogastric, and umbilical regions, were occupied by the tumour, which was smooth, very hard, and adhered to the left side of the pelvis, from the middle of the iliac fossa to near the tuberosity of the ischium. It passed deeply down between the bladder and rectum, and adhered to the latter part, and to the sacrum, but not to the former. The adhesions were so firm and intimate, as to require a tedious dissection before the parts were separated and the disease ascertained to be an enlargement of the left ovary. The pedicle was as thick as the wrist, and involved the broad ligament and corresponding fallopian tube. The peritoneal covering of the tumour was one-fourth of an inch thick; of a dense texture, and opaque appearance. The tumour was solid throughout.

Sometimes the disease affects both ovaries and fallopian tubes, extends to the uterus, and proves fatal, without this combination being discovered during life.

Case XXXVI.—*Enlargement of both Ovaries—Dissection.*—A. M., æt. forty-three. The abdomen, which was as large as is usually observed in the ninth month of utero-gestation, was

completely filled with a smooth and apparently solid tumour. By relaxing the abdominal muscles, which were unusually thin, and by placing the patient in a favourable position, I was able to push my hands under the tumour, raise it slightly from the subjacent viscera, move it a little from side to side, and make the abdominal parietes glide over it. This appeared to show that no adhesions existed between it and the viscera or parietes of the abdomen; but it was impossible to ascertain the nature or extent of its attachments to the pelvis. It filled this cavity, and of course admitted of very little motion.

About nine years previously to this time, a few days after she was delivered of her last child, she had an attack of peritonitis, and observed the tumour in the abdomen soon after her recovery. It was situated above the right groin, and was small, circumscribed and moveable. Sometimes it descended so low into the pelvis, that she could not feel it through the abdomen; and, when so displaced, it always produced a sense of weight and pressure, with difficult micturition. In consequence of receiving a severe blow on the tumour, two months ago, she became subject to burning heat and acute pains in the lower part of the swelling, and to occasional attacks of leucorrhœa. Her health began to decline; she passed sleepless nights; had a quick, irritable pulse; a sunk and anxious countenance; and was affected with constipation, flatulence, vomiting, and nocturnal perspirations. The local disease was slightly relieved by leeches to the hypogastrium, fomentations, laxatives, enemata and occasional opiates; but her strength continued to sink rapidly, and she died about three months from the commencement of the urgent symptoms.

Dissection.— The tumour was slightly attached to the parietes of the abdomen and to the omentum; but it adhered very intimately to, and was with difficulty separated from, both sides of the pelvis, the fundus of the bladder and uterus, and the upper part of the sacrum. It was found to arise from the right ovarium, and had for its pedicle the broad ligament and fallopian tube, which were greatly enlarged, hard and tuberculated. The fundus uteri was also irregularly enlarged, and possessed the stony hardness and fibrous appearance of carcinoma. The tumour was of a solid texture, except to-

wards its posterior and inferior part, where it contained several cysts, filled with a dark-brown fetid fluid, in which were small coagula of blood. The lining membrane of these cysts, which were of different sizes, was covered with soft, purple-coloured, spongy excrescences; and the solid portions of the tumour surrounding them were softened and mixed with fetid matter. The left ovarium was likewise enlarged, and adhered to the corresponding side of the pelvis and to the large tumour.

In this case, the ovaria, right fallopian tube, and fundus uteri, were involved in the same disease, which was probably malignant. The blow which she received appears to have called into fatal activity at least a part of the diseased mass, which had previously been, from the slow progress of the tumour and the absence of pain, of an innocent character, and had thus produced the distressing symptoms, which continued, without interruption, till her death. It also shows, that we have no means of correctly ascertaining, during life, the various parts involved in the disease, the existence or absence of adhesions, or whether the tumour be benign or malignant. Although burning heat and acute pains may be felt, we are not entitled to infer that the disease is malignant. We often find these symptoms to exist in sarcomatous enlargements of the ovary, and to depend on acute or chronic inflammation of the peritoneal covering of the tumours. I believe that the inflammation so frequently observed during the progress of this disease, especially when the tumour is solid, is confined to the peritoneum, and usually ends in thickening and adhesions to the neighbouring parts. In rare cases, the inflammation is confined to the substance of the enlarged ovary, and must end in suppuration. I have met with only one instance of this termination: the tumour was about the size of a child's head, and contained, near its centre, several ounces of pus.

It cannot be expected that I should enter here into a minute investigation of the various morbid changes to be discovered in the different forms of ovarian disease. There are, however, several points of the highest importance, as regard the expediency and safety of extirpating these tumours by the operation of gastrotomy; for the clear and satisfactory elucidation of which, a careful and accurate examination of their post mortem

conditions is essentially requisite. I may be permitted, in offering the following abstract, as the result of my own investigation into the surgical pathology of this disease, to state, that I have seen, during the last fifteen years, above forty cases of ovarian tumours, chiefly among the poor in the district of this city which was lately under my care,—and that I have in my possession, the notes of fourteen dissections performed by myself, in all of which, the nature, extent and connexions of the disease were correctly ascertained. The following is the result:—

When the disease was first noticed, two of the fourteen patients were under thirty years of age; four were from thirty to forty; five from forty to fifty; and three above fifty. Before the disease proved fatal, it existed in two cases four years; in three, eight years; in one, nine; in four, eleven; and in other four, from thirteen to eighteen years. In four cases, the tumour was confined to the right ovary; in seven, to the left; and in three, both were implicated. In one, the ovarium was distended into a large cyst, without any appearance of solid growth, and was, of course, mistaken during life for ascites; in nine, chronic enlargement existed, in combination with one or more cysts containing fluid, (six of these were tuberose, and three smooth on the surface); and the remaining four were solid throughout. In twelve of these cases, adhesions, more or less intimate and extensive, existed between the tumours and the parietes and viscera of the pelvis; three of which had likewise become adherent to the abdominal parietes, omentum and intestines. Only two were free from preternatural adhesions; and in these the tumours were attached to the broad ligament by a slender pedicle. In three of the twelve cases, it appeared that the adhesions might have been divided without much risk or difficulty; but in the remaining nine, this procedure was altogether impracticable, and could not have been accomplished without imminent danger to all, and certain death to some. In eight of the adherent cases, the basis of the tumour was thick and broad,—the size of this part appearing to depend more frequently on the extent and intimacy of the secondary attachments to the pelvis, than on the magnitude of the tumours.

Before stating the objections which, from these and other considerations, I have been led to form against the operation of gastrotomy for the removal of ovarian tumours, I shall allude very briefly to the results of some of the published cases in which this treatment was employed. These remarks shall be confined to twelve cases, three of which occurred to Dr. M'Dowal, of Kentucky, in America; four to Mr. Lizars, of Edinburgh;* and five in Germany, to Deiffenbach, of Berlin, Hopfer, Chrysmer, and Martini.† Of these, four died and eight recovered. In nine, the tumours adhered, more or less extensively, to the contiguous parts: in four of these, the adhesions were divided, and the tumours wholly removed; in one, only a part of the disease was extirpated; and in the remaining four, the extent and intimacy of the existing adhesions prevented the operations from being completed. In one of the cases, the abdomen was opened, and no tumour found: this patient fortunately recovered. Besides the extent of the adhesions, the operator was deterred from removing the tumour in another case, by the number and size of the arteries, which were seen to pulsate violently in the pedicle.

From these results, as well as from the experiments of modern physiologists, it would appear that gastrotomy, although a dangerous, is not necessarily a fatal operation. The improvements recently effected in the surgery of the abdomen have tended materially to dispel the unfounded fears so generally entertained by the profession regarding the danger from wounds of this important cavity;—at the same time, I cannot refrain from thinking that there has been more boldness than judgment displayed in many of the operations lately performed for the extraction of diseased ovaria. It is, indeed, apparent, on the most cursory examination, that, in some of the cases above alluded to, gastrotomy was rashly performed in the absence of symptoms sufficiently characteristic of the seat, nature, or connexions of the disease; whilst, in others, the same unwarrantable procedure was adopted, although it was clearly indicated, by the tumours having been frequently the seat of

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* Observations on Extraction of Diseased Ovaria. Edin.—1825.

† Archives Generales,—Tome XX. Mai, 1829.

acute pain, that adhesions to the neighbouring parts existed. The following reasons appear to me sufficient to show that the operation of gastronomy will be found inapplicable to a great majority of ovarian tumours :—

1st. The difficulty of establishing a correct and satisfactory diagnosis. Mr. Lizars corroborates the opinion of Morgagni, that it is impossible to ascertain, by the symptoms, whether a tumour in the abdomen be ovarian or not. Various circumstances tend to obscure this part of the subject. The deep situation of the tumour must prevent an effective examination, at least until it has attained a large size ; and, even then, the difficulty, although lessened, is not nearly removed. We must also recollect, that we may encounter a tumour in the abdomen, arising from disease of the omentum, which has all the external characters of the tuberose enlargement of the ovary. I have also met with a case, in which an immense tubercle of the uterus could not be distinguished from a sarcomatous enlargement of the ovary. When the abdominal integuments are tense, and loaded with fat, and the bowels distended, we often find a tolerably defined projection in the hypogastric and umbilical regions, which has a strong resemblance to a tumour within the abdomen. I have seen cases in which it was impossible to ascertain whether this depended on obesity or disease.

2d. We have no means of correctly ascertaining the size of the pedicle, or whether preternatural adhesions exist, and to what extent, between the tumour and the contiguous parts. The root of the tumour is generally small, and formed by the broad ligament; but I have witnessed two dissections, and there are others on record, in which, from the great size of the pedicle, and its enlarged blood-vessels, extirpation of the disease could not have been undertaken. These objections are, however, of minor importance, when compared with the intimacy and extent of the adhesions, which both the root and body of the tumour so frequently contract with the neighbouring parts, and which cannot be discovered by the most deliberate and careful manipulation. Mr. Lizars, who is one of the most zealous advocates for this operation, while he acknowledges the difficulty of this investigation, recom-

mends that the abdomen be laid open; and if adhesions exist, that they should be divided. I cannot believe that a procedure, so uncertain in its results, and so dangerous to the patient, is likely to be adopted. Who, unless under the most desperate circumstances, would thus proceed on a voyage of discovery into the abdomen, through an incision from sternum to pubes? Are we justifiable in considering this as a judicious and commendable method of exploring the state of the pelvic and abdominal viscera? On the contrary,—is it not rash and dangerous, and does it not display more of the reckless boldness of the charlatan, than of the cool and dispassionate procedure of the scientific surgeon? We know the frequency, extent, and intimacy of the adhesions, by which ovarian tumours are secured to the neighbouring parts, and we can form some estimate of the difficulties and dangers to be encountered in removing them by surgical operation. If we compare these with the trifling uneasiness which the disease generally produces, and consider that it may continue for many years without seriously injuring the health, we ought to pause before we have recourse to gastrotomy.

I may observe, in conclusion, that Mr. Lizars is far too sanguine in his expectations of success. Before these can be realized, he must investigate the history and peculiarities of each case more minutely,—reject many similar to those he has already operated on, as unfit for the knife,—and make a more careful and judicious selection than he appears to have hitherto done. Dr. Blundell,* who has also investigated this subject with much candour and judgment, while he appears to view this operation in a favourable light, acknowledges, at the same time, the many serious objections that may be advanced against it.

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* Researches, Physiological and Pathological; and Lancet, Nos. 288, 290, 291.

ON HERNIA.

CASE XXXVII.—*Strangulated Scrotal Entero-Epiplocele—Intestine burst by the Taxis—Operation—Death.*—J. P., æt. thirty-nine, admitted 19th February, 1827, at seven P.M. He had been subject, for twenty years, to a reducible inguinal rupture of the left side; and, during the last two years, a small portion of it remained irreducible, and prevented him from wearing a truss. The symptoms of strangulation had existed for ten hours; and during a considerable part of that time, a surgeon had made powerful and continued efforts to return the displaced parts. These produced at first a good deal of pain in the tumour; which, however, along with the vomiting, ceased for several hours, after he felt as if something had been pushed into the abdomen.

A consultation was immediately called, when, after one of my colleagues had employed the taxis rather forcibly for about ten minutes, it was agreed to apply cold to the tumour, and attempt to evacuate the bowels by a colocynth enema. I had not an opportunity of seeing this patient for more than an hour after. The tumour was then about the size of the fist,—had a pyriform shape, an irregular surface, and was rather firm and doughy anteriorly, but smooth and elastic posteriorly,—the outer part being apparently omentum, behind which a fold of intestine was probably situated. The lower part of the scrotum was as large as a child's head, the swelling being chiefly confined to the left side. It was tense, smooth, and of a livid colour. The integuments were considerably thickened; and they crackled under the fingers, when firm pressure was applied, similar to what is observed from the effusion of fibrine around a sprained joint. There was also obscure fluctuation, apparently from a collection of fluid in the cavity of the scrotum. These appearances evidently depended on the effusion of blood, both into the integuments and the interior of the scrotum, which was to be attributed to the forcible pressure employed previous to his admission. His pulse was one hundred in the minute, the

respiration slightly hurried, and the bowels obstructed; but there was no anxiety of countenance, and only slight pain in the belly; the vomiting had ceased, and, altogether, the symptoms were so mild that an operation was not immediately called for; yet it will be afterwards seen, that before this period the injury was done to the bowel which led to a fatal result.

From the too forcible endeavours previously made to reduce the hernia, and from the great swelling of the scrotum, farther force could not be directly or usefully applied. I considered it, therefore, highly improper to renew the taxis, which could only tend to an increase of the local injury, and an aggravation of all the symptoms. At one, A. M., I found him much worse; no alvine evacuation had been procured; the abdominal pain was acute and diffused; he vomited every ten minutes; his pulse was one hundred and forty, small and sharp; his breathing hurried, and his countenance sunk and anxious. The scrotum was now as large as a man's head, the purple discolouration having extended over its whole surface, along the perinæum to the anus, and over the right groin, in the direction of Paupart's ligament, to near the anterior spine of the ilium; the only unaffected part being about an inch of the integuments over the neck of the hernial tumour. It was nearly four o'clock before I could obtain the attendance of one of my colleagues, to sanction an operation and assist in its performance.

An incision, two and a half inches in length, was made over the neck of the tumour. When the sac was opened, fully a pound and a half of dark-coloured blood escaped; a considerable quantity of which was pressed up from the depending part of the scrotum. The hernial tumour consisted of a large piece of omentum, which was covered with coagulated blood, and of nearly two feet of intestine. The omentum was contused and lacerated, and the protruded gut, which was afterwards found to be the ileon, was almost wholly separated from the mesentery. It contained several rents, which passed in a longitudinal direction; and into each of these openings two or three fingers could be introduced. There had been no escape of feculent matter, but the gut was flaccid, and of a deep purple colour; the discolouration depending not on gangrene, but on the extravasation of blood into the cavity of the bowel, and between its coats.

Two strictures, about an inch separate, one at the outer, and the other at the inner ring, were divided. I then attempted to return the uninjured parts of the bowel into the cavity of the abdomen; but after several attempts this was found impracticable. The impediment did not arise from the smallness of the hernial aperture, or from the presence of adhesions; but in consequence of the empty and relaxed state of the bowel, and the great distension of the parts within the abdomen, I found that, although a small portion was pushed up before the finger, it was impossible to prevent it from being instantly re-protruded.* From the dreadful condition of the parts in this unfortunate patient, I had no alternative, but either to allow the bowel to remain in the sac, covering it with a poultice or other emollient application, or to excise it. Had the patient survived the effects of the disease and operation, I have no doubt, from the great injury which the bowel had sustained, and from the extensive destruction of its mesenteric attachments, that it would soon have become gangrenous, which termination would probably have been accelerated by the constant irritation to which so large a piece of intestine must have been exposed in an open wound. The only prospect of benefit from treatment, seemed to consist in procuring, as speedily as possible, a free feculent discharge, through an artificial anus; and as this could be effectually obtained only by dividing the gut as it emerged from the inguinal canal, I proceeded to excise the bowel; an operation, it must be acknowledged, of the most formidable kind, and only warrantable under the desperate circumstances I have attempted to describe.

From the vascular state of the small portion of the mesentery attached to the bowel, I found it necessary to pass a ligature around it to prevent hemorrhage; the gut was then divided in two places and removed. Both ends of the bowel were secured in the wound; they did not collapse, but retained

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* Boyer gives a case which occurred to Petit. Although the stricture was divided, and the gut found to be free of adhesions, it could not be returned. He was advised to cut off the part, but he allowed it to remain in the wound, and covered it with pledgets of linen; the greater part of it returned spontaneously into the abdomen, the wound healed, and a cure was accomplished.—Traitè des Malad. Chir., tom. viii. p. 126.

their natural calibre from thickening of the coats by previous inflammation. A piece of omentum, nearly the size of the fist, was also removed; after which, two stitches were inserted into the lower half of the wound, and simple dressing applied.

The patient bore this painful operation with remarkable firmness; but when it was finished, he appeared much exhausted, and his pulse was rapid and tremulous. In order to procure alvine evacuations, he was ordered a compound colocynth pill every third hour, and an injection through the upper end of the divided bowel. No feculent discharge was procured; his strength decreased rapidly; he vomited almost incessantly; his belly became tympanitic; and he died at eleven o'clock, about seven hours after the operation.

It is impossible to furnish a more useful or impressive commentary on the danger of employing force in the reduction of a hernia, than by the case now detailed. The disease was of twenty years' standing; the intestine was free, although the omentum was adhering to the sac; the inguinal ring was large; and every thing was in the most favourable state for the successful use of the taxis; nevertheless, it was productive, and that in the hands of a well-informed surgeon, of the most disastrous consequences; the omentum intestine and mesentery were torn, and an immense effusion of blood produced.

Few surgeons will be inclined to deny the propriety of employing the taxis in the reduction of a strangulated hernia; but there exists great difference of opinion as to the cases in which it may be advantageously had recourse to, the extent to which it should be carried, and the force we are warranted in employing, before an operation is determined on. I must object, in the first place, to the indiscriminate use of force in every case, without properly regarding the state of the tumour, the urgency of the symptoms, or the duration of the disease. It must indeed be obvious, that if the strangulation is of long continuance, and the hernia highly inflamed, the taxis, if tried at all, must be employed for a short time only, and with the greatest caution, otherwise all the symptoms will be materially aggravated, and destructive consequences produced. That such consequences have resulted from even a moderate use of force, I have had repeated opportunities of

observing; and I feel satisfied that, in many similar cases, the safest practice will be found to consist in the immediate performance of the operation. It is this promptitude in the use of the knife, and a more gentle employment of the taxis, which render the operations of the Continental surgeons more generally successful than are those of the British. It is impossible to give any correct directions as to the quantum of force to be employed in the reduction of these tumours; but, if moderate and steady pressure does not succeed, it would be in the highest degree dangerous and reprehensible, were we to adopt the rude, powerful, and unscientific efforts, which some recommend and practise. It is not by force, but by tact, that we shall most generally succeed in the replacement of a hernia. I have reduced many hernial tumours in a state of strangulation, by cautious and steady manipulation, proper position, &c.; but I have never employed much force, and, I hope, I shall never be tempted to increase it.

It must be acknowledged, however, that, in the hands of my friend, Mr. M'Leod, the taxis has been eminently successful; and, I have reason to believe, that, since the publication of his paper on this subject, in No. XII. of the Glasgow Medical Journal, the practice has, on the faith of his testimony, been tried by a good many surgeons in this neighbourhood. That this treatment has been adopted, without any bad consequences resulting from it, I am prepared to admit. The coats of a healthy intestine are, from their toughness and elasticity, capable of resisting a good deal of force, when it is cautiously and steadily applied; but it requires no stretch of imagination to suppose that they may give way, and be torn under violent or undue pressure. This unfortunate result may attend the manual efforts of any surgeon, however deficient he may be in physical power; but the danger is mightily increased, when we find those members of our profession, distinguished for their muscular power, making every effort to reduce a strangulated bowel, especially when aided by two or three able-bodied assistants. Can any rupture occur, for the replacement of which such combined and concentrated efforts are at all justifiable? or is it for a moment to be supposed, that we can, while thus assisted, regulate so safely and correctly, as

circumstances may demand, the exact force requisite for returning the displaced parts?

Sir A. Cooper has met with several cases, in which the intestine was ruptured by violent efforts at reduction.* Pelletan has frequently discovered, from the same cause, clots of blood in the sac, with an ecchymosed state of the intestine and omentum.† Mr. Dewar, of Dunfermline, details a case in which, on opening the sac, feculent fluid was discharged through a ragged opening in the gut. The patient was a female, and the hernia crural. The injury was produced by a surgeon, who opposed an operation, but had "patiently pressed the rupture" for some time.‡ I have examined the preparation of a burst intestine, in the museum belonging to the Portland-Street Medical School. The injury was produced by a surgeon in town, when attempting to return the bowel which was strangulated. I was present in autumn last, when two respectable surgeons of this place were attempting to reduce a large scrotal rupture, which had been in a state of strangulation for about four hours. While the patient lay in a hot bath, the neck of the tumour was managed by the one surgeon, while the other grasped the lower part of it. After continued and rather powerful efforts, the hernia was reduced; but the patient died in a few hours. On dissection, the intestine was found ruptured, and the peritoneum, in several places, peeled from its surface.

It sometimes happens in old herniæ, that the gut, from frequent protrusion, and the pressure to which it is subjected by the opening in the abdominal parietes, becomes diseased. Whether this morbid change consists in a thickening, or attenuation of the bowel, it is generally accompanied by a softening of all the textures of that portion of the tube implicated in the hernia. In such a combination, it is evident that the taxis, unless used with the utmost caution, will probably produce fatal effects; and, as we have no means of ascertaining the existence of this disorganization during the pa-

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* Lectures by Tyrrell, vol. iii. p. 27.

† Clinique Chirurgic., tom. iii. p. 381.

‡ Edinburgh Medical and Surgical Journal, No. 96.

tient's life, it should form an additional reason against the employment of force in the reduction of the tumour.

In May, 1827, when walking along one of the public streets of this city, I was requested by a surgeon to accompany him into his shop, and examine a poor woman who had fainted a few minutes after the reduction of a strangulated crural hernia on the right side, which had annoyed her for more than twenty years. The tumour had been in a state of strangulation for about eight hours; but the symptoms were not urgent. After a gentle use of the taxis for five minutes, the hernia went up with the usual noise, and was almost immediately followed by syncope. On examination, I found her skin covered with cold perspiration; the pulse rapid and feeble; and she complained of acute pain in the right inguinal region. She was immediately carried home, but continued to get worse. The pain became diffused; vomiting and hiccup occurred; the belly was tympanitic; and, without reaction taking place, she died in less than seven hours. I was present at the dissection, and found a lacerated opening in the middle of the ileon, which could admit three fingers. The intestine was softened and thickened, but not in a state of gangrene; and through this preternatural opening, the contents of the alimentary canal had escaped and excited peritonitis.

The following case shows the troublesome effects which occasionally result from the application of cold to a strangulated hernia:—

Case XXXVIII.—*Strangulated Crural Hernia of the right side—Operation followed by Erysipelas and copious Suppuration—Cure.*—Mrs. S., æt. forty-two, had had a reducible crural hernia of the right side for several years. It had been in a state of strangulation for ten hours, when I was requested to visit her. The tumour was about the size of a hen's egg, somewhat painful on pressure, but without much tension; the belly was swollen, rather tumid, and tender for two or three inches above the crural aperture; she had nausea, and occasional bilious vomiting; the pulse was one hundred and thirty, and sharp; the tongue dry; the thirst urgent, and the bowels

constipated. After venesection, the warm bath and the taxis were employed ineffectually. An operation was proposed, to which she refused her consent; a bladder, containing pounded ice, was therefore applied to the tumour. This was continued for four and a half hours; but as the symptoms increased in urgency, she was at last induced to submit. On dividing the integuments, which were rather cold, and of a purple colour, there was a good deal of troublesome bleeding from the subcutaneous veins, which obscured the subsequent steps of the operation. The sac contained a knuckle of dark-coloured intestine, and three drachms of bloody serum. The stricture was very tight; and when it was divided, and the gut returned, there flowed out from the abdomen fully half an ounce of limpid serum. A portion of the sac, which was much thickened and detached, was cut off, and the wound secured by sutures, compress and bandage. The menses were flowing during the operation.

The abdominal symptoms were speedily relieved after the operation, and free alvine evacuations procured. The wound, however, became inflamed; and erysipelas took place, which ended in partial sloughing and profuse suppuration in the groin. The patient became exhausted and irritable; the tongue red and glazed; the pulse rapid and feeble; and the bowels irregular. She remained for a fortnight in rather a doubtful state; but as she gained strength, the sore contracted, and ultimately cicatrized.

Case XXXIX.—*Strangulated Entero-Epiplocele—Operation—Excision of a portion of the Omentum—Cure.*—Mrs. M., æt. fifty-eight, had laboured under a strangulated crural rupture of the right side for forty-eight hours, when I saw her, for the first time, on the 10th December, 1826. The tumour, which was about the size of half an orange, was tense, elastic, and painful; and the abdomen was tumid, tender on pressure, and the seat of frequent paroxysms of spasmodic pains. She had vomiting and hiccup; the countenance was flushed and anxious; the bowels obstructed; and the pulse sixty, and sharp.

She was immersed in a hot bath, bled, *ad deliquium*, and the taxis repeatedly tried, but without success. I therefore

proceeded to the operation, and found two drachms of amber-coloured fluid in the sac, a portion of thickened omentum, and a small fold of dark-coloured intestine. The stricture, which was so tight as hardly to permit the point of the finger nail to pass under it, was divided directly upwards. The intestine was easily returned; but as the protruded omentum was diseased, it was cut off, the adhesions it had contracted to the neck of the sac were destroyed, and it was then replaced in the abdomen. The sac was greatly thickened, and so separated from the surrounding parts, probably by the efforts made to reduce the tumour, that I thought proper to excise it, in order to prevent that inflammation and tedious suppuration, which its presence in the bottom of the wound is so apt to produce.

She had acute peritonitis, requiring copious bleeding, leeches to the abdomen, &c., and two days elapsed before the bowels were freely evacuated. After this, the unfavourable symptoms disappeared, the wound healed by the first intention, and in three weeks she was able to wear a truss.

The next case shows the combination of an external with an internal hernia, the obscurity in which the diagnosis is sometimes involved, as well as some other points of practical importance.

Case XL.—*Strangulated Entero-Epiplocele—Operation rendered unsuccessful by the existence of a Mesenteric Hernia.*—R. M., æt. twenty-eight—January 4th, 1827—twelve years previously, while engaged in duty as a seaman, fell from a height, and in three days he observed a tumour in the left groin. This was ascertained to be a hernia: it was easily reduced, and could be prevented from returning by the application of a truss. Five days ago, while raising a drunk person from the ground, felt pain in the left groin, and observed that the rupture had descended into the scrotum. In a few hours, ineffectual attempts to replace it were made by a surgeon; and, on the following day, the symptoms becoming more urgent, another surgeon was called in, who also failed in the employment of the taxis. The left side of the scrotum was occupied by a pyriform tumour; from the upper part of which, a hard, ir-

regular, well-defined cord, about two inches in length, was felt passing up, and entering the inguinal ring; it had more the feel of a thickened and enlarged cord, than of the neck of a hernial tumour. On grasping and raising up this band, however, a more elastic part was felt below, where an impetus was recognized on coughing; and here the pain, on pressure, was intolerable. The tumour fluctuated distinctly at the anterior, inferior, part of the scrotum; but the greater part of it was hard and irregular, and could not be distinguished from the testicle.

This tumour had a strong resemblance to an inflamed testicle, with enlargement of the cord, and partial effusion into the tunica vaginalis; and this was the opinion of two respectable surgeons who examined the case minutely. It appeared to me, however, that the cord-like substance which was so distinctly felt, was thickened omentum; behind which, there was probably a fold of intestine in a state of strangulation. I therefore urged the necessity of an immediate operation, but the patient refused to submit.

He vomited incessantly a thick yellowish-coloured and feculent fluid; had troublesome hiccup; an anxious and collapsed countenance; a dry and furred tongue; and a pulse above a hundred and thirty. The bowels were obstructed, and the abdomen tumid, tympanitic, and intolerant of pressure. He was bled to twenty ounces, and ordered the compound colocynth pill, repeated enemata, fomentations, &c.

On the 5th, the vomiting and hiccup were incessant, and the stercoratious matter ejected was still more abundant. He expressed an anxiety, on the evening of the 6th, exactly eight days from the commencement of strangulation, to have the operation performed; and, although the circumstances were desperate, I agreed to give him the chance which such a step could alone afford him. The tumour was larger, and its neck less defined; but it was firm, tense, and covered by integuments of a purple colour; the abdomen was immensely swollen and tympanitic; the breathing laborious, and all the other symptoms aggravated.

I made an incision two and a half inches in length over the neck of the tumour, which was followed by a good deal of cu-

taneous hemorrhage, chiefly venous. The sac contained one ounce of dark-coloured, rather fetid fluid; and a large, livid, soft mass of omentum, apparently gangrenous, which was intimately adhering to a fold of intestine, three inches in length, lying at the posterior part. The gut, which was of a deep chocolate colour, but not actually gangrenous, had an opaque spot on its surface, apparently from a deposition of lymph. About one half of the omentum was removed, the other half adhered to the bowel so intimately as to render its excision impracticable. The stricture was divided, the adhesions of the omentum and intestine to the neck of the sac were destroyed by the finger, and the parts returned into the abdomen.

On the 7th, the repeated use of large stimulating enemata, purgatives, &c., failed to procure any alvine evacuation, and the other symptoms were not relieved. On the morning of the 8th, he appeared somewhat easier; he had slept for an hour or two; had passed two scanty stools, with much flatus; the swelling and pain of the abdomen had rather decreased; and he had ceased to vomit for more than twelve hours. In the evening, the unfavourable symptoms again predominated; the stercoratious vomiting, hiccup, abdominal swelling, dyspnœa, coldness of the body, cadaverous look, and fluttering pulse, showed that the disease would speedily prove fatal.—He died on the 9th, at three o'clock, P.M., seventy hours after the operation.

Inspection.—The small intestines were enormously distended, of a dark red colour, adhering to each other by recent lymph, and to the abdominal integuments on the left side of the pubes. The omentum, which was tightly stretched over the intestines, and attached to the portion of gut which had been strangulated, was dark-coloured, and so soft as to yield readily to the fingers. There was no effusion into the abdomen, but the intestines were smeared in some places with brownish pus. The ileon was found to have passed deeply into the pelvis, through an opening in the mesentery. It had not contracted any preternatural adhesions, but it was evidently constricted and gangrenous, and was with difficulty drawn out from its unnatural position. The upper part of the same bowel had been included

in the inguinal hernia; it was doubled on itself, adhering, and in a state of gangrene.

It is rather surprising that this patient should have survived so long, while there existed both an external and internal rupture in a state of strangulation. That portion of the ileon which passed through the aperture in the mesentery, was so folded down and compressed, that I could hardly suppose any of the contents of the intestinal canal could have passed through it. Such a combination could not have been discovered during life; its existence was, therefore, calculated to frustrate every plan of treatment.

Case XLI.—*Strangulated Crural Hernia—Operation—Intestine adhering to the Sac—Cure.*—Mrs. P., æt. fifty-one, admitted 1st June, 1831, at two o'clock, P. M. There was situated in the right groin an ill-defined tumour, about the size of a walnut, which was tense, firm, and painful, having been in this state for forty-eight hours. There was a good deal of anxiety, restlessness, sense of painful constriction across the abdomen, nausea and vomiting; tongue furred and dry, thirst urgent, skin covered with clammy perspiration, pulse one hundred and eight, sharp; respiration painful and oppressed, obstinate constipation. She was immersed in a hot bath, and continued, for about ten minutes, to masticate a piece of tobacco, and swallow the saliva. Violent sickness and vomiting were soon produced, and while she lay in a state of collapse, the taxis was gently but steadily employed. As the tumour was extremely small, tense, and painful, and the symptoms of strangulation were urgent, an immediate operation was resolved upon. It was performed an hour after her admission. The limb was allowed to hang over the end of the table, to make the tumour project and become more visible. After dividing the integuments, superficial fascia, and three condensed layers of cellular substance, nearly one drachm of turbid serum escaped. I immediately supposed that the sac was opened, especially as I had exposed a smooth, purple-coloured substance, which had a strong resemblance to a piece of intestine. On more minute examination, I found that the bowel was still covered by the sac, which was divided with great caution and

considerable difficulty, as it could not be laid hold of, or raised from the surface of the bowel. It did not contain a drop of fluid, but adhered intimately to the bowel, a circumstance which the history of the case did not lead me to expect. The adhesions were easily destroyed by a probe; and the stricture, which was exceedingly tight, was divided with Weiss's knife. The intestine was readily returned, and the wound closed.

In three hours after the operation, she had several copious stools. The pulse for several days ranged from a hundred to a hundred and twelve in the minute; and she had considerable flatulent distention of the belly, with tenderness on pressure and coughing. For these symptoms, leeches, fomentations, purgatives, and enemata, were employed; and she had several doses of calomel and opium. The wound suppurated, and was slowly healed by granulation. She was dismissed, cured, on the 22d of July.

The operation was rendered more than usually difficult by the small size and great depth of the tumour, the existence of fluid between the fascia propria and the sac, the intimate and extensive adhesions of the sac to the bowel, and the unusual tightness of the stricture. When the fluid occupies this unusual situation, we are apt to suppose that the sac has been opened, and proceed to divide the stricture, and return the parts into the abdomen. Had such a procedure been adopted in the above case, it is obvious that, from the adhesions between the intestine and sac, the symptoms of strangulation must have continued unrelieved, and the patient have died.

It is but rarely that the omentum enters into the formation of a crural hernia; and, when it does so, it is generally the lower or floating margin of this membrane that is protruded. But in the following case, which lately occurred to me in private practice, a central portion of the omentum escaped, and formed a complete sac, in which a knuckle of strangulated bowel was lodged.

Case XLII.—*Strangulated Crural Entero-Epiplocele—Operation—Intestine included in an additional Sac, formed by the Omentum—Cure.*—I was requested by Mr. William Easton,

surgeon in Calton, to visit Mrs. C., aged fifty-five, at nine o'clock, P. M., on the 31st January, 1832. She had been labouring for thirteen hours under the symptoms of a strangulated hernia. The tumour, which occupied the situation of the right crural opening, was about the size of a small hen's egg; it was tense, painful, and turned up over the outer surface of Paupart's ligament; there was also swelling, tension, and pain of the right side of the abdomen; vomiting, and constipation. The pulse was slightly accelerated; the countenance anxious; and there was a good deal of prostration of strength. She had had a reducible crural hernia of the left side for many years, but had never observed a tumour in the right groin till that morning, when it suddenly protruded, and became strangulated.

Having failed by a moderate use of the taxis, I immediately proceeded to the operation. On opening the sac, a small quantity of limpid serum escaped, and a considerable portion of omentum presented itself. This was not in its usual soft doughy state, but was of a globular shape, and had a tense elastic feel. On minute examination it was found, that either fluid, or probably a portion of intestine, was contained in a sac formed by the omentum. I therefore pinched it up with a pair of forceps, and made a cautious opening into it, when a considerable quantity of serum escaped: it was then laid open to the same extent as the peritoneal sac, and found to inclose a knuckle of dark-coloured intestine. The stricture was divided; the gut returned; the protruded omentum, which had contracted slight adhesions to the neck of sac, was cut off; the bleeding, from one of its vessels, was arrested by torsion; the adhesions were destroyed, and the rest of it returned: immediately after which, more than an ounce of limpid serum escaped from the cavity of the abdomen. She speedily recovered.

CASE XLIII.—*Strangulated Crural Hernia—Operation successful—No fluid in the Sac.*—E. M., æt. thirty, admitted on the 27th April, 1832, at seven o'clock, P. M. Twenty-four hours previously, when in the act of pushing away a basket-full of yarn, her foot slipped, and she fell to the ground. In

two hours afterwards was seized with violent pain of the abdomen and vomiting, which became gradually more urgent. A small tumour was discovered, for the first time, in the right groin, which had all the characters of a crural hernia. It was tense, painful, and about the size of a walnut; the abdomen was tumid, and acutely painful on pressure; the pulse was a hundred and twenty, and sharp; the countenance anxious; the bowels constipated; and she had occasional hiccup.

As she had been bled copiously, and the taxis employed before her admission, and as the tumour was small, recent, and productive of urgent symptoms, the operation was at once performed. The hernial sac was covered by a thick layer of adipose substance, which had a striking resemblance to omentum. The sac contained a small knuckle of intestine of a dark chocolate colour, but not a drop of fluid. The stricture was so tight, as barely to permit the introduction of a small director. After the gut was returned, more than an ounce of straw-coloured fluid escaped from the abdomen. This case did well.

In a recent crural hernia of small size, if there is little or no fluid in the sac, it is sometimes difficult to ascertain when this part has been laid open and the intestine exposed. I have seen the fascia propria twice mistaken for the sac; and in both cases the gut was returned into the abdomen, with the sac unopened. Death was the result.

Case XLIV.—*Strangulated Crural Hernia in a Male—Operation successful.*—J. S., an emaciated and infirm man, æt. sixty-six, had laboured under some of the symptoms of a strangulated hernia for five days previous to his admission into the Infirmary, on the 4th of May, 1832. I was desired to attend him, in the absence of my friend, Dr. Auchincloss; but before a consultation could take place, he returned to his own house, and requested my attendance there. In less than an hour after his removal, I saw him again, along with my friends, Messrs. Angus and Knox, and found that he had been subject, for nine years, to a reducible inguinal hernia on the left side, for which he wore a truss. On examination, the hernia, which was about the size of half an orange, was found to be crural,—

the inguinal aperture through which the old tumour protruded, being distinctly felt immediately above, and so dilated that two fingers could be thrust into it. There was a little pain on pressing the neck of the tumour; but there was none in the abdomen, which was free of swelling. The pulse was sixty-five,—the vomiting had ceased for two days. Several ineffectual attempts had been made to open the bowels, and the taxis employed, at different times, by four or five surgeons. Although the symptoms were exceedingly mild, it was deemed proper to proceed to the operation. The sac contained half an ounce of fluid, and a fold of dark-coloured intestine. When this was replaced, several ounces of serum escaped from the cavity of the abdomen. The cure was considerably retarded by suppuration of the sac.

The absence of urgent symptoms in this case, would probably have induced some surgeons to have condemned an operation. These symptoms were prevented from becoming severe, by the feeble and emaciated state of this patient's body; yet, on inspecting the gut, the necessity for an operation could not be doubted. To have waited till the symptoms of strangulation had become more decided, was to have diminished greatly the chances of ultimate recovery.

The following case is interesting, as showing the extension of gangrene from the integuments of the scrotum, to the sac of a reducible hernia, giving rise to an artificial anus, which was ultimately cured, without the bowel adhering to the neighbouring parts.

Case XLV.—*Gangrene of the Integuments of the Scrotum penetrating the Sac of a reducible Hernia, and giving rise to an artificial Anus which was cured.*—R. C. æt. sixty, admitted November 11, 1831. He had had a reducible scrotal hernia of the left side for thirty years, and of the right for twelve, with a hydrocele of the right tunica vaginatis, for more than a year. The hydrocele had been repeatedly punctured,—the last time a fortnight ago; immediately after which, pain, redness, and swelling of the scrotum took place, and ended in gangrene.

On his admission, the scrotum was the size of a man's head;

the slough measured eleven inches from the root of the penis to the most depending part, and eight inches transversely: there was a distinct line of separation between the dead and the living parts.

On the 22d, I found, on removing a loose portion of the slough, which evidently involved the septum scroti, that a small livid opening, on the inner side of the left hernial sac, was exposed, through which there was a copious discharge of thin feculent matter. It was now evident that the gangrene had extended to the intestine, and that an artificial anus was formed. Through this opening, the whole of his stools were passed for nearly three weeks, when it completely closed, and the alvine matter resumed its natural course. The scrotum assumed a healthy granulating appearance, and had cicatrized fully two-thirds, when the symptoms of diseased heart, under which he laboured, became more urgent, and general dropsy took place. He died on the 5th January following.

On inspection, the inguinal openings, on both sides, readily admitted four fingers. Both sacs contained considerable portions of the small intestines, which were free of adhesions, and appeared to be healthy. It was hardly possible to ascertain that part of the gut in the left hernial tumour, in which the artificial anus had existed; it had contracted no adhesions to the sac, and had otherwise a natural appearance, except a small portion about the size of a sixpence, which was slightly thickened, irregular, and purple-coloured. On the right side of the scrotum, there were two distinct tumours which had no communication with each other; the upper one was the hernial sac, and the lower one was formed by a collection of fluid in the tunica vaginalis.

From whatever cause an artificial anus originates, the first step towards a cure uniformly consists of the adhesion of the bowel to the neighbouring parts. It was the absence of this which gave to the above case its chief peculiarity.

ON LITHOTOMY.

WITHOUT entering into a critical examination of the various plans which have been at different times adopted, for the removal of urinary concretions by surgical operation, I shall briefly state the mode of procedure adopted in the following cases:—A large curved staff, having a wide and deep groove on its convex side, was passed into the bladder, the patient was secured in the usual way, and an assistant appointed to fix the pelvis, by pressing against the iliac bones. A long narrow double-edged scalpel was then thrust into the perinæum, between the erector penis and accelerator urinæ, and its point carried steadily forward till it rested in the groove of the staff. The external incision was completed, by carrying the knife downwards and outwards between the tuberosity of the ischium and the anus, care being taken to depress the handle, and to elevate the point of the scalpel, so as to withdraw it from its deep position on passing the rectum. By this incision, the staff was always so fairly and completely exposed, that, on introducing the finger into the upper part of the wound, farther dissection was seldom required; the same scalpel was, therefore, run along the groove into the bladder, and the preliminary steps of the operation finished in a few seconds, by dividing the membranous part of the urethra and prostate gland in the usual direction.

The extraction of the stone is often the most difficult, and generally the most uncertain part of the operation; and on the care and caution with which this is performed, will the safety of the patient not unfrequently depend. When the calculus is of the usual size, when it is encysted, or grasped by spasmodic contraction of the bladder, the difficulties are greatly increased. The first three cases illustrate these points.

CASE XLVI.—*Calculus Vesicæ of unusual size successfully*

extracted.—J. T., æt. sixty, admitted 27th July, 1826. Had experienced pain and difficulty in voiding urine for more than five years. On examination, this was found to depend on the presence of a calculus. It was ascertained to be of a large size, in consequence of the dull, obtuse sound produced by striking it with a metallic instrument, the large space it occupied in the bladder, and its apparent weight and extent when examined per anum. Doubts were entertained as to the possibility of extracting it by the lateral operation. This was, however, ultimately decided on, as from the duration of the disease, and the consequently contracted and thickened state of the bladder, the high operation seemed impracticable.

On the 30th, the lateral operation was performed, and after a little difficulty, an oval-shaped calculus was extracted. It measured six and three-fourth inches in the transverse, and eight inches in the longitudinal circumference, and weighed six ounces and five drachms. The wound healed slowly, and he was dismissed on the 23d of October.

Besides the difficulty experienced in the extraction of so large a stone, it was found, that from rheumatic stiffness of the knees and hip-joints, it was impossible to separate the thighs above a few inches from each other, or to bend them upon the abdomen, so as to obtain the usual space for the external incisions.

Case XLVII.—*Lithotomy successful—Stone Encysted.*—J. R., æt. twenty-three, 28th September, 1827. Had laboured under symptoms of stone for twenty years. On introducing a sound, and moving it in various directions, no stone was discovered; but on passing it more deeply, and raising the point, a rough, irregular calculus was distinctly felt in the right side of the fundus. The instrument could be moved around what appeared to be a projecting portion of the stone, and from one irregular point to another. Varying the position of the body, produced no obvious change on the situation of the stone. The symptoms, except during two short periods, had never been so severe as to prevent him from following his trade, but were occasionally aggravated by violent exertion and intemperance. For the last two years he had been almost

free of painful symptoms, until ten days ago, when the present attack commenced, which has been the most violent. He was repeatedly sounded, and the stone uniformly discovered in the same situation. It was believed, that if the unusual position of this calculus depended on spasmodic contraction of the bladder, this might be overcome by distending this viscus by injection, the patient being unable to retain a sufficient quantity of urine for that purpose. Accordingly, ten ounces of tepid water were thrown into the bladder by Jukes' syringe, until a prominent tumour was felt above the pubes, but without causing the stone to assume a depending position. From the long continuance of the symptoms, the numerous and lengthened intervals of ease which he experienced, and the unusual situation of the stone, I had reason to believe that it was encysted. From the irritable state of the bladder, which was always obvious after sounding, it appeared improbable that a considerable sized, rough calculus could have remained so long loose in the cavity of this viscus, without producing more marked and violent symptoms. It was agreed in consultation, to perform the lateral, in preference to the high operation which was at one time contemplated. The stone was believed to be encysted; but as the point of the sound could be passed around a considerable portion, which appeared to project into the cavity of the bladder, it was expected that this might be laid hold of and extracted, although with some difficulty.

I operated on the 6th of October. After the prostate was divided, the stone could not be discovered by the finger; but, on introducing a pair of long forceps, and pushing them up to the right side of the fundus, as far as the handles would permit, it was firmly grasped, and brought down with ease to the edge of the divided prostate, evidently bringing the fundus of the bladder along with it, when the instrument slipped. This occurrence happened frequently, and the forceps had always to be introduced in the same direction, and to the same depth as at first; showing that the stone had not changed its position, and adding to the belief of its being encysted. This opinion was still farther confirmed, by retaining the calculus as near the wound as possible, by the forceps held in the left hand, while the right

fore finger was introduced by the side of the blades, and the calculus found to be firmly grasped by the bladder. The finger nail could be introduced between the edge of the cyst and the stone, round its whole circumference. To have employed much force in attempting to tear away the calculus, would have been dangerous,—the bladder might have been inverted, and separated from its neighbouring connexions. I therefore selected a pair of forceps with thin blades, introduced them to the necessary depth, carrying the handles well back towards the sacrum, laid hold of the stone, and, by a slow wriggling motion, moved them along its surface, with the view of insinuating their points between the border of the cyst and the stone. When this appeared to be accomplished, the handles were gradually separated in several directions, so as to produce dilatation, if possible, without lacerating the parts, and the stone was again grasped, and, with a little force, at length extracted. It was of the mulberry kind, and weighed one and a half ounces. The one side was smooth, whilst the opposite was nodulated; and, although there was no distinct neck, there was a deep groove traversing nearly two-thirds of its circumference, exactly where it was grasped by the bladder. But little blood was lost, and the patient bore the operation with great fortitude. An elastic tube was introduced through the wound into the bladder, and retained for thirty hours, after which the urine passed by the wound for three weeks, when it closed. He had no bad symptoms, and, about the middle of November, was again at his employment.

The difficulties were greater than had been anticipated, and might have arisen from one of these three causes:—Too small an opening into the bladder; temporary contraction of the bladder around the stone; or, from the stone having been encysted. That it did not depend on the first, I have no hesitation in affirming; for both external and internal incisions were free, and more than sufficient for the egress of a much larger stone. I am also convinced that the difficulty did not depend on spasmodic contraction, (an occurrence by no means uncommon,) but that it was firmly encysted. It is probable, that at an early period the irritation produced by a rough stone may have excited a temporary or spasmodic

contraction, which, by organic changes, became subsequently permanent.

Case XLVIII.—*Stone grasped by the Bladder—"Operation à deux temps"—Cure.*—A. P., æt. seventeen and a half. Had suffered severely from calculus for two years, before applying to me in the beginning of November, 1831. Micturition was extremely frequent and painful, but the stream of urine was never observed to stop suddenly. He had voided daily, for more than a year, a large quantity of calcarious matter, which, on being analyzed, was found to be composed of the phosphate of magnesia and ammonia. The lateral operation was performed on the 25th, and the stone found fixed above the pubes, on the right side. Having failed to dislodge it by one or two cautious attempts, and not being able to seize it with the forceps, I ordered the patient to bed, trusting that, in a few hours, the contraction of the bladder would cease, and the stone drop into a depending part, and be afterwards extracted. In five hours after the operation, I was hurriedly sent for, and found that his urine was completely obstructed. On removing a coagulum from the wound, and attempting to pass the finger into the bladder, I found a calculus, about the size of a walnut, sticking in the wound of the prostate, which was easily extracted by the forceps. In ten days, he had a severe attack of cynanche tonsillaris, which ended in suppuration; but the febrile excitement gradually abated, and the wound filled up, although slowly.

I have little doubt, had the efforts to extract the stone been either violent or long continued, that the result would have been different. The good effects of permitting the contraction of the bladder to subside, which generally takes place in a few hours, and of then removing the calculus, are well depicted in this case. In the three following cases, the prostate gland was enlarged, and otherwise diseased, yet the operation proved successful.

Case XLIX.—*Lithotomy—Enlarged Prostate—Six Calculi extracted—Cure.*—J. L., æt. sixty-three. Had laboured under symptoms of stone for three years, and voided, with his

urine, almost daily, small quantities of blood and sand. The prostate gland was as large as half an orange, but smooth and soft. He experienced severe pain and tenesmus on going to stool. I performed the lateral operation on the 4th of February, 1827. The calculi were lodged in a cavity behind the prostate; and, before they could be seized with the forceps, they had to be pushed back with the finger into the cavity of the bladder. They were six in number, each being about the size of a small marble. An elastic tube was introduced through the wound into the bladder, and retained for twenty-four hours. The parts gradually healed, and in a month he was cured.

Case L.—*Lithotomy—Enlarged Prostate—Troublesome Hemorrhage—Cure.*—W. W., æt. sixty-four, admitted 12th November, 1831. The symptoms had existed for six years, and had lately become so urgent as to prevent sleep, and produce considerable emaciation. The calls to void urine occurred every hour, and were accompanied by violent tenesmus and prolapsus ani. He had had repeated attacks of hemorrhage from the bladder. The prostate was enlarged, indurated and irregular, especially the left lobe; the bowels habitually costive, the tongue loaded, the thirst urgent, and the pulse accelerated.

After a few days preparatory treatment, the lateral operation was performed on the 18th, and a rough, oblong calculus extracted. It measured two and a fourth inches in length, one and a half inches in breadth, and weighed one ounce and one drachm. The transverse artery of the perinæum bled freely, and there was rather profuse venous hemorrhage on dividing the prostate, amounting in all to about eight ounces. This continued after he was put to bed, and produced a feeble pulse and a bleached countenance. An elastic tube was introduced, and the wound filled with sponge; but there still continued a good deal of oozing, and he had repeated threatenings of syncope for twelve hours. On the morning of the 19th, the sponge accidentally slipped from the wound, and the bleeding returned; it was therefore re-introduced, and retained till the evening of that day, after which time there was no farther hemorrhage. He had considerable febrile excite-

ment for several days, and nearly a fortnight elapsed before the wound began to granulate; it, however, completely closed, and he was dismissed in excellent health.

Case LI.—*Lithotomy—Prostate hard and tumid—Cure.*—R. C., æt. sixteen, admitted 28th December, 1826. The symptoms, which had existed more or less for six years, were urgent and well marked, and a stone was readily detected on the introduction of a sound. The prostate was hard, painful, and more than twice the natural size; he had pain in the situation of the left kidney, which followed the course of the ureter; the urine was loaded with mucous, and a soft calcarious matter, not unlike mortar. After the use of occasional purgatives, opiate enemata, the hip-bath, acids, &c., the irritability of the bladder was so considerably subdued, that I proceeded to perform the operation on the 12th of January. The calculus was rough, but rather soft, and weighed nearly one and a half ounces. A large elastic tube was retained in the bladder for thirty hours; the greater part of the urine continued to escape by the wound for ten days, when it gradually healed, and he was dismissed, cured, towards the end of January.

I think favourably of the practice of introducing a tube into the bladder, and retaining it till the tract of the wound be consolidated. We shall thus obviate the risk of urinary extravasation, prevent premature cohesion of the sides of the wound, or closure of it by clots of blood, and facilitate the regular discharge of the urine. In the last case, but for the use of a tube, the escape of urine would have been prevented, the wound having been closed by the great protrusion of fat which took place in the course of the external incision. This practice will be found to prevent the wound, both in the bladder and externally, from adhering by the first intention, an occurrence which I have met with in two cases. It is not, however, desirable, nor indeed is it safe, to favour this premature closure of the wound; by which means the passage of the urine along the penis becomes for some days both painful and difficult, giving rise to local irritation and constitutional excitement, as well as to the danger of extravasation. When the tube has not

been introduced, and the urine for some hours after the operation appears to be discharged with difficulty, I do not hesitate to pass the finger through the wound into the bladder, and thus to destroy any adhesions that may exist. I have seen three cases, in which, by a neglect of this simple procedure, extravasation of urine into the cellular texture of the pelvis was produced, giving rise to fatal peritonitis. One of these, which occurred to myself, I shall now detail:—

Case LII.—*Lithotomy fatal from Urinary Extravasation and Peritonitis.*—G. G., æt. eighteen, admitted on the 11th December, 1826. The symptoms had existed for two years, and were more than usually severe. The calls to micturition were frequent, and exceedingly painful, and the urine was loaded with a whitish flaky sediment. A small calculus was detected by the sound, apparently in the right side of the bladder. The pain which these examinations produced, even when the utmost caution was employed, was most excruciating, and showed the bladder to be highly irritable. After soothing treatment for several days, the operation was performed on the 17th, and a small, very rough mulberry calculus extracted, which weighed about sixty-five grains. In the evening, he began to complain of pain in the wound; the pulse was quick and irritable; he had cough, and an uneasy feeling in the hypogastrium, with a desire to void urine, which he had not been able to accomplish. The adhesions were separated by the finger, and about four ounces of urine discharged.

18th.—Was restless during the night, and unable to pass urine, either by the wound or penis, till this morning; but since then, it has flowed freely through the wound. Had a slight rigor; there is swelling above pubes, without pain or pressure; countenance anxious; pulse one hundred and twenty-eight, rather indistinct; tongue thickly furred; thirst urgent. The finger was passed into the bladder, but no coagulum found in it.—*Sum. Ol. Ricini, dr.* vi. *et post hor. duas Enema domestic.* In the evening, he complained of increased pain above pubes and in wound; and there was a small spot in left inguinal region, where the slightest pressure was intolerable. Pulse one hundred and twenty-six; breathing

hurried; no stool.—*Applic. Hirudin.* xxiv. *hypogastrio, et postea fotus—R. Submur. Hydrarg. gr.* vi. *Pulv. Rhei gr.* xx. *M. sit pulv. st. sumend.—Baln. tepid.*

19th.—Was bled at one, A. M., and syncope induced by the loss of fourteen ounces; the blood was neither cupped nor buffy. Lower half of abdomen swollen, and painful on pressure; countenance collapsed, and more anxious; had a free loose stool, from an infusion of salts and senna; pulse one hundred and forty, small and indistinct; tongue thickly covered with a brown fur.—*Hirudin.* xxiv. *abdom.—Capt. q. p. Submur. Hydr. Pulv. Antim. aa. gr.* v. *M. et si opus sit Reptr. Infus. Sennæ c. Sulph. Magnes.*

Although it was evident that peritonitis had begun, and was extending rapidly, yet the collapsed countenance, the feeble and fluttering pulse, and the typhoid character of the symptoms, contra-indicated the use of the lancet. I have more than once seen this practice carried to an injurious extent, after the operation of lithotomy. This will not appear surprising, when we know that, in many of the cases, the fatal result is occasioned by urinary extravasation, to which the peritoneal inflammation is only secondary. The high constitutional excitement which invariably accompanies the escape of urine into the cellular texture of the pelvis, soon tells on the nervous system, and produces such a marked state of typhoid depression, as to render general blood-letting, even when peritonitis exists, a very doubtful remedy.

Seven o'clock, P. M.—Belly less painful; swelling rather diminished; pulse more distinct, but can hardly be counted; heat of skin natural; no vomiting or hiccup; one loose stool; urine escaping freely by wound.—*Admov. abdom. Emplast. Vesicat. et Capt. 4ta. q. q. hor. Submur. Hydr. gr. iij. Opii gr.* i. *in form. pil.*

20th.—Appears more cheerful, and says he feels relieved; countenance hypocratic; pulse feeble and intermittent; abdomen more swollen, and tympanitic. During the day, the urgent symptoms increased rapidly; vomiting and hiccup supervened, and he died at midnight,—about eighty-three hours after the operation.

22d.—*Dissection.*—Bowels were distended with air, and

there existed a few patches of inflammation on the peritoneal covering of the ileon. There were about four ounces of sero-purulent fluid effused into the pelvis; but the traces of peritoneal inflammation were here very slight and obscure. The cellular texture, surrounding the bladder, especially on its anterior surface, and that covering the left psoas muscle, was broken down, and loaded with pus and urine. The bladder was thickened, and its mucous coat highly inflamed, ecchymosed, and, in some places, ulcerated.

From the symptoms during life, as well as from the *post mortem* examination, it was evident that the accidental closure of the wound, during the night succeeding the operation, had prevented the escape of the urine, caused it to accumulate in the tract of the incision, and become diffused through the loose cellular texture of the pelvis, which occurrence, besides the usual constitutional symptoms, had also excited peritonitis. This combination is not, however, always to be met with. I have witnessed the inspection of four cases in which urinary infiltration occurred, and proved fatal, without there being any perceptible trace of peritonitis.

In the next case the fatal result could not be attributed to the operation, but to the existence of a large bony tumour in the mesentery.

Case LIII.—*Lithotomy fatal from obstructed Bowels, produced by the pressure of an Osseous Tumour in the Mesentery.*—R. C., æt. sixty-seven, admitted on the 23d January, 1827.* Complained of severe pain about the neck of the bladder, and at the glans penis, coming on frequently when at rest, and without evident cause, but always urgent during micturition, when at stool, or on the slightest motion of the body. The calls to void urine varied in frequency. For whole days he required to pass it every quarter of an hour, generally in a small stream, frequently obstructed, and accompanied by painful tenesmus. Had slight pain on pressure in the situation of

* Glasgow Medical Journal, vol. i. p. 304.

the right kidney, and had several times voided small calcarious particles about the size of a pin head, and, twelve months before, a hard smooth yellow stone, of the size and shape of a kidney bean. A large sound was readily introduced into the bladder; and, from the irregular feeling and rattling noise communicated, it was evident that there were several calculi. The urine was of a natural colour, but, on standing, it deposited a small quantity of flaky sediment. The bowels were obstinately costive, and the abdomen somewhat tympanitic. These symptoms, commencing about nineteen months before his admission, and gradually increasing for the last six weeks, had forced him to give up his employment.

On attentively examining this patient, to ascertain if any other disease existed likely to militate against the success of an operation, it was found that, with the exception of a slightly enlarged prostate, and flatulent distention of the bowels, no other morbid manifestation could be discovered; and these were not such as to forbid an operation, to which he was anxious to submit. Although advanced in years, he still exhibited a healthy and robust appearance, and possessed sufficient vigour to sustain the shock of an operation, and afterwards to establish an efficient process of renovation. The straining on going to stool, and while micturating, was excessively severe, and resembled much the propulsive pains of parturition; but it was believed that the obstinate constipation, and the irritation from the calculi and enlarged prostate, were sufficient to account for this unusually urgent symptom. The prostate gland had not the globular shape usually observed; it was, however, somewhat enlarged, firmer than natural, and so flattened, that the finger could not reach the bladder. When this part is in a state of simple chronic enlargement, we cannot reasonably refuse our patients the chance of an operation, should there exist no other unfavourable combination. I have several times operated with success in more extensive enlargements of the prostate; and although the wound did not heal so speedily as when no such disease existed, the result was still sufficiently fortunate to justify the operation, and in one of the cases the gland diminished considerably afterwards. The existence of several calculi in the bladder, would,

by requiring the frequent introduction of the forceps for their removal, somewhat protract the operation; but this could afford no ground of apprehension, it being acknowledged that there is more danger to be dreaded from the extraction of one large, than of many small calculi.

The patient was subjected to the usual treatment for a few days. He was repeatedly purged with castor oil and enemata, and an immense quantity of scybala evacuated, but without any marked reduction of the flatulent distention of the belly; the bladder was soothed by the warm bath, anodyne clysters, and frequent doses of supercarbonas sodæ.

On the 29th, the lateral operation was performed, by running the narrow probe-pointed knife along the groove of the curved staff, and six entire, and three broken calculi extracted; the largest being oval, and about the size of a walnut. From the enlargement of the prostate, and depth of the perinæum, some difficulty was experienced in feeling with the finger the whole internal surface of the bladder, to ascertain that all the calculi were extracted. To remove all doubts in such cases, the introduction of a sound, either by the penis or the wound, should not be neglected, as it affords the most correct means of ascertaining that this necessary object has been effected. The prostate gland felt hard, almost like cartilage; but when the finger or forceps were withdrawn, it still retained so much elasticity, as to close the wound into the bladder as if by a valve. Three arteries were observed to bleed freely, two superficial branches were tied, and a large deeper-seated vessel, evidently the transversalis perinæi, threw out its blood per saltum, and in considerable quantity. This artery was much enlarged, but from its deep situation, and its being divided near to the ramus of the ischium, it was found impossible to secure it by ligature; it was, however, easily commanded by pressure. An elastic tube was introduced into the bladder; the patient was placed on his back in bed; the thighs separated, to facilitate the escape of blood; and he was lightly covered, and kept cool. On visiting him at eight, P. M., the urine was passing freely along the tube, and he was free of pain, except when occasionally attacked by a strong bearing-down sensation, accompanied with a desire to void urine and go to stool, which,

being similar to what he experienced before the operation, was ascribed to flatus. The finger was passed into the bladder, which was found empty. Pulse seventy-two, soft; complained of thirst, and slight rigors.—*Anodyne enema.*

30th.—Has had some sleep during the night, and feels easy, except when affected at intervals with severe spasmodic pains in the abdomen. In the evening, as he had pain on pressure above the pubes, and his pulse was accelerated, twenty-four leeches were applied to the hypogastrium, and a large enema ordered, which dislodged a quantity of hardened fæces.

31st.—Continues to complain of violent expulsive efforts, and of fixed pain above the pubes. Pulse seventy-four, tongue clean, no stool. The tube was withdrawn.—*Castor oil—Leeches to the hypogastrium—Anodyne enema at bed-time.*

1st February.—Six stools from the oil, but continues to complain of fixed pain in the hypogastrium, and of general uneasiness in the abdomen from flatulence. Leeches and anodyne repeated. A large elastic tube was introduced for several inches into the rectum, to facilitate the escape of air from the bowels, but only a small quantity was discharged. This practice is sometimes successfully adopted, when the natural peristaltic action of the intestines has been impaired by flatulent distention; but if the gas is confined in the small, or high up in the large, intestines, beyond the reach of the tube, no benefit can be expected from its introduction.

2d.—Passed a comfortable night; but an hour before the visit had a smart rigor, followed by increase of pain, thirst, and nausea. Pulse eighty-four, small and sharp; tongue dry and furred.—*Calomel and opium—Fomentations—V. S. to xij. ounces.* Blood cupped and buffy.

3d.—Pain on pressure, swelling, and tenesmus greatly abated. Voids his urine through the wound at intervals, by contraction of the bladder. Pulse seventy-two, soft and compressible.

5th.—Flatulence and tenesmus increased, coming on in frequent and violent paroxysms, but with little or no pain on pressure. Has had several stools, containing scybala, accompanied with excruciating pain during their evacuation. Complains of the feeling of a large hard body, fixed in the upper

part of the rectum, which excites violent expulsive efforts. Pulse seventy, rather weak; tongue dry and furred; wound sloughy.—*Dose of castor oil, and anodyne enema after its operation.* These symptoms appeared to depend on abdominal irritation, the consequence of an impacted state of the colon; but did this condition of the bowels afford an adequate explanation of the violent bearing-down efforts, which had annoyed him more or less for a whole year?

From this report till the 10th, there was little change in the symptoms. The spasmodic pains affected him violently, and the wound was lined with an ash-grey tenacious secretion. The stools still contained scybala; his countenance was pale, and had an exhausted expression; on which account purgatives were more sparingly administered, and the bowels unloaded by frequent and copious injections, thrown freely up by the patent enema syringe.

13th.—Paroxysms of pain continue unabated, but the stools are now of a natural colour and consistence. Pulse sixty-eight.—*Anodyne enema—Beef tea—Arrow root.*

15th.—Had a violent attack of pain this morning, chiefly referred to the rectum; and he describes it as exactly similar to what he experienced on going to stool previous to the operation. The finger was passed into the rectum, but neither hardened feces, nor any other obstruction was discovered. As the bowels were now acting more freely, and the flatulence had diminished, and as he complained of burning heat about the prostate and bladder, it was judged proper to soothe the recto-vesical irritation by a pill every six hours, containing *Extract. Hyosciami, gr. iij. and Camphor, gr. ij.—Warm bath—Anodyne enemata—An occasional opium suppository.*

For the following three days, the attacks of pain were less violent, and he appeared to improve in strength and spirits; he still, however, complained of severe straining at stool, from the feeling of a foreign body in the gut, which he was ineffectually excited to expel. On the 20th, his appearance was less languid; his pulse was about eighty, and of moderate strength; the tongue clean and moist, and the wound florid and granulating. The thighs were secured together to accelerate its closure, and the urine passed afterwards by the

penis. His appetite was improving; and, although at this period he was considerably exhausted, there existed no prominent indication of a suddenly fatal result. On the morning of the 22d, he was seen by the nurse, at six o'clock, in his usual state; and when visited again at eight, he was found dead in bed.

Dissection.—On opening the abdomen, a hard tumour was discovered lying over the last lumbar vertebra, between the laminæ of the mesentery, near the inferior part of the ileon, and which pressed on the sigmoid flexure of the colon, where it is about to become rectum. The surrounding mesentery exhibited no thickened or diseased appearance, and only adhered to the surface of the tumour by loose cellular attachments, easily destroyed by the finger. It was about the size of a small lemon, of a hard bony feel and appearance, and a very irregular shape. When sawn through, the exterior part was evidently bone, and varied in thickness, at different parts, from a quarter to half an inch, whilst the centre was filled by a yellowish-white substance, in appearance and consistence like adipocire, intersected in various directions by spiculæ of bone. Two small cavities in the centre were lined with innumerable transparent, needle-like crystals, which, however, disappeared after the tumour was dried, and before I had an opportunity of submitting them to chemical analysis. The mucous coat of the bladder was considerably thickened, of a dark vascular-plaited appearance, especially about the neck, and coated by a muco-purulent secretion. There was a tumour at the fundus about the size of a small marble, containing purulent matter, which issued into the cavity of the bladder, through two fistulous openings in the mucous coat at that part. The prostate gland was enlarged, and firmer in texture than natural, but without the fibrous appearance of scirrhus. The mucous coat of the rectum was highly inflamed, and there was considerable induration and thickening of parts between this gut and the base of the bladder.

This dissection afforded a satisfactory explanation of what had been previously only matter of speculation. The long-continued and painful tenesmus was obviously to be referred to the pressure of the osseous tumour, on the commencement

of the rectum, producing an impediment to the regular discharge of the feces, tympanitic swelling of the abdomen, and great irritation. From the situation and connexions of this tumour, it would appear, that when the diaphragm and abdominal muscles were called into action in expelling the feces, it would be forced back on the termination of the colon, by the pressure of the surrounding parts, and not only impede the feculent evacuations, but also, from its extreme hardness and inequality, irritate and injure the bowel in no small degree.

In scrofulous habits, the mesenteric glands are sometimes filled with calcarious matter; but bony depositions are stated by Dr. Baillie, (Morbid Anatomy, p. 134,) to be of rare occurrence. The few recorded cases of this disorganization, which I have had an opportunity of examining, appear to have originated in disease of the glands of the mesentery, and to have been complicated with organic disease of the bowels. Dr. Donald Monro narrates a case in the Medical Transactions, (vol. ii. p. 361,) in which all the mesenteric glands, varying in size from a pea to a walnut, were hardened and ossified. They were not, however, as in the case above detailed, made up of one large firm osseous tumour, but, "like spongy carious bones, they were composed of a number of small pieces, joined together by membranes."

This patient's death cannot be attributed to the operation: he lived for twenty-three days after its performance; and although the bladder was partially diseased, yet he was exhausted and carried off by an unusual and unexpected occurrence. It was a combination that could not have been detected during life, otherwise no operation would have been performed; and, although it had been discovered, it was irremediable. The flatulent distention of the belly, of course, prevented its being recognized by any external examination, and it was too high up to be reached by the finger in the rectum.

I am indebted to Professor Thomson for the following analysis of the calculi and tumour:—

The calculi consist chiefly of uric acid. But there is present in them also, a small quantity of matter, which has a light yellow colour, and dissolves with ease, both in nitric acid and in caustic potash. But it did not crystallize with either, nor

form the pink-coloured matter with nitric acid. It may be new; but the quantity upon which I experimented did not admit any farther trials. The bone is very solid externally, and is surrounded by a periosteum in the usual manner. It becomes more and more porous towards the centre. The specific gravity of the whole mass is 1.219. But it was so full of cavities, that this specific gravity is doubtless below the truth. The matter in the middle of the bone is soft, but compact. It cuts like cheese, and is partly buff-coloured, partly white. It was not in the least soluble in boiling alcohol, and therefore was not adipocire. It was insoluble in ascetic and muriatic acids, and therefore was neither muscular nor ligament. But when digested in caustic potash, a little fat was separated. It melted when heated, and behaved like cartilage.

Case LIV.—*Lithotomy—Extensive disease of the Prostate Gland and Bladder—Death eight weeks after the Operation.*—J. N., æt. sixty-eight, admitted January 18th, 1832. Has suffered for several years past from disease of the prostate and bladder; and, during the last three years and a half, he has laboured under retention of urine, which has required the introduction of the catheter nearly every second hour during the whole of that period. His calls to void urine are always accompanied by a prolapsus of the rectum, which he is obliged to replace before the catheter can be introduced, and by paroxysms of excruciating pain extending along the penis to the glans. The urine contains a copious whitish-coloured sediment, and occasionally small coagula of blood. On introducing a sound, a calculus is detected. Bowels costive; sleeps ill; tongue loaded; pulse natural; general health considerably impaired.

The diseased state of the prostate, which gland was hard, irregular, and about the size of half an orange, was the first unfavourable symptom which attracted attention. The next was the apparently diseased condition of the bladder, as indicated by the urine. This fluid was decidedly alkaline, and was loaded with a muco-purulent secretion, in which, on standing, small masses of calcarious matter, not unlike mortar, were

observed. The long-continued retention of urine was another decidedly unfavourable symptom, and appeared to depend either on the diseased bladder or the enlarged prostate. It sometimes happens, when the mucous membrane of the bladder has been long the seat of chronic disease, that the other tunics of that viscus become gradually involved in the same morbid action. The parts become thickened; a deposition of fibrine takes place into the cellular texture, by which the different coats are united together; and the contractility of the organ becomes greatly impaired, if not altogether destroyed. This morbid state of the bladder is generally combined with, and often preceded by, an affection of the prostate; on which latter occurrence the impediment to the excretion of the urine more frequently depends. In the above case, I stated to the students, before the operation was had recourse to, that as a catheter of large size could be readily passed into the bladder, it was probable that the middle lobe of the prostate was so much enlarged as to project into the bladder, cover the vesical orifice of the urethra like a valve, and thus prevent the egress of the urine. This opinion was found to be correct, on examining the interior of the bladder with the finger during the operation, and on the inspection of the parts after the patient's death.

After the use of acids, frequent doses of the Oleum Ricini, the hip-bath, anodyne enemata, &c., by which the bowels were unloaded, and the appearance of the urine greatly improved, I was reluctantly induced, by the earnest entreaties of the patient, who was suffering most acutely from the disease, and by the recommendation of a consultation, to try the chance of an operation. This was accordingly performed on the 5th of February, and a rough calculus, about the size of a walnut, extracted. He bore the operation, which lasted about a minute, with remarkable firmness, and not more than six ounces of blood were lost. Before he was removed from the table, a large gum elastic tube was introduced through the wound into the bladder. He continued to improve steadily from the third day after the operation. The elastic tube was withdrawn every fourth day, when its extremity was usually coated with calcarious matter, and its cavity filled with viscid mucus. It

was near the end of February before I could pass a catheter along the penis into the bladder. This was also removed every third or fourth day, cleaned and re-introduced,—it being thought more likely to hasten the closure of the wound, by retaining the catheter in the bladder for several days at a time, than by introducing it every two or three hours, when the urine required to be drawn off. On the 25th of March, the wound was nearly closed; he had no pain; his bowels were kept regular by medicine; his appetite was good; he had improved decidedly in flesh and strength; and his general health was better than it had been for many years. He was, in fact, considered to be out of all danger from the operation; and the symptoms of diseased bladder were much less troublesome than could have been expected. On the following day, (the 26th,) he complained of slight pain in the anus, which became prolapsed. On the 28th, as the urine was turbid, and contained a thick chalky sediment, the catheter was withdrawn, and introduced only when he felt inclined to empty his bladder. There was some febrile excitement; the pulse was about a hundred; the tongue dry and furred, and the bowels loose. He complained of pain and confusion of head; and his eyes were suffused. These symptoms increased; vomiting, hiccup, delirium, and subultus tendinum supervened. His tongue and teeth were covered with sordes; and, altogether, his appearance resembled that of a person labouring under typhus gravior. He died comatose, at the hour of visit, on the 3d of April,—eight weeks and two days having elapsed from the time of the operation.

The body was inspected on the 4th, and the following morbid appearances discovered. The bladder was greatly thickened, contracted, and indurated; its mucous coat was covered with a dark-coloured muco-purulent secretion, and in one or two places it was slightly ulcerated: the rugæ were in some places so deep, as to produce the appearance of small sacculi. All the lobes of the prostate gland were enlarged, and of a hard, almost cartilaginous texture: the middle one, which projected into the bladder, was of a pyriform shape, and completely covered the orifice of the urethra: on its apex there was a small patch of superficial ulceration. The right

kidney contained a cyst, the size of a pigeon's egg, which was filled with a straw-coloured fluid, like urine. It was seated in the cortical substance of the gland, but did not communicate with its pelvis. The inferior half of this kidney was soft and disorganized. The left kidney was small, and its natural structure completely changed. It contained a number of hard, greyish-coloured tubercles, as also pus and small calcarious particles. The rectum, immediately within the sphincter, was surrounded by a large indurated ring of hemorrhoidal tumours of a deep purple colour.

It is sufficiently obvious, that the death of this old man was not occasioned by the operation. By the removal of the calculus from the cavity of the irritable and ulcerated bladder, the urgent symptoms which previously existed were for a time decidedly relieved. In the majority of cases, however, it will be found, that when such extensive disease of the bladder is present, an operation, instead of doing good, will aggravate all the symptoms, and hasten the patient's death. It was a knowledge of this fact which made me hesitate so long before having recourse to the knife; and, as I have already stated, I was only induced to hazard an operation in such hopeless circumstances, by witnessing the dreadful suffering occasioned by the disease.

The febrile excitement which preceded death, and appeared to terminate in effusion on the brain, was probably caused by the disease of the bladder. The increase of the local symptoms was, however, so slight, and the appearance of any recent inflammation in the bladder so obscure, as to render this opinion somewhat doubtful.

In children, this operation is rarely fatal.

LV.—*Lithotomy on a Child—Cure.*—A. W., two years and eleven months old, had laboured under symptoms of stone for eight months previously to the 22d October, 1830, when he was placed under my care. He was in robust health, although the symptoms were severe, and accompanied by urgent tenesmus and prolapsus ani. On introducing a sound, a very small calculus was detected.

On the 24th, the lateral operation was performed, and a

brown-coloured rough calculus, about the size of an almond, extracted. Four hours after, he voided his urine by the wound, for the first and last time. Next morning, it passed along the penis, and continued to do so ever after. For several days he strained violently when expelling it, but this gradually subsided, and in fourteen days the wound was closed.

Case LVI.—*Lithotomy on a Child—Operation followed by Small-Pox—Cure.*—J. M'G., a fine healthy boy, two and a half years old, was sounded on the 23d December, 1830, and a small stone with difficulty detected. The symptoms commenced five months previously, and were becoming daily more severe. On the 25th, a calculus was extracted by the lateral operation; it was so small as to elude the forceps, but was easily turned out by introducing a finger into the bladder, and another of the opposite hand into the rectum.

On the 7th of January he was running about the house, and passing his urine by the penis, when he was seized with smart febrile symptoms; and, on the 9th, the surface of his body was covered with a plentiful eruption of small-pox. The fever continued moderate; and, upon the whole, the disease was mild. The child had not been vaccinated.

Case LVII.—*Lithotomy on a Child—Cure.*—R. F., æt. four and one-fourth years, admitted August 14th, 1831. In March last, was observed to scream on voiding his urine, which was passed frequently, and in small quantities. During the last two months, the symptoms had been much aggravated, and accompanied by impaired health and strength, defective appetite, and restless nights. On introducing a sound, a stone was readily detected. The instrument was made to strike on it, and produce a distinct sound; a circumstance which, from the small size of the calculus in children, is seldom observed. It affords, however, when present, the most convincing and unequivocal evidence of the disease.

On the 18th, a calculus, about the size and shape of a tamarind-stone, was extracted by the lateral operation. In the evening, as he had passed no urine, either by the penis or wound, and as there was a degree of circumscribed fulness

in the hypogastrium, I introduced the finger into the bladder, and emptied it. On the 28th, all the urine was observed to pass by the penis. He was dismissed, cured, on the 6th September.

In the following case, the complicated and extensive disease under which the child laboured, rendered the propriety of an operation extremely doubtful. It was, however, performed, and proved successful.

Case LVIII.—*Lithotomy successfully performed on a sickly and diseased Child.*—J. M'T., æt. three and one half years, admitted January 21st, 1832. Was observed to labour under a difficulty in voiding his urine when nine months old, soon after he had recovered from small-pox, hooping-cough, and measles. Micturition became frequent and painful, and the urine dark and turbid. He passed, at different times, eight small calculi, about the size of coriander seeds. The abdomen was swollen and tense; the body was much emaciated; and he had been subject to diarrhœa for eight months, with prolapsus of the rectum, to the extent of six inches. He had cough, urgent thirst, voracious appetite, and clammy sweats; pulse one hundred and twenty, soft; tongue clean and florid. A calculus of considerable size was detected on the introduction of a sound.

This child, from his diminutive size, did not appear to be older than eighteen or twenty months. He was emaciated, and had a sallow unhealthy appearance. He could not walk, nor even stand, without support; the eyes were dull and sunk; the pupils dilated and torpid; the stools whitish-coloured, and the habit decidedly scrofulous: besides the symptoms of tabes mesenterica, which were strongly marked, the fact of the child having passed several small calculi, seemed to strengthen the opinion, that they were formed in the kidneys, and that there was present a constitutional tendency to the disease. It is not possible to ascertain in children whether the calculus in the bladder has originated in that viscus or in the kidney. Should the child be in bad health, or have repeatedly voided small concretions, it is probable that the

kidneys are affected; by which means, the chances of success from lithotomy will be materially diminished. Even in these circumstances, however, the calculus may be extracted from the bladder, and the wound healed; but unless the morbid condition, upon which the disease depends, be removed, new calculi will be speedily formed. This occurred in a scrofulous child, whose body I inspected several years ago. About a year before its death, lithotomy had been performed; but, in a short time afterwards, the disease returned, and proved fatal. Several calculi were found in the bladder, which had evidently passed along the ureter from the left kidney, where a considerable number more were accumulated.

In the last case, the state of the child, on admission, was such as most decidedly to forbid the operation; it was therefore put under a suitable dietetic, and medicinal treatment, for several weeks, by which the diarrhœa was diminished, and the appearance of the stools improved. He became more lively, and could walk with a little assistance; but the abdominal swelling was not lessened, nor did the urgency of the urinary symptoms abate. On the 16th of February he passed three small calculi, which were composed of the phosphate of lime. Soon after this, the improvement which had been gradually going on appeared to terminate, it being evident that the stone in the bladder was productive of painful and injurious irritation.

On the 4th of March, I performed the lateral operation, and extracted three smooth, flattened calculi,—the whole being larger than a pigeon's egg: they were firmly grasped by the bladder above the pubes, but were removed, one by one, without any difficulty. During the operation, the gut was prolapsed, and was held aside by the left hand till the operation was completed. Not more than three ounces of blood were lost; yet, apparently in consequence of the shock to the nervous system, the countenance became more than usually pale; the lips were blanched; the eyes projected considerably, and were turned up; and the pupils became widely dilated, and insensible to the stimulus of light. This child recovered rapidly; the wound was closed in less than three weeks, and

the health appeared to be improving, when he was dismissed on the 1st of April.

It is hardly possible to meet with a case more unfavourable for operation than the one now detailed. I believe that all those surgeons who are ambitious to acquire and maintain a reputation as successful lithotomists, and who are careful in selecting their patients, would have declined operating on this case, as well as on some of the others already narrated. I am not satisfied, however, that any surgeon, from a morbid anxiety about his own reputation, and a wish to be able to exhibit a long list of successful cures, is justifiable in denying to the diseased, even in doubtful and unfavourable cases, that professional assistance which both humanity and science claim at his hands. I am by no means an advocate for the knife, unless there is a prospect of its being successfully employed; nevertheless, when it is the only means we possess of prolonging existence,—why, even when the prospect is not inviting, should any selfish feelings prevent us from having recourse to it?

When the bladder contains one or more small calculi, we are advised, by Sir A. Cooper, to extract them by means of the urethral forceps, which he has frequently done, without loss of blood, or danger to the patient. He does not appear to have attempted this operation in children; on the contrary, he states, that "it will be extremely difficult to contrive an instrument of sufficient delicacy, to be introduced into the bladder of a child through the urethra, which shall possess such a degree of strength as to enable it to grasp the stone firmly, and to extract it with safety."* This practice was, however, adopted in the following case:—

CASE LIX.—*Calculus in the Bladder of a Child extracted by Weiss's Catheter Forceps—Slight injury of the Urethra, giving rise to Extravasation of Urine—Cure.*—W. A., aged seven years,

* Lectures by Tyrell, vol. ii. p. 276.

admitted October 17th, 1831. Has had constant pain and difficulty in voiding urine for more than six months; and two days ago, complete retention took place, giving rise to violent straining and swelling of the abdomen. A calculus was detected by a sound in the urethra, about one-fourth of an inch within the posterior boundary of the scrotum, where a small, circumscribed, and painful swelling was felt externally.

On inquiry, I found that various attempts had been made by a surgeon to hook the calculus with a probe, and to favour its escape by dilating the anterior part of the canal with bougies, &c. The necessity for prompt interference was rendered obvious by the following considerations:—1st. The bladder, in consequence of complete obstruction, was so distended with urine, as to form a large pyriform tumour, which was seen and felt to reach above the umbilicus. The urine had been retained for forty-eight hours; and there existed, along with tenderness of the abdomen on pressure, such a degree of constitutional excitement, as to show that farther delay would be productive of dangerous consequences. 2d. The state of the urethra was also such as to call for immediate interference. That portion of the canal in which the calculus was fixed, was already inflamed, tumid, and painful; there was therefore a risk of it ulcerating, and extravasation taking place. I have seen one case of this description, which had nearly proved fatal; and Sir A. Cooper has twice known calculi in the urethra destroy life by this dangerous and destructive occurrence.

Before attempting to grasp the stone with Weiss's catheter forceps, or to push it back behind the edge of the scrotum, and cut down upon it, I passed a steel sound along the urethra, to ascertain its exact situation. I then found that it was dislodged from its former position, and had passed back as far as the bulb,—probably by the pressure of the boy's fingers during the painful attempts at micturition. From the dilated state of the canal posteriorly, the sound was easily introduced into the bladder, pushing the stone before it. Although the urethra was now freed of its irritating cause, and there no longer existed an impediment to the discharge of the urine, yet I regretted that the stone was again lodged in the bladder, in as much as the operation of lithotomy, which might be re-

quired for its removal, was a more serious procedure than cutting down upon it in the urethra. It appeared, however, that the parts were in a favourable state for attempting to seize the stone, which was evidently of small size, and to extract it through the urethra. I therefore passed, with ease, into the bladder, a pair of catheter forceps intended for an adult; and on opening their blades, gave exit to a stream of urine, which, from the small size of the catheter portion of the instrument, continued to flow for a considerable time before the distended bladder was perceptibly reduced. After moving about the expanded instrument in the bladder, I could not ascertain whether the stone was laid hold of or not, until I had partially withdrawn it. It passed freely out as far as the posterior edge of the scrotum, when its progress was arrested. I then discovered, by external examination, that the calculus was between the blades of the forceps, which were separated nearly one-fourth of an inch. As the narrowest part of the canal was still to be passed, I considered that the removal of the stone by an incision in the perinæum would be the safest practice. I found, however, on again attempting to withdraw the instrument, that the resistance was comparatively trifling; and as the calculus, so far as could be ascertained by external examination, was fairly embraced, and even covered by the blades of the forceps, I determined to continue slowly and cautiously to extract it. There was some difficulty experienced about the centre of the scrotum, and at the orifice of the urethra; but this was gradually overcome without force, and a stone, broken into fragments, was extracted. The patient complained but little of pain, and not more than three or four drops of blood were lost.

From the caution employed, I did not expect that any injury had been done to the urethra; but by way of precaution, I ordered the introduction of an elastic catheter, so soon as the patient was placed in bed. The house-surgeon failed in passing the instrument; and when I saw this boy again at twelve o'clock, P. M., I found that he had voided only a small quantity of urine by the penis, and that three or four hours before my visit, swelling of the scrotum had commenced. It was indeed evident that the urethra had been lacerated in

the extraction of the calculus, and that urinary extravasation had been produced. I therefore passed rather a full-sized catheter into the bladder, and retained it there to favour the escape of the urine, and to diminish the risk of farther extravasation, and several scarifications were made into the tumid parts of the scrotum and penis, to which warm fomentations were applied.

On the 18th, the swelling and dusky redness had increased, and extended over the pubes, but not to the perinæum. Pulse one hundred and thirty-two, sharp; tongue furred; face flushed; skin covered with perspiration. A few more scarifications were made, and a smart purgative ordered.

20th.—Swelling of scrotum rather diminished; integuments of a dark red colour; inflammation has extended over pubes, as far upon abdomen as superior spine of ilium; but here there is little swelling, and no tension. Urine passed freely along catheter into a bladder attached to its extremity.

21st.—Since morning, catheter has been obstructed, and urine has escaped by its side; no farther extravasation; affected parts are still tumid and inflamed, and scarifications have a greyish, sloughy appearance. The catheter was removed, cleaned, and again introduced without difficulty.

On the 23d, he had an attack of convulsions, which, however, did not recur; and on the following day a small stream of urine was observed to issue from an ulcerated opening in the dorsum of the penis, close to the pubes. In a few days the scarifications had cicatrized, and the fistula speedily closed. On the 12th of November he was dismissed, cured.

When the calculus is small, whether the disease occurs in a child or an adult, I would prefer attempting its extraction by the urethra, to the painful and hazardous operation of lithotomy. When it is too large to pass along the whole canal, it may be brought into the perinæum, cut down upon and extracted. For this purpose, that ingenious instrument, the catheter forceps, invented by Mr. Brodie, and recommended in his valuable Lectures on "Calculous Disorders," as published in the Medical Gazette, is preferable to the one employed by Sir A. Cooper. It is, however, liable to several objections; the most important of which, are the small size of the catheter part of

the instrument, and the impossibility of ascertaining when the stone has been laid hold of. Mr. Brodie, in the only case in which he employed this instrument, states, that when the bladder was empty, he endeavoured to close the forceps, but found that he could not do it, the stone being seized. I have only to add, that in the instrument belonging to this Infirmary, which was made by Weiss, it is impossible, when it is in the bladder, to ascertain whether a calculus is between its blades or not.

The operation of dilating the urethra in the female, has now, in a great measure, superseded the use of cutting instruments. By Weiss's dilator, large calculi may be extracted with ease and safety. Even in young subjects, the operation may be safely and successfully adopted, without any bad consequences resulting from it. The following case, which occurred in my private practice, will illustrate the truth of this observation:—

Case LX.—*Calculus Vesicæ in a female Child successfully extracted by dilating the Urethra.*—J. G., aged three years and four months, began to complain, when only two years old, of difficult and painful micturition. It had been gradually increasing since that time, and was accompanied by tenesmus and prolapsus ani. On introducing a small sound, a calculus was distinctly recognized.

7th September, 1829.—The patient was secured as for the operation of lithotomy, and Weiss's instrument, for dilating the female urethra, introduced. It was of the size employed for an adult, and could be inserted only about half an inch. When this part was dilated, the instrument passed into the bladder, and was made to strike against the stone. The dilatation, which was gradually carried to the extent of an inch, was accomplished with more ease than I had reason to expect from the youth of the patient and smallness of the parts, and in ten minutes from its first introduction, the dilator was withdrawn. The finger was introduced to ascertain the size and position of the stone, and the state of the urethra. The calculus, which was as large as a pigeon's egg, was readily seized by a pair of small forceps, and extracted.

For three days she retained her urine for several hours at a time, and voided it in considerable quantities, and without pain; but when the swelling consequent on the extension of the urethra had subsided, incontinence of urine took place, and produced painful excoriations. In ten days these symptoms disappeared, and she has since continued free from any of those disagreeable consequences, which such free dilatation, in so young a subject, might have been expected to produce.

ON WOUNDS OF THE BLADDER.

Hippocrates, Celsus, and many of the older authors, considered wounds of the bladder as being necessarily fatal. This opinion is now ascertained to be erroneous. When this viscus is opened above the pubes, the danger of the urine escaping into the cavity of the abdomen, and producing peritonitis, is imminent. When the same injury is inflicted through the rectum, an occurrence which is but rarely met with, there is, until the sides of the wound are consolidated by inflammation, a great risk of urinary extravasation taking place. After this danger is passed, much difficulty will be experienced in closing the wound, and preventing the formation of a fistula. The edges of the opening in the bladder become callous; and the disturbance and irritation to which the parts are subjected during the evacuations of the feces and urine, add to the difficulty of accomplishing a cure.

Case LXI.—*Lacerated Wound of the Rectum and Bladder, followed by Urinary Fistula—Cure.*—W. J., æt. fourteen, when attempting to leap over a wall, on the 24th May, 1826, fell, with a good deal of force, upon the sharp iron-pikes which covered it. One of these, without producing an external wound, entered the anus, tore open the anterior part of the rectum, and penetrated the bladder behind the prostate. The injury was so extensive, that, besides the free escape of urine into the rectum, the feces, when soft or liquid, passed readily into the bladder. For the first eight days, the febrile symptoms ran high. He had abdominal pain and vomiting, but without any swelling about the anus or perinæum, or other external evidence of urinary extravasation. He was bled, and felt soothed and relieved by the daily use of the warm hip-bath. When the local irritation and general excitement had diminished, the elastic catheter was introduced along the penis into the bladder, removed every second day, and worn for three months. At this time, there still remained a large

fistulous opening, through which the greater part of the urine escaped into the rectum. He became impatient of the restraint and confinement under which he was placed, and refused to submit to the necessary treatment for the cure of the fistula. In about two years from the receipt of the injury, he again placed himself under my care. By retaining a catheter constantly in the bladder, dilating the anus with Weiss' instrument, and then applying the actual cautery to the fistulous opening, a cure was accomplished in about two months.

Case LXII.—*Lacerated Wound of the Rectum and Bladder —Cure.*—J. M'M., æt. twelve, admitted 20th July, 1831. Twenty-four hours before admission, was thrown down and gored by a bull, the horn of the animal having penetrated between the end of the coccyx and anus, passed through both sides of the rectum, laid freely open the neck of the bladder, and lacerated the prostate gland and membranous part of the urethra as far as the bulb, so as to permit the free discharge of urine. The perinæum was also swollen, tense, and ecchymosed; and the parts about the neck of the bladder were so irregular and ragged, that a catheter could not be introduced. —*Leeches to the Perinæum—Warm bath—Ol. Ricini.*

On the 21st, he passed a considerable quantity of urine by the penis. The wounds were suppurating and discharging pus, and the febrile symptoms were moderate. On the 24th, almost all the urine was voided, for the first time, through the wound, between the coccyx and anus. On the 26th, I succeeded in passing a small catheter into the bladder, which was retained, and gave exit to the greater part of the urine. On the 5th of August, there was discharged, through the wound and catheter, a considerable quantity of pus mixed with blood, proceeding apparently from the perineal tumour, which speedily disappeared. The quantity of urine that escaped by the anus and wound, gradually diminished till the 20th, when it ceased altogether; and, on the 29th, the patient was dismissed, cured.

The great extent of the wound, the absence of any tendency to urinary extravasation, or to abdominal inflammation, and the speedy and complete cure that was effected, rendered

this case rather interesting. The swelling in the perinæum might have been mistaken for incipient extravasation of urine; but as it was tolerably defined, covered by ecchymosed integuments, and free of the erysipelatous redness which this accident speedily produces, it evidently depended on contusion.

ON CONTUSIONS OF THE URETHRA.

I SHALL refrain from detailing one or two cases of burst urethra from external injury, which I have had under my care, but proceed shortly to narrate three cases, in which partial rupture of this canal was productive of severe hemorrhage, followed by stricture, without the escape of urine into the neighbouring parts.

CASE LXIII.—*Contusion of the Perinæum—Hemorrhage from the Penis—Stricture—Cure.*—W. G., forty-one years of age, fell on a wall, and sustained a severe blow on the perinæum. This was followed by immediate and profuse hemorrhage, which continued for four days. He experienced pain and difficulty in voiding his urine, and observed that the stream became gradually smaller. Fourteen months after the injury, it was ascertained, by the introduction of a catgut bougie, that a stricture existed behind the bulb, where a small circumscribed tumour was felt externally. By the daily use of silver sounds for nearly three months, and by friction with camphorated mercurial ointment, the obstruction was removed, the tumour disappeared, and the stream of urine regained its former size.

CASE LXIV.—*Injury of the Urethra followed by Hemorrhage and Stricture—Cure.*—J. L., admitted October 26th, 1831. Twelve months ago, received a severe blow on the perinæum, which produced pain, difficult micturition, and hemorrhage from the urethra, which lasted for three or four days, and amounted to three pints of blood. Since that time, he has been forced to void urine every two hours, and the stream has gradually diminished to the size of a crow quill. A stricture was discovered, six and a half inches from the orifice, which prevented the passage of the smallest bougie. A hard irregular tumour was also felt externally in the site of the stricture.

Repeated attempts were made to introduce small sounds

and bougies into the bladder, but for several days these proved unsuccessful. Friction, with the ointment of the ioduret of mercury, was ordered to the perineal tumour, with the occasional application of leeches, hot bath, &c.; at length a small sound, not much larger than the wire of a catheter, was passed through the stricture; and although this practice, as usually happens in similar cases, was occasionally productive of febrile paroxysms, on account of which it had to be desisted from, yet, upon the whole, these were less frequent and urgent than usual. By cautiously increasing the size of the sound, the obstruction was observed to yield; the stream of urine increased in size; and in less than six weeks from his admission, I could pass a full-sized sound into the bladder.

The contraction of the canal was to be attributed to the effusion of lymph immediately exterior to, and into the substance of, the urethra, which became organized, and produced an external tumour, and all the other symptoms usually attendant on stricture. The hemorrhage probably proceeded from that part of the corpus spongiosum which formed the bulb, immediately posterior to which the stricture was situated; it also showed that extravasation of urine does not always follow laceration of the urethra.

The formation of the tumour, and the consequent narrowing of the urethra, may be readily prevented by proper and judicious treatment. The repeated application of leeches during the first ten or twelve days, followed by the occasional introduction of a sound, will seldom fail in effecting this purpose.

Case LXV.—*Injury of the Urethra followed by Hemorrhage —Stricture prevented.*—W. B., æt. sixteen, admitted August 31st, 1831.—Eight days before, fell in crossing a wooden fence, and received a severe blow on the perinæum. In an hour after the accident, when attempting to void urine, a profuse hemorrhage took place from the penis, which ceased for three days, when it again recurred,—the blood lost during the different attacks having amounted to about four English pints. There was also some swelling and tenderness in the perinæum.

He was ordered acidulated drinks, leeches to the perinæum, followed by cold applications, and rest in a recumbent position.

In ten days, the diffuse swelling of the perinæum was reduced, but there still remained, in the site of the injury, a small defined tumour, about the size of a filbert, which evidently encroached on the urethra, diminished the stream of urine, and produced pain and difficulty in expelling it. By the use of leeches, fomentations, iodine frictions, and the daily introduction and retention for an hour or more of a large metallic sound, the tumour and consequent impediment to the evacuation of urine altogether disappeared, and he was cured about the end of September.

The history of this case, the existence of a tumour in the perinæum, where the injury was inflicted, and the profuse hemorrhage that was produced, showed that the urethra was partially lacerated; and the fact of the blood escaping, unmixed with the urine, was conclusive as to its not having proceeded from the bladder or kidneys. We may infer from the amount of the hemorrhage, that the injury to the urethra was considerable; yet the external swelling was trifling, and there was no threatening of urinary extravasation, an occurrence which almost uniformly attends the bursting of the urethra. Its absence can only be accounted for on the supposition, that the laceration did not extend through the entire substance of the urethra, or that, from some accidental circumstance, the aperture was closed against the stream of urine. When the laceration of the urethra is not so extensive as immediately to give rise to extravasation, I have succeeded in preventing it in two cases, by introducing a large elastic catheter into the bladder, and retaining it for several days, until the danger was warded off by the sides of the lacerated opening becoming consolidated.

ON URINARY ABSCESS.

This dangerous and destructive disease may form either internally or externally, in connexion with any of the parts concerned in the secretion or excretion of the urine. It is chiefly, however, when it occurs in the perinæum and scrotum, and is the consequence of stricture in the urethra, that the attention of the surgeon is called to it. The symptoms by which this variety of urinary abscess is characterized, the urgency and rapidity of their progress, and the necessity of prompt and active treatment, are well illustrated by the following case:—

Case LXVI.—*Stricture of the Urethra giving rise to Urinary Abscess and Extravasation—Cure.*—R. C., æt. thirty-five, admitted 23d May, 1831. Had frequent calls to void urine, which was passed after painful and long-continued straining, in a twisted stream not larger than a thread. These symptoms commenced five years before, after a gonorrhœa, which was cured by stimulating injections. On the introduction of a small catgut bougie, a stricture was discovered about three inches from the orifice of the urethra, behind which a good deal of thickening and irregularity of the canal was felt for more than two inches. There was also a second stricture behind the bulb, through which the smallest instrument could not be passed. The prostate gland was enlarged.

On the evening of the day on which he was admitted, and before I had an opportunity of examining his urethra, he had a smart rigor, followed by the usual febrile excitement. On the following day, I found him labouring under acute peritonitis; the abdomen was tumid and exquisitely painful; there was incessant vomiting, urgent thirst and constipation; the countenance was anxious, and the pulse small, sharp, and one hundred and twenty in the minute. He was put under the antiphlogistic treatment, both general and local; but for several days the symptoms continued alarming, and did not subside

until ptyalism was excited by repeated doses of calomel and opium.

On the 1st of June, he complained of increased pain and difficulty in micturition; and his urine was for the first time tinged with blood. A small, hard, circumscribed tumour was discovered in the perinæum, immediately behind the posterior edge of the scrotum, where the irregularity leading from the first stricture terminated. As it seemed to threaten the formation of an abscess, leeches were applied, followed by fomentations, an anodyne enema, &c.; but although it got larger during the two following days, it did not fluctuate. At this time I hesitated as to the propriety of opening the tumour, particularly when I found that, by pressing it, a few drops of pus escaped from the urethra. It appeared probable that a portion of the canal connected with the external tumour had ulcerated, and that the pus was contained in a circumscribed cavity in the corresponding part of the corpus spongiosum. Had I been satisfied that this supposition was correct, I would not have hesitated to make a free incision into the part, from a conviction, that had the urethra been actually perforated by ulceration, the urine, which might have been prevented for a few days from escaping into the surrounding parts by the lining of lymph forming the walls of the abscess, must soon have destroyed this barrier, and become extensively diffused into the cellular texture of the perinæum and scrotum. But as the perineal tumour was small, hard, and circumscribed, and as it was possible that the pus, which could be pressed from it along the penis, might be furnished from the surface of the dilated urethra, immediately behind the stricture, without the existence of a breach in the canal, I determined to watch the case narrowly, and to delay making an incision until the appearances were less equivocal. I have seen more than one case, where, by gradually pressing the pus along the urethra, and preventing its accumulation at the affected part, the tumour has disappeared, and an external opening been rendered unnecessary. I would, therefore, be extremely cautious in making incisions into the perinæum, unless extravasation of urine had actually occurred, or was unequivocally impending, especially in the

unhealthy and broken-down individuals who are so generally the subjects of this disease.

On the evening of the 3d, the tumour in the perinæum began to increase, and to lose its circumscribed form; and before the hour of visit on the 4th, the tumefaction had extended along the scrotum, penis, and groins, to near the umbilicus: the skin was red and hot, and there was less urine passed by the penis than formerly. It was evident that the abscess had given way, and that the urine was escaping by a preternatural opening in the urethra. The patient was therefore placed on a table, and secured as for lithotomy,—a catheter was passed until its point rested on the stricture, and an incision, two inches in length, made into the tumour, giving exit to pus and urine, and showing that the walls of the abscess were thick, and lined by a dense layer of lymph. One or two gentle attempts were made to pass a small catheter into the bladder, both by the penis and wound, but, from the soft and sloughy state of the parts, this was impracticable. It was to be expected, however, that the free opening which was made would permit the urine to escape, and put an end to farther extravasation. A pledget of oiled lint was introduced between the edges of the wound; the tumified integuments were freely scarified; warm fomentations applied; and he was ordered a grain and a half of opium at bed time.

5th.—Is much better, has passed a quiet night, and countenance is less anxious; swelling and redness of integuments greatly diminished; voids his urine freely through the wound; pulse one hundred and sixteen, soft; tongue white, but moist.

For several days the constitutional symptoms continued moderate, and the integuments of the scrotum and penis regained their natural appearance without sloughing taking place; but there was a good deal of hardness and erysipelatous redness of the abdominal integuments, from the symphisis pubis to near the umbilicus. On the 10th, fluctuation was felt; two openings were made, and several ounces of fetid pus, with some shreds of dead cellular substance, were discharged. This abscess was found to communicate with the opening in the perinæum, showing that there was a considerable destruction

of the cellular texture between the penis and pubes. Ordered full diet, and six ounces of wine daily.

The symptoms continued favourable; the discharge from the different openings was moderate; their edges were florid and granulating; and his health was improving. On the evening of the 23d he had a smart rigor, and at the visit on the 24th he complained of pain, on pressure, in the lower part of abdomen; the pulse was one hundred and thirty, sharp; the tongue dry and furred; the skin hot, but moist; and the respiration hurried; the half of the wound in the perinæum had closed, but the urine continued to pass through it in a full and free stream.—*Cluniluvium stat—Ol. Ricini.*

On the 25th, the febrile symptoms and abdominal pain had almost subsided; and in a few days I again attempted to pass a catheter into the bladder, but without success. The urethra, from about the middle of the scrotum to the bulb, was so soft and ragged, that the instrument, by the slightest force, could have been passed in any direction: I therefore ceased to attempt its introduction, until the parts had become firmer and more consolidated.

On the 2d July, the openings in perinæo and above pubes were nearly healed; and the whole urine was voided by the penis in a small irregular stream. On the 20th, the parts were completely cicatrized, and for the first time a small catgut bougie was passed through the stricture into the bladder. This was repeated daily, and retained for nearly an hour,—the size of the instrument being gradually increased, until the largest could be easily introduced. By this treatment, the stream of urine increased; the stricture was destroyed; the irregularity of the canal removed; and he was dismissed, cured, on the 29th of September.

The necessity for prompt and active treatment, and the great benefit of free and early incisions in this class of diseases, are now well known and acknowledged. The object of the treatment consists in laying freely open the perineal tumour, so as to promote the egress of the urine, and prevent its extensive diffusion in the cellular texture. When extravasation occurs, it extends with great rapidity, and the vitality of the parts is speedily destroyed. I have, however, succeeded in two cases,

where the scrotum and penis were red and swollen, by early and free incisions, followed by warm anodyne fomentations, not only in arresting the progress of the extravasation, but also in preventing that destructive sloughing of the parts which is so generally and rapidly produced. The extent to which the urine has spread, can in general be ascertained by the dusky redness of the integuments, which is always present, and which sometimes makes its appearance in a very few minutes after the extravasation has taken place into the subjacent cellular texture. The history and peculiar character of this disease are in general so obviously and unequivocally marked, as seldom to render its recognition difficult. I have met with two cases, however, in which it was mistaken for other diseases by well-informed surgeons; and, in one of these, the neglect of the proper treatment proved fatal.

Case LXVII.—*Urinary Abscess and Extravasation mistaken for Erysipelas—Death.*—I was requested by a surgeon in town to visit an old soldier, who had long laboured under stricture of the urethra. Eight days previously, a small painful tumour began to form in the perinæum, which gradually increased; and was followed, in four days, by a sudden swelling of the scrotum and penis, which extended rapidly to the groins, upper part of the thighs and abdomen, and was speedily productive of redness of the integuments; which, in a few hours, assumed a violet colour. The urine continuing to dribble from the penis, it was supposed that the disease was erysipelas, and that the external swelling had no connexion with the urethra. I made several free incisions into the affected parts, which were gangrenous, and gave exit to a large quantity of fetid urine, mixed with pus. Through one of these openings, in the situation of the original tumour in the perinæum, I succeeded in passing an elastic catheter into the bladder, and drawing off two pounds of urine. From the extent of the extravasation, the dissipated habits of the patient, who was a dram-drinker, and had been long in a warm climate, and the great typhoid depression which existed, but little benefit followed this treatment. He did not survive more than twelve hours.

On dissection, besides the great destruction of the cellular texture and integuments externally, it was found that the urine was extensively extravasated into the cellular substance of the pelvis,—having passed along the crura of the penis, and under the symphisis pubis, so as to form a communication with the sloughy cavity on the surface of the abdominal muscles.

Should the usual symptoms of inflammatory fever have attended the formation and advancement of the tumour in the perinæum, we find that these change their type, and become distinctly typhoid, so soon as the urine has begun to spread into the adjoining cellular substance. I have also observed, that these in their turn disappear,—the countenance losing its sunk and haggard appearance, the tongue its red edges and furred surface, the pulse its irritable and wiry beat, and the skin its coldness, whenever the further extravasation of urine is prevented by a free incision into the perinæum, and the cellular texture is unloaded by numerous scarifications.

ON ABSCESS OF THE PROSTATE GLAND.

The prostate gland is frequently the seat of inflammation, but this is generally of the chronic kind, and rarely ends in suppuration. When this termination occurs, the investing and interlobular cellular substance of the gland is usually the part affected, whilst the gland itself remains sound; the febrile excitement runs high, and the local symptoms are urgent and well marked.

Case LXVIII.—*Abscess of the Prostate, which was discharged by the Urethra—Cure.*—W. H., æt. thirty-six, admitted December 9th, 1831. Complained of frequent, difficult, and painful micturition, with pain in loins, and dull uneasiness, with occasional throbbing in perinæo. These symptoms commenced two months before, and continued for three weeks, until the abscess burst, and the matter, unmixed with the urine, was discharged by the urethra. He slept ill; the tongue was loaded, the thirst urgent, and the pulse accelerated. On introducing a catheter, it produced severe pain at the neck of bladder, where a good deal of irregularity was felt; and on examination per anum, the prostate gland was found enormously enlarged, but smooth and soft.

The treatment, which consisted of the frequent application of leeches to the perinæum, small doses of Oleum Ricini every second morning, the hip-bath, and an occasional suppository at night, was persisted in for about three weeks, during which time the symptoms gradually decreased, the purulent discharge was arrested, and the difficult micturition disappeared.

This was a distinct case of phlegmonous inflammation of the prostate, which ended in suppuration, and could not be traced to any obvious cause. When there is a free communication between the abscess and the urethra, a simple straining effort will, in many cases, be sufficient to expel along the penis a considerable quantity of pus, unmixed with urine; but

in general, the discharge in quantities takes place only when the patient empties his bladder; and then it may either precede or follow this evacuation, or the matter may be so mixed with the urine, as to render it turbid immediately on its being discharged.

When the enlargement of the prostate is great, and especially when the abscess involves the middle lobe, there is always more or less difficulty in expelling the urine. This sometimes amounts to complete retention, and requires the introduction of a catheter; but this ought to be employed only in the most urgent circumstances, as the frequent introduction, or continued retention of the instrument, will be found highly injurious.

When suppuration is fairly established, which may either be in the substance of the gland itself, or in the cellular texture which surrounds it, and unites its lobes together, it is but seldom we can succeed in detecting its existence by manual examination. I have only met with one case, in which, on introducing the finger into the rectum, distinct fluctuation was felt in the tumour: it was large, and projected considerably into the cavity of the bowel. This was punctured three times with a trocar, and a cure accomplished. The pain during the expulsion of the feces was most acute, and there was distressing tenesmus, from a sensation as if there was a hard body lodged in the rectum; but the pains in, or the impediment to, the evacuation of the bladder, were less urgent than usual.

The following case was under treatment at the same time, and in the same ward with the last patient, but the disease was more severe and protracted:—

CASE LXIX.—*Abscess of the Prostate—Retention of Urine—Cure.*—W. P., æt. twenty, admitted December 7th, 1831. Was seized six weeks previously, after a horse had fallen on him, with acute pain about the neck of the bladder, stretching to the glans, and accompanied by frequent and painful micturition, tenesmus, and violent throbbing in the perinæum. During the last three weeks, he has continued to discharge large quantities of pus, separate from and mixed with the urine.

The epididymis of the left testicle was hard, swollen, and painful when handled, without the gland itself being much affected. The prostate gland was much enlarged, and intolerant of pressure, both when this was applied through the rectum, or externally to the lower part of the perinæum.

The antiphlogistic treatment was adopted: leeches were repeatedly applied to the perinæum, followed by hot fomentations, the hip-bath, warm emollient and anodyne enemata, gentle laxatives, and a suspensory bandage to the testicle. By a continuance of this practice, and by keeping him closely in a recumbent position, the symptoms gradually diminished, and on the 20th he was dismissed by his own desire, nearly well. He was again admitted on the 25th, when it appeared that the day before, after acute throbbing pain in the perinæum, and almost complete obstruction of urine, a copious discharge of pus took place suddenly from the urethra, and produced partial relief; but he still complained of painful and difficult micturition, every attempt to empty his bladder giving rise to tenesmus, and a desire to go to stool. The prostate was felt to be larger than formerly, especially its right lobe.—*Hirudin. xviij. perin.—Ol. Ricini.—Vesper. cluniluv.*

26th.—Pain and difficulty in passing urine still continue, but tenesmus has abated; discharge of pus moderate.—*Rept. Hirud. et iterum Vesp. descend. in Baln. tepid.*

January 12th.—Urine has been free of pus for the last three days; but he has been feverish, and complaining of rigors, pain in the perinæum, tenesmus, and an inability to expel his urine, which has been retained for ten hours. The bladder was felt greatly distended above the pubes, and the swelling of the prostate was ascertained, on examination per anum, to have considerably augmented. After using a hip-bath and an anodyne enema, I found it necessary, on account of the urgency of the symptoms, to draw off the urine with a catheter. When the instrument was passed as far as the prostate, it produced excruciating pain: the muscles of the perinæum were spasmodically excited, and the progress of the instrument arrested. After retaining it in this position for about five minutes, and attempting to pass it into the bladder, I had only advanced its point a few lines, when there was discharged by it fully two

ounces of pus. It then slipped readily into the bladder, and gave exit to nearly two pounds of urine. Its introduction was not again necessary.

16th.—Calls to void urine vary in frequency from one quarter of an hour to two hours. Complains only when expelling the last drops, and there is less pus discharged.—*Sum. Tinct. Mur. Ferri gtt.* xx. *ter indies.*

30th.—The pain and difficulty in micturition have increased, and there is more pus in the urine, which frequently escapes involuntarily. Prostate continues enlarged, and there is throbbing in perinæo.—*Omit. Tr. Ferri—Sum. Aq. Potassæ gtt.* xxx. *ter quotidie—Hirudin. xviij. perinæo—Baln. tepid.—Enema emollien.*

The symptoms gradually subsided, and he was dismissed, cured, on the 12th of February.

When the irritation at the neck of the bladder is great, the testicle becomes often affected. In the last case, the inflammation seemed to have extended along the cord, producing hardness and thickening of the epididymis, without the gland becoming involved. This irritability of the prostatic portion of the urethra sometimes continues long after the abscess has closed, and is the cause of painful and impeded micturition. For this, in addition to the usual local and soothing treatment, I have experienced great advantage from small doses of the liquor potassæ.

When phlegmonous inflammation of the prostate gland occurs in old and enfeebled subjects, and especially when it is the consequence of stricture of the urethra, the destruction which it occasions is sometimes so extensive, as to lead to a fatal termination, by giving rise to urinary extravasation. In such cases, the prostatic disease is almost always the consequence of acute inflammation of the mucous membrane of the neck of the bladder, and origin of the urethra; which inflammation may exist for a considerable time before the gland or its cellular connexions become implicated.

Case LXX.—*Abscess of the Prostate—Death from Urinary Extravasation.*—W. G., æt. fifty-nine,—12th November, 1826.

Eleven years ago, when a soldier in the West Indies, had an attack of gonorrhœa, which was followed by a stricture in the membranous part of the urethra. For months, the difficulty in expelling the urine was very great, the stream was small and twisted, and there was pain in the perinæum, with occasional discharges of muco-purulent matter from the penis. These symptoms became more and more urgent; he had rigors, throbbing in perinæo, and, ultimately, complete retention of urine. On attempting to introduce a gum-elastic catheter, which was accomplished with difficulty, the prostate gland was found much enlarged, but soft, and so exquisitely painful, that the instrument had to be withdrawn so soon as the bladder was emptied. In a few hours after, there was a copious discharge of pus from the urethra, the throbbing pain diminished, and the excretion of the urine was less impeded. In a few days, however, the local and constitutional symptoms increased; it was found necessary to introduce a catheter into the bladder, and to retain it for several days. Yet, notwithstanding of this, the disease of the prostate increased with rapidity; there was a copious discharge of fetid matter; typhoid symptoms appeared; and the patient sunk from irritation and exhaustion.

On dissection, it was found that the substance of the prostate was extensively destroyed, so as to form a large suppurating cavity, through which the urine was extensively extravasated into the cellular tissue of the pelvis and perinæum.

ON PROLAPSUS OF THE ANUS.

This troublesome complaint, when it occurs in elderly people, may resist all the ordinary local remedies, and be curable only by a surgical operation. It is with the view of directing attention to the utility of the treatment recommended by the late Mr. Hey of Leeds, in continued and obstinate forms of this disease, that I shall shortly narrate the three following cases:—

Case LXXI.—*Prolapsus Ani, cured by Mr. Hey's operation.*—A. M'D., æt. fifty-eight, admitted 15th May, 1826. Had been a patient in one of the medical wards for several weeks, on account of diarrhœa, which was accompanied by tenesmus and prolapsus ani, with bloody and mucous evacuations. The bowel-complaint was better; but the slightest straining, on attempting to empty the bladder or rectum, caused an immediate prolapsus. This also occurred when he got into an erect position, the tumour which formed appearing to be composed of two different parts. Close to the verge of the anus, there was observed a broad, livid-coloured fold of the mucous membrane, which had an irregular surface, apparently produced by a varicose enlargement of the hemorrhoidal veins; this surrounded the larger and central tumour, which was evidently formed by a protrusion of the gut itself. A good deal of pain and hemorrhage followed the descent of these parts, but they were readily returned when he was recumbent.

The total inefficacy of every mode of treatment which Dr. Brown, one of the physicians to the Infirmary, had judiciously employed, and the existence of great relaxation of the integuments around the anus, led me to try Mr. Hey's operation. The whole loose integument was removed with a pair of curved scissors, along with a portion of its subjacent cellular texture, but without including any of the tuberculated fold of mucous membrane, which escaped from within the sphincter.

A firm compress and T bandage were applied; he was confined in a recumbent position; proper attention was paid to his bowels; and although a prolapsus took place for several days on his going to stool, yet a cure was accomplished, and he left the house on the 16th of June.

Case LXXII.—*Prolapsus Ani, cured by Mr. Hey's operation—Troublesome Hemorrhage.*—E. W., about fifty years of age, had been affected with a prolapsus ani for nine months, and had tried a variety of treatment before he applied for my advice, in the waiting-room of the Infirmary, on the 24th July, 1826. He had a sallow, unhealthy appearance; and the protruded parts, which escaped when he was standing, as well as when he went to stool, were large, thickened, livid, painful, and bled on the slightest touch. The loose integuments around the anus were removed by the curved scissors, along with an irritable and slightly-ulcerated portion of the mucous membrane, which was projected from within the sphincter. The hemorrhage was rather profuse, but appeared to be arrested by the application of a cold compress, and firm pressure: it, however, returned in three hours; the patient became faintish and cold; he had an urgent desire to go to stool; and, on removing the bandage and compress, he voided nearly a pound of coagulated blood. By using the dilator, a small bleeding vessel was secured within the sphincter, and both ends of the ligature cut off close to the knot. In a fortnight, the prolapsus was effectually cured, and the patient speedily regained his former state of health.

The following case was cured by operation, after resisting every variety of treatment for about two years:—

Case LXXIII*.—*Prolapsus Ani—Operation—Cure.*—W. A., aged fifty-four, became a district patient in the beginning of February, 1829, on account of the above troublesome disease. The gut descended for more than two inches on every attempt to evacuate the bowels, accompanied by considerable

* Glasgow Medical Journal, vol. ii. p. 333.

pain and tenesmus. When he remained for a few minutes in an erect position, the same displacement took place slowly, although no propulsive efforts were employed; this, however, he could prevent by pressure on the anus. There was first projected from the anus, a circular fold of the mucous membrane of the rectum, at its verge, of a livid colour, and tuberculated appearance, soon followed by the complete descent of the bowel and hemorrhage from innumerable points. He generally succeeded in replacing the part, by assuming the recumbent posture, and maintaining gentle, but continued pressure for a few minutes. At an earlier period, however, the protrusion often continued for hours, before it could be returned. His general health was greatly impaired, and he was unable to follow his employment, from the continued irritation and almost daily attacks of hemorrhage.

On examining the anus after the gut was replaced, the surrounding integuments were found extremely relaxed. There existed such an unnatural looseness in the attachment of the skin around the anus to its corresponding cellular membrane, that it could be easily drawn out with the fingers, in the form of one or more large flaps. Having succeeded in two similar cases, which came under my care in the Royal Infirmary, during the summer of 1826, in completely curing the disease, by cutting off the loose integuments, as recommended by the late Mr. Hey,* I determined to try it in this case. The skin was drawn as far out as possible into broad flaps, and cut off with the scissors in a circular direction, until all the superfluous integument was removed, including a portion of the livid and tuberculated fold of mucous membrane which was projected from within the sphincter. The pain was trifling, and only a few drops of blood were lost. A soft compress and T bandage were applied, and he was strictly confined to bed. For a few days, a partial procidentia took place on every attempt to go to stool. He had a good deal of pain and inflammation around the anus, with complete retention of urine, which required the frequent introduction of the catheter. In ten

* Practical Observations in Surgery, 2d edit. p. 444.

days after the operation, he was able to walk about, and void his stools, without any return of the disease, and in three weeks he was perfectly cured. Pressure was continued to the part for some time longer, occasional doses of castor oil were prescribed, and he was enjoined to avoid straining at stool.

There will generally be found in obstinate and long-continued forms of this disease, a great relaxation in the connexion of the rectum at its lower part, with the surrounding textures. This circumstance, although it may not be the original cause, is sufficient, in many cases, to account for the continuance of the displacement in chronic and inveterate cases, although I believe it is generally accompanied by a diminished power of the sphincter. If the rectum, in consequence of being much irritated, as in various bowel complaints, ultimately becomes relaxed, the tenesmus, which is an invariable attendant, may so overcome the sphincter as to give rise to a procidentia. But when, as in the case now detailed, the erect position is sufficient to cause a descent of the gut, we have grounds for believing, that besides the relaxed state of the rectum, there exists a want of power in the sphincter muscle, which part, along with the levator ani, is mainly instrumental in maintaining the rectum in its natural situation. In the cases detailed by Mr. Hey, there existed, in combination with relaxation of the integuments, one or more livid tubercles at the verge of the anus, which were also removed. He expected from this operation, that inflammation of the surrounding cellular texture would be excited, the attachments of the rectum consolidated, and the power of the sphincter improved. In a majority of cases, the disease will be found to yield (although the cure is often tedious and protracted) to the local applications and internal remedies usually employed. Should it continue, however, as sometimes happens after the exciting cause has been removed, we will occasionally find that the loose state of the skin around the anus, and the relaxed attachments of the rectum at its termination, become the primary causes of the continuance of the disease. It is, I conceive, in such circumstances that this simple operation may be beneficially adopted.

ON THE MORBID ENLARGEMENTS OF THE CLITORIS AND NYMPHÆ.

I SHALL not now enter into any details regarding the congenital deviations from the natural appearance and size which these parts occasionally exhibit, but shall content myself with shortly narrating such cases of morbid enlargement as have presented themselves to my notice, and have required surgical interference.

CASE LXXIV.—*Chronic enlargement of the Clitoris and Nymphæ—Amputation of the parts—Cure.*—Mrs. M., æt. twenty-five, admitted January 21, 1832. The clitoris formed a large pendulous and pyriform tumour, the pedicle of which was as thick as the thumb, and could be traced, in its enlarged state, for more than an inch under the pubes. The nymphæ were also considerably elongated, thickened, and had a warty appearance; and they, as well as the clitoris, were covered by a thin, smooth, and pale-coloured cuticle. The disease began two and a half years ago, six months after she had a syphilitic sore on the right nympha, which healed under mercury.

The history, progress, and appearance of the tumours, were conclusive as to their non-malignancy; they were, therefore, amputated on the 23d. The nymphæ and clitoris were pulled out as far as possible from the pubes, the external labia held aside by an assistant, and the parts divided close to their base, during which she seemed to feel exquisite pain. Three vessels were tied; the wound was covered with lint, and a T bandage applied; the parts granulated, and soon cicatrized.

On making a section of the parts, it was found that, in place of their naturally loose and spongy texture, they were firm and compact, but not otherwise morbidly changed.

When the clitoris and nymphæ are so elongated as to project beyond the labia, their natural appearance is destroyed, their functional sensibility impaired, and they obtain a covering of thin opaque cuticle. This change would lead to the belief,

that at one time the affected parts had been in a state of ulceration, and that their peculiar appearance depended on recent cicatrization. This is, however, not always the case: for although these morbid enlargements are often affected with superficial ulceration, yet, in general, the change in the appearance and structure of their external covering is to be attributed to the exposure and irritation occasioned by their external position, and to the want of the moisture by which they were formerly lubricated. They thus become dry and smooth, and the fine mucous membrane, which originally covered them, loses its natural appearance, structure, and secreting power, and is converted into an opaque and insensible cuticle.

In the following case, from the long continuance of fluor albus, and inattention to cleanliness, excoriations took place; chronic inflammation of the nymphæ and clitoris was excited; these parts enlarged slowly, projected beyond the labia, and, after seven years' growth, they were found hanging down to near the middle of the thighs.

Case LXXV.—*Enlarged Clitoris and Nymphæ successfully extirpated.*—Mrs. P., æt. forty-six—February 14th, 1827. —The clitoris, which had been slowly increasing in size for about seven years, was nearly eight inches long, and of a pyriform shape. The pedicle was soft, as thick as the wrist, and traversed by varicose veins, whilst the most depending part of the tumour was hard, nodulated, and fully the size of two fists. The nymphæ hung alongside the pedicle for two and a half inches; they were irregular on the surface, covered by a thin white cuticle, and had a fleshy feel. The inner surface of the labia was covered by small tubercles, each being about the size of a split pea, and seated immediately under the mucous membrane. On the 20th, the diseased parts were amputated; the hemorrhage was profuse, but was arrested by the application of five ligatures; a catheter was introduced, and retained in the bladder for several days. When the wound began to granulate, the urine was daily drawn off; by which means, the healing of the parts was accelerated, and complete cicatrization effected in about three weeks. I have

lately seen this woman, and ascertained that she is in good health, and has not had any threatening of a return of the disease.

The diseased parts were of a solid, fibrous texture; and the nodules, which occasioned the irregularity on the lower part of the clitoris, were situated immediately under the investing integument, and seemed to be in some measure distinct from the general tumour.

The clitoris of the female, as well as the penis of the male, may be affected with cancer. When the crura are enlarged, indurated, irregular, and painful, we may rest assured that the disease is beyond the reach of the knife, especially when the pendulous part of the tumour exhibits the characters of carcinoma. I was present, several years ago, at an operation for the removal of a cancerous clitoris: in this case, the nymphæ were not affected. The patient was secured as for the operation of lithotomy, and an attempt made to remove the diseased crura. After a painful and protracted dissection, during which the patient lost above a pound of blood, it was found impossible to remove all the affected parts. In a few weeks, a small fungous tumour began to project immediately above the meatus urinarius: it gradually enlarged; occasioned acute pain; bled profusely; and ultimately produced death. We ought to recollect, however, that, in a simple, benign enlargement of the clitoris, the crura may also be affected; but that this ought not to militate against the amputation of the diseased parts; for if the crura be divided, and allowed to remain, they will soon shrink and disappear.

Case LXXVI.—*Carcinoma of the Clitoris—No operation.*—A poor woman, about forty-five years of age, having that peculiar expression of countenance, and leaden complexion, which so frequently indicate the existence of malignant disease, applied for admission into the Infirmary, in February, 1827. The clitoris was about the size of the fist; had a hard, irregular feel; was the seat of lancinating pains; and, towards its apex, it contained several deep ulcerated excavations, having thickened and everted edges, from which a thin sanious discharge issued, and produced painful excoriations. The

disease, which had existed for eleven years, and was attributed to a kick she received from her husband, produced no pain till about eight months ago, a short time before it ulcerated, when her health became affected. She had a discharge from the vagina, with pains in the back and loins; and, on examination, the os uteri was found indurated, painful, and apparently ulcerated.

In this case, the clitoris was evidently carcinomatous, as was also the os uteri. She was therefore dissuaded from any operation, returned home, and died in four months after. I was permitted to inspect the body, and to remove the diseased parts. The structure of both the clitoris and os uteri was decidedly carcinomatous: there were also diseased glands, some of which presented the same morbid structure in the groins, and in the pelvis. The disease had extended along the crura of the clitoris to their origin, from the ischii and pubes.

IMPERFORATE VAGINA.

To show the danger which sometimes follows operations on the sexual organs of the female, as well as to confirm a curious physiological fact regarding the uterus, I subjoin, from my private Note Book, the following case :—

CASE LXXVII.—*Imperforate Vagina—Operation followed by Peritonitis and Death—Uterus wanting.*—Mrs. C., about twenty-eight years of age, consulted me on the 4th of February, 1823. She was rather a stout, well-formed woman, but had a pale and sickly appearance. After stating that she had been subject to severe attacks of epistaxis, at irregular intervals, since she was sixteen years old, and to vertigo, flatulence, palpitations, pains in the lumbar region, vomiting, occasional diarrhœa, &c., she confessed that she had never menstruated. On farther inquiry, I found that she had been married for twelve months, and that there existed an obstruction in the vagina, which she was anxious to have destroyed.

On inspection, the external orifice of the vagina was found completely closed by a thick, firm, muscular-looking substance, continuous with the inner margin of the labia, and adhering to the pubes below and around the urethra, so as to leave not the slightest vestige of an opening. It had neither the feel nor appearance of a membrane, but was granular on the surface; and when the labia were freely separated, bands of muscular-looking fibres were seen passing to it. The little finger could, by pushing this obstacle before it, be introduced about half an inch into the vagina, which was excessively small and contracted. The external parts were well formed, and the orifice of the urethra was natural, but the clitoris was unusually small. There was no swelling in the hypogastrium, the bladder and rectum were free of obstruction, the mammæ were plump and well formed, and the sexual appetite was not deficient.

From her great anxiety to have this malformation destroyed by an operation, I agreed to perform it on the afternoon of the day on which she first consulted me. Having placed her in the lithotomy position, I commenced, with the assistance of my friend, Dr. Weir, by making an incision, with a bistoury an inch and a half in length, in a perpendicular direction, through the centre of the fleshy-looking obstruction. I then thrust forward a sharp-pointed, narrow bistoury, for more than an inch opposite the orifice, into the vagina, directing the point rather downwards, with the blunt edge to the pubes, to avoid wounding the urethra. I found, however, from the great thickness of the substance, and the uncertainty regarding the position of the parts in the track of the vagina, that a continuance of this mode of procedure was neither safe nor justifiable. I could not succeed in forcing a probe or a director through the remaining portion; I therefore divided and removed, by means of the forceps and scissors, several layers of it. By keeping a catheter in the urethra as a guide, and by occasionally introducing the finger into the rectum, I was successful in clearing a passage fully two inches in depth. There was still, however, an obstructing portion, beyond which there appeared to be a free cavity. Through this a pair of dissecting scissors were passed, and the remainder of the obstruction divided by introducing a director into the opening thus made, getting it behind the upper part of the obstruction, and forcing it nearer the external orifice. The finger was then passed into the upper part of the vagina, which was lubricated apparently by mucous, but no uterus could be detected. A small piece of soft sponge, through which a strong thread was passed, was inserted, and a few strips of lint were placed between the external lips of the passage.

5th.—Could not be persuaded to keep the house, but called for me to state how free from pain she had been since the operation; considerable sanguineous discharge from vagina; the sponge was withdrawn, and the parts lightly dressed with oiled lint.

On the 8th, she was exposed to a severe snow-storm, while assisting her husband in his trade as a broker; in the evening

she was intoxicated, and even guilty of other irregularities, to which rigors, acute pain in the right side of the abdomen, flatulent distention and nausea, speedily succeeded.

9th.—The peritoneal inflammation appears to proceed rapidly; the tension and pain of abdomen are now more urgent; there is vomiting, with furred tongue and diarrhœa; pulse one hundred and thirty-six, small and wiry; skin hot and dry. —*Was bled three times, to the amount of forty oz.—had a dose of Ol. Ricini, followed by fomentations to the abdomen—Calomel and opium—and the injection of tepid water into the vagina.*

10th.—The symptoms, for several hours in the forenoon, were moderated by the application of a large blister to the abdomen; in the evening they were much worse, and appeared to be aggravated by the imprudent conduct of her attendants, who, contrary to the most positive injunctions, gave her wine to support her strength, opium pills to procure sleep, and nitre to remove the strangury occasioned by the blister. The belly was excessively tumid, tympanitic, and exquisitely painful on pressure; the breathing hurried, the countenance sunk and anxious, and the vomiting almost incessant; pulse one hundred and fifty, tremulous and compressible; tongue dry and furred.

11th.—Vomiting abated—pain of abdomen still continues as acute and extended—appears to be sinking rapidly. Died on the morning of the 12th, at two o'clock, about two hundred and three hours after the operation.

13th.—The body was inspected, in presence of Dr. Weir, Mr. Stirling, and several of my pupils. The omentum and the peritoneal covering of the intestines and abdominal muscles were covered with patches of inflammation of a bright red colour, as was also, in a smaller degree, the peritoneum, covering the fundus of the bladder, and that portion of it in which the uterus is usually involved. The ovaries were well formed and large, the fallopian tubes were each one inch and a quarter in length, their fimbriated extremities being perfect. There did not exist the slightest vestige of a uterus, its usual situation between the transverse folds of the peritoneum being occupied by a portion of condensed cellular substance, about the size of a filbert, which was more than an inch distant from the uterine extremities of the fallopian tubes, and was but loosely attached

to the peritoneum. When the finger was introduced into the vagina, the cavity at its upper part was ascertained to be formed by the peritoneum, between which and the upper boundary of the obstruction there was a free space capable of containing a small lime. The vagina, when slit open, presented an ash-grey appearance; the urethra, bladder, rectum and peritoneum were uninjured.

The obstruction in this case was evidently congenital, and differed, both in situation and appearance, from that cohesion of the parts which is sometimes produced by neglected ulceration. An obstruction from the latter cause may occur both in children and adults; it is, however, rarely confined to the vagina, but more generally involves the external parts, as the nymphæ and labia. The most extensive case of this kind which I recollect to have met with, was in a prisoner in the Bridewell of this city in 1817, during the short period of my attendance as surgeon to that establishment. From a long-continued gonorrhœa and want of cleanliness, the lining membrane of the labia, and the inner surface of the nates around the anus, became excoriated and ulcerated, and adhesion by granulation took place through their whole extent, leaving only two small openings for the escape of the urine and feces. The adhesions were divided, and the parts restored to their natural state.

We are told that when the uterus is altogether wanting, or of a small size, the external parts are but imperfectly developed, and the vagina is either very short, or altogether obliterated. In this case, all the external parts were well formed and entire, and the mammæ were fully developed, yet no uterus existed—this circumstance is, however, easily explained, when we find that the ovaries were present. These organs are known to be more intimately connected with the growth of the external parts of the female than the uterus, and when they are absent, the marks of puberty are rarely, if ever, exhibited.

ON FRACTURES.

It is impossible, in the short space to which this article must be limited, that I can enter into a detail of all the curious or complicated cases of fracture which have been admitted into the Infirmary during the course of my attendance; I must content myself by narrating such of them only as present some feature of novelty, or are practically interesting.

Case LXXVIII.—*Comminuted Fracture of the right Tibia and Fibula—Traumatic Delirium—Cure.*—J. W., three hours before he was admitted, on the 12th November, 1826, fell from a height, and sustained a comminuted fracture of the right tibia and fibula, about the middle of the leg. The surrounding soft parts were swollen, ecchymosed, and painful. The usual bandages, bran pillows, and lateral splints, were applied, and the limb was laid in the straight position. On the third day, the febrile excitement was unusually high; and as the swelling, pain, and tension were considerable, the bandages were undone and the limb examined. The inferior half of the leg and foot were swollen, painful, and covered with amber-coloured vesications, but with hardly any redness of the integuments. The swelling in the site of the fracture was tense and elastic, whilst that of the foot was soft and œdematous. Leeches and cold lotions were applied, the front of the limb being left exposed for that purpose, and the motion of the fractured bones prevented by the loose application of the splints. He was freely purged, took small doses of a saline diaphoretic and an opiate at bedtime.

When the vesications were ruptured, the exposed integument had a dark mahogany-colour; but by the use of the camphorated spirit of wine this was removed, and healthy action established. On the 24th, he was observed to be restless and irritable, and in the evening he was delirious. He attempted to get out of bed, and to remove the bandages from his limb; his hands were tremulous, and incessantly in motion; his face

pale, pupils contracted, skin bathed in perspiration, pulse one hundred and thirty, feeble; tongue furred, but moist. Notwithstanding the exhibition of large doses of opium, both by the mouth and by enema, and the free use of the solution of the carbonate of ammonia, the nervous excitement continued to increase for seven days. His pulse became so rapid and indistinct that it could not be counted; the eyes were unusually prominent, the pupils dilated and indolent; there was continued incoherence, incessant jactitation, subsultus tendinum, &c., and he passed his urine and feces involuntarily. At this time I learned that he had been previously addicted to the use of ardent spirits, and I therefore, in addition to opium and carbonate of ammonia, ordered him one ounce of whisky every hour. After the fourth dose he became more tranquil, slept for an hour, and awoke relieved and collected. By a continuance of this treatment, all the unfavourable symptoms disappeared, and he was dismissed on the 20th of January following.

It would be easy to multiply examples of delirium tremens supervening on fractures and other injuries, even when these were slight and unimportant. Such an occurrence is by no means rare in this hospital. I have uniformly observed, that it was confined to those who were accustomed to the use of ardent spirits, by the daily and pernicious practice of dram-drinking,—a practice which still continues to gain ground among the poorest classes of our city population, and is a fruitful source of moral degradation, as well as of physical wretchedness and disease, and that to an extent which few would be willing to credit. I have long been convinced of the general existence of this habit among that class of the population which furnishes our Infirmary with the greatest number of fractures, and of its baneful influence, even in the simplest and most trivial cases, in aggravating and modifying the constitutional symptoms which these injuries produce; and I have, therefore, been led, in all cases, to institute the strictest inquiry as to the kind and quantity of stimuli to which the patient had been accustomed during health, so that I might be able to combat the first appearance of constitutional disease, by the exhibition, in moderate quan-

tities, of that stimulant, to the influence of which, the system had become, in some measure, habituated. I have seen innumerable instances of patients who were accustomed to the daily use of ardent spirits, and admitted for some trivial injury, get rapidly worse, until a small allowance of their accustomed beverage was granted; soon after which, all the unfavourable symptoms disappeared: and I have often failed in allaying the nervous excitement, which forms so prominent a feature in this disease, or in procuring sleep by large and frequently repeated doses of opium, unless a moderate quantity of spirits was at the same time administered.

When there exists high cerebral excitement, I have frequently derived benefit from the exhibition of the carbonas ammoniæ, conjoined with opium; but even with this combination, we shall often fail, after large and numerous doses, in procuring sleep, or diminishing the irritability of the nervous system. I have succeeded, however, in some cases, in allaying the cerebral excitement, and thus paving the way for the more rapid and decided action of the opium and other stimulants, by either nauseating the patient, for several hours, with small doses of the tartar emetic solution, or by the effusion of cold water on the head. If the former plan be adopted, the medicine must be carefully regulated so as to prevent vomiting; and, should we succeed in maintaining decided nausea for three or four hours, we shall then find that a full dose of opium, whether exhibited by the mouth or the anus, will seldom fail in procuring sleep. When the face is much flushed, and the patient is so violently delirious as to require coercive measures, I have experienced marked benefit from directing a stream of cold water on the head from a considerable height, and continuing it until paleness of the countenance and a degree of collapse was produced; after which, a full dose of opium has almost uniformly succeeded in tranquillizing the patient. The efficacy of the practice was apparent in the following case:—

Case LXXIX.—*Simple Fracture of the left Femur—Traumatic Delirium—Cure.*—W. G., a robust man, aged thirty-two, sustained an oblique fracture of the left femur about its

middle, by a fall from a window. In twenty-four hours after the accident, he was unmanageable, and exhibited all the symptoms of delirium tremens. For two days, the usual remedies were freely, but unsuccessfully employed; his face was flushed; his pulse rapid and feeble; he had constant jactitation; talked incessantly, and was annoyed by spectral illusions. By allowing a stream of cold water to fall on his head, a slight convulsive movement was produced; he became pale, and his head dropped on his breast, as from syncope. While in this state, eighty drops of laudanum were given in a glass of hot brandy-toddy, and the same medicine was administered in the form of enema. He soon fell asleep, and awoke in two hours greatly relieved. By continuing the opium and stimulants for another day, the nervous excitement was removed; and, in the usual space of time, he was dismissed, with the fracture perfectly united. I have only met with one case of traumatic delirium which proved fatal; the disease commenced a few hours after the accident, advanced with unusual rapidity, and was accompanied by gangrene of the injured part.

Case LXXX.—*Simple Fracture of the right Tibia and Fibula, followed by Traumatic Delirium, Gangrene, and Death.*—W. R., aged about fifty-six, while in a state of intoxication leapt from the top of one of the Edinburgh coaches, of which he was guard, when about three miles distant from Glasgow, and sustained a simple fracture of the right tibia and fibula. In less than two hours he was admitted into the Infirmary, and the usual bandages and splints applied. In the evening, when I saw him for the first time, he was irritable and restless; and I learned that, for years, he had been accustomed to swallow more than half a bottle of brandy daily. Besides his usual stimulus, he was ordered opium and ammonia; nevertheless, the disease increased; he got out of bed, walked on his fractured leg, and attempted to tear off the bandages; so that it was found necessary to secure him in a strait jacket. On the following day, his hands were tremulous, and in constant motion; his countenance was pallid and collapsed; his skin covered with a cold, clammy perspiration; his pulse rapid, feeble, and

intermittent; and the powers of life were evidently sinking. On examination, it was found that gangrene had commenced in the soft parts around the fracture. He became gradually comatose, and expired suddenly, after a severe attack of convulsions, about thirty-six hours after the receipt of the injury. On inspection, the vessels of the meninges, and of the brain itself, were unnaturally turgid. There was serous effusion under the arachnoid, and into the ventricles and base of the brain. The fracture of the tibia was rather oblique, but the bones were in apposition, and the gangrene was confined to the integuments and cellular tissue. The nerves between the injured part and the knee were in a state of congestion.

The following case shows the propriety of attempting to procure bony union in fractures of the neck of the femur, immediately exterior to the capsular ligament; even when, from the advanced age of the patient, this termination cannot always be expected to take place:—

Case LXXXI.—*Fracture of the Neck of the Femur, exterior to the Capsule of the Joint, in a woman of seventy—Bony union accomplished.*—Mrs. M., aged seventy, when going down a stair on the 8th of October, 1831, her foot slipped, and she fell on her right hip. On the following day, when she was admitted into the Infirmary, the neck of the femur was found to be fractured; and, after careful examination, the fracture was pronounced to be exterior to the capsular ligament, and the limb put up in the straight position, according to Desault's method. The leg was shorter than the other by nearly three quarters of an inch; the foot was everted; the hip flattened; distinct cripitus was felt on rotating the limb, without employing extension; and there was some swelling and tension, with acute pain in the groin and behind the trochanter.

This case proved more than usually successful; and although she was feverish for several days, and complained of acute pain in the hip and groin, yet these symptoms gradually disappeared; she became more easy and comfortable; her health did not suffer, and no sloughing took place. The splints and bandages were removed at the end of the sixth week, when

firm bony union was found to have taken place; the natural length of the limb was preserved; and, in a fortnight longer, she could walk without lameness, or the aid of crutches.

It may happen, when a fracture extends into a joint, that the passive motion, which it is found necessary to employ before firm union has been produced, may cause the detachment of a portion of the callus, especially if it is over-abundant, and give rise to a loose bony tumour, which shall occasion deformity and pain, and interfere with the free motions of the articulation.

Case LXXXII.—*Fracture of the inner Condyle of the Humerus, followed by the formation of a loose Osseo-Cartilaginous Tumour in the Elbow Joint.*—G. S., aged forty-five, while walking on the ice on the 22d February, 1827, fell on his left elbow, and sustained an oblique fracture of the inner condyle of the humerus. The arm was slightly bent, and the hand in a state of pronation; cripitus was distinctly felt on performing flexion and extension, and the internal condyle was partially moveable. The arm was bent to relax the muscles arising from the fractured condyle; a figure of eight bandages was applied; the joint surrounded by pasteboard; the arm supported in a sling, and a spirit lotion applied. About a month after the accident, pretty firm union was found to have taken place, but the motion was exceedingly limited, and this appeared to depend on an unusually firm, rather defined, swelling in front of the joint, close to the fractured condyle. After passive motion and friction had been continued for a fortnight, and the natural mobility of the joint was considerably restored, the tumour, which was hard and irregular, was ascertained to be moveable. It continued unchanged in size and situation, and was frequently productive of acute pain when particular motions of the elbow were performed. I proposed to remove it by operation, but the patient refused to submit, and left the Infirmary. He died of phthisis in April, 1830; when, on inspection, I found the joint to contain a loose osseo-cartilaginous tumour, about the size of a walnut, which had a smooth and polished surface. It did not appear to have been formed

by a detachment of any portion of the fractured condyle, but by the deposition of exuberant callus.

The astragalus is sometimes fractured in compound dislocations of the ankle-joint, but a simple fracture of this bone is very rarely to be met with. It is not even alluded to in any of the systematic works on Surgery, which I have had an opportunity of consulting.

Case LXXXIII.—*Simple fracture of both Astragali—Cure.*—D. Q., æt. twenty-two, admitted 23d April, 1832. Two hours previously, fell from a window which he was cleaning, about fifteen feet from the ground, and alighted on his heels. There was a good deal of swelling immediately under the ankles, especially on the outer side of the feet, and he complained of acute pain on the slightest motion. The tibiæ, fibulæ, and calces, were found entire, but both astragali were distinctly ascertained to be fractured, although not displaced. On grasping them, and moving the feet, crepitus was felt, and a fractured portion of the bones could be made to project under the fibulæ, by carrying the feet inwards. By the application of leeches, cold lotions, and bandages without splints, the union of the parts took place, and in five weeks he was able to walk with the aid of crutches. The mobility of the ankle-joints was not in the slightest degree impaired.

Instead of proceeding to detail a case of simple fracture of the superior maxilla, which produced high constitutional disturbance, and profuse suppuration of the antrum,—a case of fracture of the tibia, which, from the injury to the soft parts, was productive of extensive subfascial inflammation requiring free incisions; several cases of fracture of the ribs, with extensive emphysema; a case of oblique fracture of the femur, in which, at the end of five weeks, no union was found to have taken place, but where this was accomplished by forcibly rubbing the ends of the bone together, re-applying the splints, and placing the patient on full diet, &c.; or of stating my experience as to the results of fractures of the neck of the

femur, of the humerus, and of the scapula,—I shall confine the remaining remarks I have to make on this important class of injuries, to the subject of *compound* fractures.

When it has been determined to attempt the preservation of the limb in a case of compound fracture, it is of the highest importance to the comfort of the patient, and the success of the cure, that the edges of the wound be brought into close and accurate apposition; that the injured parts be firmly and equably supported; and that the process of adhesion, which we are so anxious to produce, be not unnecessarily and improperly interfered with, by a too frequent renewal of the dressings. The advantages of this mode of treatment, although forcibly pointed out by Larrey, Cooper, and others, do not seem to be sufficiently appreciated by the profession. The three following cases are evidences of its utility:—

Case LXXXIV.—*Compound fracture of the Tibia—Dressings removed, for the first time, on the thirty-first day—Wound found healed, and fracture united.*—A. C., a healthy labourer, forty-nine years of age, sustained a compound fracture of the right tibia, in its lower third, with simple fracture of the fibula, on the 20th of March, 1827. An oblique portion of the upper end of the bone projected through a ragged, transverse wound, on the fore-part of the leg. There was little bleeding, but the contusion of the surrounding soft parts was considerable. On relaxing the gastrocnemii muscles, the projecting portion of bone was readily reduced—the limb was placed in the straight position—the edges of the wound were brought into accurate contact by short stripes of adhesive plaster—it was then covered with a compress of lint soaked in blood—a Scultetus' bandage was adjusted, and the usual cushioned splints applied. For several days, the febrile excitement was rather high, but by blood-letting, and the use of purgatives and diaphoretics, the unfavourable symptoms were subdued; and as there existed but little pain, swelling, or tension in the site of the injury, as the discharge from the wound was merely sufficient to stain the bandages, I refrained from removing the dressings till the thirty-first day from the receipt of the injury. The wound was then found entirely cicatrized, and the fractured tibia united.

CASE LXXXV.—*Compound fracture of the right Tibia cured—Advantages of little interference with the wound.*—R. W., æt. twenty, had his right leg entangled in a chain, and dragged forcibly against the wheel of a coal-waggon, on the 24th December, 1831, at nine o'clock, A. M. Eight hours after the accident he was admitted into the Infirmary, when the tibia was found obliquely fractured a little below its middle, and the upper end of the bone protruding through a large lacerated opening towards the inner side. The surrounding soft parts were ecchymosed, tumid and painful; and it was found impossible, by the introduction of a suture, and the application of adhesive plaster, compress, &c., to bring the edges of the wound in contact, so as to cover the fractured bone. On the 28th, four days after admission, it became necessary, on account of profuse discharge and smart febrile excitement, to remove the dressings. The wound was suppurating, but the adjoining parts were neither inflamed nor tumid. Dry lint was applied; and, before the usual apparatus was adjusted, the leg, from near the knee to the ankle, was surrounded posteriorly and laterally by a piece of oil-cloth, which was interposed between the limb and the pillows. This is a simple, but useful addition to the applications usually had recourse to in such cases, and was adopted to prevent the pillows from being imbued with the purulent discharge, and the patient rendered uncomfortable during the two or three weeks which I was anxious should elapse before the dressings were removed. They were allowed to remain, and the leg left undisturbed for twenty-one days. During this time a considerable quantity of pus was discharged along the oil-cloth at the heel, but there was little escaped through the bandages on the front of the leg; the bran pillows were not touched by it, and the fetor was by no means disagreeable. He had occasional attacks of pain in the site of the injury, but these were not urgent, nor was there any febrile excitement present to call for interference. The exposed portion of bone was covered with healthy granulations, cicatrization was going on, and although the leg was nearly coated with pus, it had produced no injury, except here and there a patch of excoriation. A compress, dipped in a solution of the sulphate of zinc, was laid over the wound to moderate the discharge, and the former apparatus re-applied. After the

detachment of two loose portions of bone, which had not been observed at the time of the accident, the wound gradually closed, and, in five weeks from the injury, the tibia was found firmly united.

CASE LXXXVI.—*Compound fracture of the right Tibia—Cure.*—Mrs. C., æt. fifty, fell over a stair while in a state of intoxication, on the evening of January 1st, 1832. When admitted, three hours after, an oblique portion of the upper end of the fractured tibia projected through a large transverse wound, about four inches above the instep. The soft parts were swollen and contused, the hemorrhage trifling, but she was restless and incoherent. The displaced bone was readily reduced, the edges of the wound were approximated, but could not be brought together; stripes of plaster, compress, and a Scultetus' bandage, were applied with oil-cloth, cushioned splints, &c., and she was ordered two grains of opium.

For the first thirty hours there was smart febrile excitement, and she complained of acute pain in the wound. In a few days the bandages became stained, and the pus found its way to the most depending part of the leg, passed along the oil-cloth, and began to ooze at the heel and knee. The dressings were removed for the first time on the 15th, being the fourteenth day from her admission. The wound was clean and granulating, and only a small portion of the tibia exposed. The discharge was not profuse, but she complained much of the fetid smell. On the 21st, six days after the last dressing, a large fluctuating swelling was discovered a little below the knee, which, on removing the bandage, was found to be occasioned by a collection of pus over the anterior surface of the tibia. The dressings were removed for the second time, a pledget of lint, moistened with a solution of the sulphate of zinc, was applied, and the limb secured in the ordinary method. After this time the discharge was less abundant, the dressings were seldom changed, the parts cicatrized gradually, and in due time she was dismissed, cured.

In the last two cases, the injury to the soft parts was so great, that the edges of the wound could not be retained in contact, or adhesion effected; suppuration took place, but this

was prevented from becoming either copious or extensive, by seldom disturbing the limb or removing the dressings. I am convinced, even when adhesion cannot be accomplished, that this practice will often prevent that diffuse cellular and subfascial inflammation which so frequently extends from the wound along the injured limb, and produces destructive suppuration. When this unfortunate occurrence supervenes, it always retards the cure of the injury, is accompanied by high local and constitutional disturbance, and, unless promptly and actively treated, it may either lead to a fatal result, or induce such profuse discharges, as to call for amputation. In all such cases, the daily removal of the dressings is imperatively called for, that the progress of the local inflammation may be watched, and, if possible, arrested by free incisions, leeches, and cold lotions; the use of poultices, or other relaxing applications, being generally pernicious.

British surgeons are in general too anxious to follow the advice of Pott, and renew the dressings daily in compound fractures, even when the discharge is comparatively trifling. Many of them seem to entertain a morbid aversion to the retention, over an injury of this kind, of any portion of the dressings stained with pus; but they seldom appear to keep sufficiently in view, the injurious consequences to the wound in the soft parts, as well as to the fracture, which such repeated and unnecessary disturbance must produce. It is quite impossible, if the dressings are to be removed daily, however carefully this may be done, to avoid moving the fractured bone, and thus producing pain and irritation, and interfering with that quietude of the limb, which is so essential to the speedy and complete reparation of the injured parts.

When the soft parts are much lacerated, and adhesion cannot be effected, the wound is apt to become sloughy, and give rise to secondary hemorrhage, diffuse inflammation of the cellular texture, and high irritation, or typhoid fever. In the following case, this combination existed, and proved fatal:—

CASE LXXXVII.—*Compound fracture of the right Tibia—Secondary hemorrhage, and diffuse inflammation of the cellular*

texture—Death.—W. P., admitted 27th June, 1826, on account of a compound fracture of the right leg, three inches above the ankle. The injury was occasioned by the falling of a quantity of building materials on the limb. The integuments on front of the leg were lacerated to the extent of two inches, through which an oblique portion of the upper shaft of the tibia protruded; the fibula was also fractured, as were one or two of the metatarsal bones. The pulsation of the anterior and posterior tibial arteries, was readily distinguished at the ankle; the limb was therefore put up in the usual manner, and laid on its outer side. A few hours after his admission, smart febrile excitement took place, and continued for several days, requiring blood-letting, purgatives, diaphoretics, and opiates. The dorsum of the foot was swollen and painful, and, on removing the bandage, it was found red and vesicated; these were speedily removed by leeches and a cold lotion. At the same time he complained of pain over the tibia, a little below the knee, which was subdued by the same treatment. On the eighth day, hemorrhage took place from the wound to the amount of ten ounces, which was checked by the application of a tourniquet. At a consultation immediately after this occurrence, the splints and bandage were removed, and the wound found sloughy, and covered with clotted blood. A splint was applied to the outer, and another to the inner side of the leg, and retained by two stripes of bandage,—the displacement of the bones being prevented without producing unnecessary pressure. The front of the limb was thus exposed, and the wound covered with a pledget of lint, dipped in camphorated oil. The pulse was one hundred and thirty, feeble; the countenance pale and anxious, and the skin cold; but in half an hour this state of collapse, produced by the loss of blood and the alarm which it excited, was got rid of; the pulse continued as frequent, but became full and jerking; the skin hot and dry, the tongue parched, the thirst urgent, and the breathing accelerated, with tendency to rigor. It was not thought advisable to disturb the sloughy cake which covered the front of the tibia, to ascertain and secure the vessel from which the bleeding proceeded. The leg was swollen to more than twice its natural size, and had that boggy feel, so charac-

teristic of extensive destruction of the cellular tissue. Free incisions were had recourse to, and the affected parts covered with an evaporating lotion. He had other three attacks of hemorrhage, but the quantity of blood lost did not exceed six ounces; the febrile excitement increased, and became typhoid; the strength declined rapidly, and he died on the twelfth day from the receipt of the injury. On inspection, it was ascertained that the hemorrhage had proceeded from the posterior tibial artery opposite the fracture; the wound was sloughy, as was the subcutaneous and inter-muscular cellular tissue through the whole leg. There was slight serous effusion under the arachnoid and into the ventricles of the brain, and a few tubercles in the upper lobe of the left lung.

The fatal termination of this case was to be attributed, not so much to the attacks of hemorrhage, as to the diffuse inflammation of the cellular texture, and the typhoid symptoms with which it was accompanied. Had the bleeding occurred soon after the injury, there could have been no hesitation as to the propriety of immediately securing the wounded vessel; but it did not take place till the eighth day, when the gangrenous state of the wound rendered an attempt of this kind altogether unjustifiable. There still remained, however, two modes of procedure which might have been adopted. The first consisted in tying the artery from which the hemorrhage proceeded, at some distance from the wound; and the second, in amputation of the limb.

When a limb is extensively inflamed, swollen, and puffy, which frequently happens in the course of eight or ten days after the receipt of such injuries, it becomes difficult to secure the artery; the usual land-marks by which we are guided are obscured, a greater extent and depth of incision is required, and that too, in an unhealthy part. If gangrene be impending, the result of this operation will generally prove unsuccessful. I have seen one case, in which the anterior tibial artery was tied three inches above the fracture, for profuse hemorrhage on the eleventh day, and where gangrene supervened, and the patient died. The comparatively trifling amount of the hemorrhage in the case last detailed, and the fact, that the alarming state of the patient did not depend so

much on the loss of blood as on the diffuse inflammation of the leg, and the high constitutional excitement which it produced, were the reasons which induced me to defer securing the bleeding-vessel by ligature.

The propriety of amputation was also the subject of consideration. Here the question naturally presented itself,—under what circumstances are we justifiable in adopting this violent measure, on account of secondary hemorrhage from a compound fracture? Should it be found impracticable, from the sloughy state of the wound, to secure the bleeding mouth of the vessel; or should the inflamed and swollen state of the limb, and the extensive destruction of its cellular tissue, be such as to prevent a ligature from being applied to the affected vessel, at some distance from the injury; or should the hemorrhage recur from the activity of the collateral circulation after this had been performed, we should then be warranted in having recourse to amputation. This was not, however, thought advisable in the last case; because, from the typhoid character of the symptoms, and the alarming state of irritability and exhaustion which existed, we had reason to dread that the shock of the operation, and the loss of blood which must have attended it, would prove speedily destructive.

When the injury is followed by profuse hemorrhage, and the ensuing collapse is so severe and protracted, as to prevent amputation from being immediately had recourse to, the subsequent reaction, when it does take place, is often unusually violent, and is apt, if not subdued, or at least greatly moderated, to interfere with the healing of the stump, and end fatally, by the formation of purulent depôts in some of the thoracic, or abdominal viscera.

Case LXXXVIII.—*Compound comminuted fracture of the left Tibia followed by profuse hemorrhage and collapse—Primary amputation—Death.*—T. D., aged forty-three years, was struck on the outside of the left leg by a heavy stone, while engaged in taking down the walls of St. Enoch's church. The accident happened at seven o'clock, A. M., on the 10th March, 1827; and at eight, when he was admitted into the Infirmary,

he was pale, cold, and somewhat insensible; his pulse was feeble and intermitting, and he vomited occasionally. On the inner side of the left leg, there were two large transverse lacerated wounds, the one two inches above, and the other immediately below, the malleolus. Through the former of these, the upper end of the tibia, which was obliquely fractured and comminuted, projected for one and a half inches. A large triangular flap of integuments was detached from the lower third of the leg on its outer side, where the fibula was laid bare, and broken into small, detached fragments; and besides the severe contusion of the soft parts, the finger could be easily passed into the ankle-joint. He was said to have lost more than two pounds of arterial blood; but, before his admission, the hemorrhage had nearly ceased.

A consultation was immediately called, when it was determined to amputate so soon as the patient had rallied a little from the shock of the injury. In consequence of my absence from town, I had not an opportunity of seeing him till one, P. M., the usual hour of visit, when I at once proceeded to amputate below the knee, although reaction was not fairly established. Not more than six ounces of blood were lost, and only four arteries required a ligature. While on the table, he was almost in a state of syncope, which continued for nearly three hours, and was succeeded by high vascular excitement. After this, a considerable oozing of blood was observed at the lower angle of the stump, which continued during the night, but appeared to be checked by the free application of cold water. It returned on the morning of the 11th, but was again arrested before the hour of visit. I removed the dressings, however, because the swelled state, and doughy feel of the stump, showed that a quantity of coagulated blood was accumulated. Three small vessels were tied, but there still continued a general oozing of blood from nearly the whole face of the stump, which could be restrained only by pressure and cold. It seemed as if the tone of the vessels was destroyed, and that they had lost that contractile power they are known to possess in health, and which assists so materially in checking hemorrhage when they are divided.

12th.—Has a languid and exhausted appearance, and is

extremely restless and irritable. Complains of pain in stump, from which there still continues an oozing of blood. Pulse one hundred and twenty, feeble; skin dry and hot; tongue white, but moist; bowels free.—*Sum. Aq. Acetat. Ammon. dr.* iv. *3tia, q. q. hora—Cras mane Ol. Ricini, dr.* vi.

13th.—Blood continued to drop from the lower angle of stump till seven o'clock last night, when it was checked. Complains of urgent thirst, nausea, and occasional vomiting. One scanty stool from oil.—*Habt. Enema domestic. stat. et Haust. Anodyn. Vespere.*

17th.—Stump undressed for the second time. No adhesions; suppuration profuse; three of the ligatures have separated; debility and constitutional irritation increasing.

On the 18th, an hour before the visit, hemorrhage again took place, apparently in consequence of the premature detachment of the ligatures, occasioned by the copious suppuration. When the dressings were removed, and a clot turned out, the bleeding was observed to proceed from several points; but attempts to secure these by ligature failed, from the soft and sloughy state of the parts; a piece of lint dipped in Ol. Terebinth. was introduced, and firm pressure applied. At this time, not more than four ounces of blood were lost, yet its evil consequences were soon apparent in increased weakness and irritability; the suppuration became more profuse, and extended around the knee; and the surface of the stump assumed a pale, glassy appearance. An abscess formed above the knee, and extended along the inner side of the thigh to near the groin; and notwithstanding the free use of wine, brandy, quina, opium, carbonate of ammonia and musk, he sunk rapidly, and after having been annoyed with incessant vomiting, hiccup, and diarrhœa, he died on the 2d of April, at four, A. M.

On inspection, besides the morbid appearances to be expected in the stump and thigh, the saphena and femoral veins were thickened, and patches of a bright red colour were observed on their inner surface, but they contained neither coagula nor depositions of lymph. The upper lobe of both lungs was hepatized; in the substance of the right, there were two purulent depôts, each about the size of a walnut; and in

the left, the pus was collected in an irregular cavity, which could contain a hen's egg; the surrounding pulmonary tissue being darker coloured than natural, and much softened. These appearances were quite unexpected, there having been neither pain, cough, nor dyspnœa present, to give rise to the slightest suspicion of any thoracic affection.

It is now generally acknowledged, that the sooner amputation is performed after the infliction of the injury, the greater is the chance of the patient's recovery. It is proper, however, to delay, should the shock have produced any very decided symptoms of collapse and depression: these usually subside in two or three hours, but they may continue in a less degree for a much longer period; during which, farther delay is more apt to prove injurious than an immediate operation. In the last case, the patient had lost a large quantity of blood, which, with the shock of the injury, and the alarm produced by it, engendered the usual appearances of collapse. These were but little subdued, and were almost as prominent and well marked after six hours had elapsed, as they were on admission: amputation might, therefore, have been performed as safely and effectually at the latter period, as it was at the former, nothing having been gained by delay; while, on the contrary, danger was incurred by subjecting the patient to continued and painful irritation, from an extensive and complicated injury. It is to this cause I would attribute the excessive irritability and excitement which immediately succeeded amputation, and which ultimately led to repeated attacks of secondary hemorrhage, profuse suppuration of the stump, and the formation of purulent depôts in the lungs.

In contused or lacerated wounds of the foot, especially when the injury is severe and extensive, the inflammation of the adjoining tendinous and aponeurotic parts, is apt to end in destructive suppuration, and require amputation.

Case LXXXIX.—*Compound fracture of the Toes—Amputation at the Metatarso-phalangeal articulations—Profuse Suppuration of the Foot—Amputation below the Knee—Cure.*—B. G., aged thirty-six, was admitted into the Infirmary at

eight o'clock, P. M., on the 12th November, 1826. About three hours previously, while engaged in the hold of a vessel at the Broomielaw, a large puncheon of whisky rolled from the deck, and struck him on the right foot. The toes were lacerated, the phalanges fractured, and they were only connected with the foot by the tendons. The dorsum of the foot was swollen and tense, but no fracture of any of the metatarsal bones could be detected. He was cold, pale, and had a feeble pulse,—apparently from the shock of the injury, but really from the evaporation of the spirits, with which his clothes were drenched by the bursting of the cask.

The toes were amputated; but, from the lacerated state of the integuments, a flap could not be procured to cover the wound. On the 18th, when the dressings were removed, the exposed parts were clean, the swelling of the foot was lessened, and the febrile excitement moderate. From the 25th of November till the 7th of December, the local inflammation and symptomatic fever became gradually more urgent. On the 8th, he had a smart rigor, followed by increased febrile excitement, and profuse perspiration; and in the evening, he was seized with convulsions.* The dorsum of the foot being swollen, tense, and painful, a free incision was made into it, and pus discharged. On the 16th, an incision was made over the front of the ankle, and another on the 23d, along the inner edge of the foot; and from both, there was a profuse discharge of pus. It was then ascertained, on grasping the foot, that nearly all the metatarsal bones were fractured, and several of them denuded of periosteum; and as his strength was greatly exhausted, and hectic fever present, it was determined to amputate the leg. This was performed below the knee on the 25th, and for several days after there was high febrile excitement; the pulse varying from one hundred and twenty-four to one hundred and forty: there was troublesome diarrhœa, and nocturnal perspirations; the tongue was dry and florid, and the countenance sunk. On the 13th of January, he complained of acute pain in the right hypochondrium, ag-

* I have seen more than one case, in which whitlow, combined with subfascial inflammation of the palm of the hand, has induced convulsions.

gravated by pressure and motion; his stools were dark-coloured, and his eyes and skin jaundiced. Leeches and a blister removed the acute symptoms; he was greatly benefited by a slight mercurial course; and, on the 10th of February, he was dismissed, cured.

Had the existence of fracture of the metatarsal bones been ascertained immediately after the injury, and amputation performed at their articulation with the tarsus, the subsequent destructive suppuration might have been prevented, and a second amputation rendered unnecessary. In such injuries, however, the bones are seldom displaced, but retain their natural position; and admit of such limited motion, that fracture can rarely be detected when there is much swelling and tension of the surrounding soft parts. But when their natural attachments are destroyed by extensive suppuration, they become so loose, that the nature of the injury is rendered sufficiently apparent.

It was proposed, instead of amputating the leg, to perform Chopart's operation, and remove the diseased parts at the articulation of the astragalus and calcaneum, with the scaphoid and cuboid bones. To this proposal I decidedly objected, as, from the puffy swelling over the tarsal bones and around the ankle, the extensive suppuration, and the depth to which the probe could be passed, and rough bone detected, it was impossible to calculate on the complete removal of the injured and diseased parts. The propriety of this decision was evident on inspecting the limb. Three of the metatarsal bones were fractured, denuded of periosteum, and completely imbedded in pus; the bones of the tarsus were loose,—their ligaments being destroyed, and their articulating cartilages ulcerated; the ankle-joint contained a sero-purulent fluid, and the cartilaginous covering of the tibia and astragalus was softened, and partially ulcerated.

The extensive nature of the injury, the youth of the patient, and the formidable operation that was required, render the following case not unworthy of being recorded:—

CASE XC.—*Compound fracture of the left Femur—Successful*

amputation at the hip-joint.—E. K.,* two years of age, was admitted about eleven o'clock of the forenoon of 6th July, 1831, on account of a compound fracture of the left femur, in its upper third, with extensive laceration of the muscles and integuments. This severe injury was produced, an hour and a quarter before, by the wheel of a loaded waggon passing obliquely across the upper part of the thigh. The bone was fractured transversely, a little below the trochanter, and completely denuded of integuments and muscles anteriorly, to within an inch of its condyles. Posteriorly, the soft parts were also dreadfully lacerated and contused, especially at the upper boundary of the popliteal space, where the limb was only retained by a narrow flap of integument and muscle. The femoral artery and vein were torn across, opposite the fracture, but the bleeding was trifling, and consisted only of a slight oozing from the latter vessel and from the lacerated surface. There was also a compound comminuted fracture of all the phalanges of the left little finger.

The child was carried to the hospital from a distance of two miles, the injured limb being extended on a pillow. The countenance was pale and anxious, the pulse rapid and feeble, and the body cold. The usual expedients for exciting reaction were promptly adopted; heat was applied to different parts of the body, and warm wine-negus administered. A consultation was immediately called, and I saw her for the first time at a quarter to twelve. She still lay in a state of collapse, but was quite sensible, and cried bitterly when the limb was examined.

From the nature and extent of the injury, it was sufficiently evident that the child's life could only be preserved by amputation at the hip-joint. This operation I was anxious at once to perform, but from the absence of my colleagues it had to be delayed, and a second consultation summoned at one o'clock. At this hour I was favoured with the presence and assistance of my friend, Dr. Perry, with whose concurrence I immediately proceeded to the operation.

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* This case has been already published in the London Medical Gazette of 19th November, 1831.

An outer and an inner flap were formed by transfixing the limb with Lisfranc's knife, which was passed so closely around the head of the femur as completely to divide all its muscular coverings; the capsular ligament was opened with a scalpel, the bone disarticulated, and the limb removed; the femoral artery was effectually compressed by an assistant, and not more than six drachms of blood were lost; five vessels were secured by ligature, after which the flaps were brought together, and retained in apposition by adhesive plaster, compress, and bandage.

During the operation the child was exceedingly weak, and before the wound could be dressed it was in a state of syncope, and appeared to be dying; the pulse at the wrist was imperceptible, and it was even with difficulty the pulsations of the femoral artery in the wound could be discovered; the face was deadly pale, and covered by clammy perspiration; the body cold; the eyes fixed in their sockets; the pupils dilated; and the breathing hurried, interrupted, and laborious. Stimulants were freely administered, and the child was removed to bed, having been about twenty minutes on the table. She lay in a state of collapse and insensibility till seven, P.M., when, after vomiting once or twice, reaction was gradually established. At eight, the stimulants were discontinued; the pulse was one hundred and thirty; skin hot and dry; the fractured finger was now removed, and a poultice applied.—*Ol. Ricini, dr. ij. et post hor. duas Enema domestic.—Mistur. Diaphor. c. Vin. Antimon. 3tia q. q. hor.*

7th.—The child is not weaned, and has been sucking freely; was much annoyed with startings during the night; pulse one hundred and forty; skin hot and dry; respiration hurried; no oozing from wound.—*Submur. Hydr. gr. ij. et rept. post hor. quatuor.—Contin. Mistur.*

Half-past seven, P.M.—Has been in a drowsy state since two o'clock, from which she can with difficulty be roused; eyes clear and sensible to light; pupils contracted; increased heat of skin, and flushing of face; troublesome startings; pulse one hundred and sixty, feeble; no stool.—*Enema domestic.—Abrad. Capill.—Bladder with iced water to head.—Contin. alia.*

8th.—Is more alert, and answers questions readily; respira-

tion still hurried, and there is mucous râle in trachea; pulse one hundred and sixty; bowels free.

9th.—Had rather a quiet night, with less starting; tongue cleaner. On undressing wound, flaps were found adhering throughout, except a small portion at upper angle, which is sloughy.—*Omit. Medic.—Four ounces beef-tea.*

11th.—Pulse still very rapid, but febrile excitement diminishing. Edges of wound clean; granulations pale.—*Vin. Rubri. oz. j. in dies.*

13th.—Was more restless last night, and is troubled with cough, dyspnœa, and occasional vomiting. Mucous râle is heard over the whole thoracic parietes. Countenance rather sunk; frequently refuses the breast; pulse very rapid and weak.—*Mistur. Mucilag. c. Træ. Opii.—Calomel, gr. ij. 4ta q. q. hor.—Contin. Vin.*

Without continuing the diurnal reports, I may shortly state, that the symptoms of bronchitis continued rather urgent till the 19th, when they began gradually to diminish. From the 22d till the 6th of August, although the wound continued steadily to heal, there existed a good deal of irritability of the bowels, accompanied by diarrhœa, and an aphthous state of the mouth. During this period, three molar teeth cut the gum, and ultimately gave relief to the symptoms. The wound gradually healed; the child improved daily in strength and spirits, and was dismissed, cured, on the 13th of August.

There were several points in the history and progress of this case, which rendered the prospect of its ultimate success extremely problematical. The extensive nature of the injury, and the alarming collapse which it produced, might have reasonably deterred almost any surgeon from undertaking, in circumstances so apparently hopeless, the performance of so severe and formidable an operation as that of amputation at the hip-joint. On first examining the injured limb, I was induced to view the case as almost, if not altogether, hopeless. It was only, however, by amputation that the child's life could be preserved; and although I was aware that this operation might, in a subject so young, and already so much sunk by the shock of the injury, be productive of immediately fatal consequences, I considered that I should have failed in my duty, had I not

recommended and adopted it. I regretted at the time the delay that took place in obtaining a consultation. The child was in a more favourable state for amputation at eleven than at one; and had it been performed two hours sooner, I am convinced that the shock to the nervous system would have been lessened by its nearer approximation to, and by its becoming in some measure blended with, the shock of the injury. It was evident that the collapse which existed before, and for about five hours and a half after amputation, was not occasioned by loss of blood, but depended on the depressed condition of the nervous system, produced by the injury and aggravated by the operation. With the view of lessening as much as possible the injurious effects of the operation upon the nervous system, I was anxious to perform it rapidly, and with little loss of blood. Both these objects were in part attained. The formation of the flaps, disarticulation of the femur, and removal of the limb, did not occupy a minute and a half, and not more than six drachms of blood were lost. I am no advocate for the hurried performance of operations: nevertheless it must be admitted, that when the pain and irritation of a tedious and protracted operation come to tell, as they must do, injuriously on a constitution which has already sustained a violent shock, the most serious consequences may be anticipated; and we are certainly warranted, in such circumstances, in expediting the operation as much as is consistent with its safe and efficient performance.

The youth of the child was also inimical to the success of the operation. The physical irritability which exists during the two or three first years of childhood is so great, as to render the performance of any capital operation extremely dangerous. I am not aware that there is any case on record, in which amputation of the femur at the cotyloid cavity has been performed on so young a subject; and I have been chiefly induced to communicate this case to the profession, in order to show, that in serious injuries inflicted on young children, we ought not altogether to despair of success, even in the most desperate circumstances, but proceed with those operative measures which the peculiarities of the injury may demand. I must state, however, that I have witnessed amputation of the hand twice on children under three years of age, and in both cases convul-

sions supervened, and proved fatal in less than twenty-four hours. We would not willingly select such cases for operation, neither should we decline to use the knife when it is absolutely called for.

We had not only the immediate dangers of the operation to deal with in this case, but we had also to contend with a series of untoward occurrences during the progress of the cure. 1st, The collapse was unusually severe and protracted; and, as generally happens, was productive of excessive excitement. 2d, The continuance of this febrile excitement, for eighteen hours, produced an affection of the brain, accompanied by partial coma. 3d, The occurrence of bronchitis, which was rather protracted and severe, was another source of danger. And, 4th, The existence of troublesome diarrhœa, with dentition. The child not having been weaned, was, I think, also detrimental to its recovery. The continued anxiety of the mother, her absence from her family, and her close confinement in the hospital, occasioned a continued diminution, and, occasionally, an almost complete suspension of the secretion of milk; and as the child refused spoon-meat of all kinds, it must be obvious that she was often but imperfectly nourished.

Since she was dismissed from the Infirmary, she has completely regained her health and strength, and she is now able to move about the house with the aid of crutches.*

Case XCI.—*Compound comminuted fracture of the left Femur—Simple fracture of the left Radius—Luxation of the distal end of the right Radius—Gangrene—Death.*—W. G., æt. fifteen, admitted May 28th, 1831. About seven hours previously he fell down the shaft of a coal-mine, and struck against the iron bar of a lamp, at a depth of thirty-six feet. The left radius was fractured close to its styloid process, and the right radius luxated at the wrist-joint. There was a compound comminuted fracture of the left femur in its upper

* Since November last, when the above report was written, this child has continued to improve still farther. She is now in robust health, and can walk several miles by means of crutches. To-day (2d June, 1832,) she accompanied her mother to my house, when I was gratified on observing the great improvement in her strength and appearance which a few months had produced.

third, the wound of the integuments being on the outer part of the thigh, and two and a half inches in extent. Through this opening a portion of muscle protruded, as also a loose splinter from the shaft of the femur, which, on being removed, measured two inches in length, and one in breadth. On introducing the finger, the broken ends of the bone were found riding over each other, to the extent of three inches. The surrounding soft parts were a good deal bruised, but no arterial branch of importance appeared to be injured. The edges of the wound were approximated by sutures and adhesive plaster, and the thigh put up with splints in the straight position; lateral splints were applied to the fractured radius, and the right arm was surrounded by a bandage after the bone was reduced.—*R. Calomel. gr.* v. *Tart. Antimon. gr.* ¼ *Pulv. Opii. grss. M. sit pulv. hor. som. sum.—Cras mane sum. Sulph. Magnes. dr.* iv.

On the 29th, the febrile excitement was high; and, as he was incoherent, his head was shaved and cold applied; the bowels were also freely opened by a stimulating enema. He was in a state of maniacal delirium on the morning of the 30th, and the pulsations of the carotids were full, throbbing, and one hundred and thirty in the minute. He was bled from the temporal artery to 12 ounces. Soon after this, the integuments of the left groin assumed a dusky red appearance, and there was slight emphysema along that side of the abdomen; the splints and bandages were removed; the wound was sloughy, and gave exit, on pressure, to a sanious fluid mixed with air; and the integuments of the upper third of the thigh, groin, and lower part of the abdomen, were in a state of incipient gangrene. Notwithstanding the liberal use of stimulants, he gradually sunk, and died at eight o'clock, P. M., about sixty-one hours after the injury.

On dissection, there was found universal emphysema of the superficial cellular texture; extravasation of blood under the scalp over the left temple; a softened and pale state of the brain, with globules of air in the sinuses; four ounces of bloody fluid in each thoracic cavity; congestion of the lungs and of the costal pleura; a deep red colour of the thoracic portion of the sympathetic; an effusion of a sero-sanguinolent fluid, with air, into the pericardium; a soft and flabby state

of the heart, which was also emphysematous. The liver was greatly enlarged, soft, and dark-coloured; the spleen soft, the kidneys natural, and the renal capsules emphysematous. The abdominal muscles on the left side were dark-coloured and easily torn, as were those of the outer and upper part of the thigh. In these places the cellular tissue was broken down, and infiltrated with venous blood. The fractured ends of the femur were shattered, denuded for two inches, and surrounded by a dark sloughy cavity, which extended into the substance of the crureus and vastus externus muscles. The cellular texture and muscles below the wound were perfectly healthy; the anterior crural nerve, and the semilunar ganglion of the sympathetic, were of a deep red colour.

These morbid appearances were rather interesting. Besides the cellular texture, which was as completely emphysematous, as if the air had escaped into it from an injured lung, the same change was found to have taken place in the large veins, sinuses, and internal organs. In the former situation, the air was probably secreted by the vessels of the gangrenous parts, and diffused rapidly and extensively over the body; its occurrence in the internal organs must, however, be attributed to the putrefactive changes consequent on death. The functions of the sensorium may be disturbed, and high delirium excited, when there exists a diminished state of the circulation in the brain, as well as when it is over-excited. When the system receives a violent shock from a compound fracture, or other injury, it tells immediately on the brain; but after re-action is established, the extremities of the nerves in the vicinity of the injury often become inflamed, and in this way a degree of morbid excitement is propagated through various intermediate channels back to the brain, where, by disturbing the function of the part, it may again operate injuriously, and give rise to a train of unmanageable and dangerous symptoms.

There are cases, by no means unfrequent in their occurrence, in which, from the situation and extent of the fracture, we can easily perceive that life cannot be preserved, except by the immediate and complete removal of the injured part. There are other cases again, where the propriety of amputation is exceedingly doubtful, and we have difficulty in determining, whether, on account of the nature of the injury, or the de-

structive effects on the system which the subsequent reparatory process may produce, an immediate operation be absolutely called for or not. In the case last detailed, the injury of the thigh was not so great, as to authorize the performance of primary amputation. I had not an opportunity of seeing this boy for several hours after his admission, and then, as the limb was dressed, and the usual fracture-apparatus applied, I could not satisfy myself, by personal examination, of the actual condition of the injured parts. The accurate information, however, which I received from my clerk, Mr. Alex. Ure, convinced me, that had I been present I should at once have dressed the wound, and attempted to preserve the limb. The wound was small, and situated in the outer part of the thigh; the muscles and integuments were not very severely injured; the femoral artery was entire, which, along with the youth of the patient, showed that primary amputation was not necessary.

When gangrene follows a compound fracture, it may either originate in the injured part, or in the extremity of the limb. The contusion or laceration may be so great as to enfeeble the vitality of the injured parts, and render them unable to sustain the inflammation which is usually excited; or should the circulation through the main arterial branches be either destroyed, or so much impeded as to prevent an adequate supply of blood, then the gangrene will commence at the extremity of the limb, and proceed upwards. In either case, the disease spreads with great rapidity, and, as has been seen, it may, by extending to the abdomen, prevent amputation from being adopted, and prove destructive to life in a very few hours.

There are few points in surgery which present a more interesting and inviting field for investigation, than those which regard the subject of amputation during the progress of traumatic gangrene. Until lately, it was laid down, and almost universally received as an axiom, that amputation was totally inadmissible till the progress of the disease had been arrested, and a distinct line of separation established between the dead and living parts; and that, without the slightest

reference to its origin, whether this might be from local or constitutional causes. Since the year 1796, when the propriety of this assertion was disputed by Larrey, and put to the test of experience, we find many distinguished surgeons who are now convinced, that in traumatic gangrene, and that following the ligature of a main artery, for the cure of aneurism, amputation may be safely and successfully performed while the disease is in progress, without waiting for the expected line of separation. The French and British army and navy surgeons have been enabled, during the late sanguinary and protracted wars, to accumulate a body of evidence in its favour, which seems to be, in many respects, conclusive and satisfactory. Larrey, Hutchison, Hennen, Lawrence, and, with some modifications, Guthrie, may be considered as the chief supporters of this doctrine, while it is decidedly opposed by Boyer, Thomson, and others. I have only met with one case of traumatic gangrene, in which amputation during the progress of the disease appeared to be justifiable. It occurred in private practice, and was seen by the late Dr. George Monteath, and several of my professional friends.

Case XCII.—*Compound fracture of the Tibia—Rapid gangrene of the Limb—Amputation during its progress—Cure.*—P. G., a stout healthy man, about forty-nine years of age, fell from a height of two stories, and had his right leg fractured, while engaged in superintending the erection of a scaffold, at a public work in Hutchesontown, on Monday, the 12th April, 1824. Half an hour after the accident, when I first saw him, he was in a state of tremor and exhaustion, his pulse was hardly perceptible, his skin was cold, and his countenance blanched. The right tibia and fibula were fractured about three inches above the ankle, and the former bone projected through a large ragged opening, which extended more than half way around the limb. The finger was passed into a large cavity, and comminuted portions of both bones discovered; the soft parts were dreadfully contused, and there was no pulsation perceptible in either the anterior or posterior tibial arteries, at the wound, or above the ankle.

It was decided, in consultation with Dr. Monteath, that immediate amputation should be performed; but as the patient obstinately refused to submit, the wound was closed, and the limb put up in the straight position. In the evening, the skin was hot and dry, the tongue parched, the thirst urgent, the pulse one hundred and twenty, and sharp; and he complained of acute pain, and startings of the limb. He was bled to sixteen ounces, freely purged with calomel and epsom salts, took small doses of an antimonial diaphoretic, and had the spirit lotion applied to the leg.

On the morning of the 13th, the febrile symptoms had increased; his pulse was one hundred and forty, sharp, but compressible; his countenance sunk and anxious, his stomach irritable, and he complained of burning pain in the wound. He had been occasionally delirious during the night, which, along with excessive restlessness, had completely prevented sleep. On dividing a few folds of the many-tailed bandage, a quantity of thin bloody fluid escaped; the wound was observed to be gangrenous, and the surrounding integuments, for about two inches above and three inches below this part, were slightly livid and cold; the foot and toes were also cold, and had a marbled appearance, but still retained their natural sensibility. Another attempt was made to persuade this patient to submit to amputation, but without success. He was therefore ordered a grain of opium every four hours, with bark, wine, &c., and the camphorated spirit of wine was applied to the wound.

On the 14th, all the symptoms were aggravated; the integuments of the leg, to the knee, were tumid, emphysematous, and of a dark red, or livid appearance; the heat of the upper half of the leg was natural, but the foot and lower half were cold, and completely gangrenous; the pulse was small and rapid, the strength greatly sunk, and there were present incessant jactitation, vomiting, and hiccup. He was now as eager for an operation as he was formerly determined against it; and, after a second consultation with Dr. Monteath, I immediately proceeded to amputate above the knee—being about forty-eight hours from the receipt of the injury. The subcutaneous cellular texture on the inner side of the thigh was loaded with air, but it was otherwise healthy, as were the other soft parts forming the stump. Only four arteries required a ligature.

For several days the febrile excitement continued high, but there was a complete cessation of the delirium, vomiting, and hiccup. The stump did not adhere, but inflamed and suppurated; there was, however, no appearance of gangrene; healthy granulations formed, the strength continued to improve, and in rather more than a month a complete cure was accomplished.

This case shows the safety of performing amputation during the progress of traumatic gangrene, when this is the consequence of a severe local injury, and occurs in a sound and healthy individual. It would be incorrect and dangerous, however, were we to maintain that amputation was proper and admissible in every case of gangrene arising from this cause. Should it result from a slight and uncomplicated injury, we have reason to believe that there is either some general tendency to the disease, or some other morbid condition of the system, which shows that it depends more on the constitutional disposition than on the local cause. Under such circumstances, no surgeon would be warranted in amputating the limb, till there existed a complete line of separation between the dead and living parts. In one case, in which the local injury was comparatively trifling, and quite inadequate to account for the gangrene that ensued, I witnessed the unfortunate result of amputation, performed while the disease was extending. In a few days the same destructive action was manifested in the stump, and proved speedily fatal. In the LXXX. Case, gangrene is seen to have followed a simple fracture of the leg, in a worn-out debauchee; and in another, which I shall afterwards detail, the gangrene was produced by a simple fracture of the radius and ulna, in an emaciated and dissipated woman, and proved fatal by the supervention of tetanus. In neither of these did I consider it to be a safe or commendable practice to have recourse to amputation, before the dead parts were distinctly separated from the living by a line of ulceration.

In mortification from purely constitutional causes, the line of separation must not only have commenced before amputation be had recourse to, but it must have extended through the whole depth of the soft parts to the bone, otherwise a return of the disease in the stump may be expected. The neglect of this fact, in the following case, was productive of fatal consequences.

Case XCIII.—*Gangrene of the right foot and leg after fever —Amputation of the thigh followed by a return of the disease in the stump—Death.*—A. C., æt. thirty-two, was admitted on the 10th of March, 1827, when the right foot and leg, as far up as about three inches below the knee, were of a dark livid colour, cold, and void of sensibility. There was a large purple-coloured vesicle over the dorsum of the foot, and the toes were dry and shrivelled, whilst the leg had a boggy and emphysematous feel. At the upper part, there was a white vesicated line of commencing separation between the sound and gangrenous parts; and when a portion of this was removed, the process of ulceration was found to have extended about the sixth part of an inch into the subjacent soft parts. The pulse was one hundred and forty, and sharp; the tongue typhoid, and the strength greatly impaired.

Five weeks previously, was affected with typhus fever; and three weeks after, without any evident cause, experienced a sensation of coldness and numbness in the right heel, which gradually increased, and was followed by pain and discoloration of the foot and ankle. After the application of twelve leeches, the coldness increased, the integuments assumed a livid appearance, and the disease extended along the leg, till six days ago, when it became stationary. He was ordered *Sulph. Quinæ gr.* iij. *Opii. gr.* i. *in form. pil. 4ta. q. q. hora.* An ounce of wine every hour, with London porter, for his ordinary drink; and the limb was covered with pledgets moistened with the camphorated spirit of wine, its evaporation being prevented by the application of oiled silk.

On the 11th, but little change was observable in the state of the disease. A slight dusky-redness had extended to the knee, and there was pain on pressure along the inner hamstring, but without swelling or discoloration. It was agreed at a consultation, that amputation should be performed above the knee. To this proposal I decidedly objected, because the cessation of the gangrene was not yet sufficiently marked, nor was there such a complete and deep line of demarcation between the sound and unsound parts, as to warrant this operation. The limb was removed, however, by the double flap operation, about four inches above the knee. The muscles at

the lower angle of the stump were dark-coloured, and unusually soft; and the blood from the arteries was thick, and of a claret colour.

The limb was injected with wax, and carefully dissected. The subcutaneous and intermuscular cellular substance was gangrenous, broken down, and loaded with a brownish-coloured fluid, which had a fetid smell, and was mixed with air. About two ounces of this matter was found between the heads of the gastrocnemius and soleus muscles; and the muscles of the leg, as well as the cellular tissue, were gangrenous to a considerable distance above the line of separation formed in the skin. The tendons and ligaments of the foot were unchanged, and the anterior and posterior tibial arteries were sound, and filled with wax as far as the ankle.

12th.—Slept a little during the night, but awoke generally in starts; slight oozing from lower angle of stump; pulse one hundred and fifty, and occasionally intermittent; skin dry and harsh; no stool.—*Ol. Ricini, st. et post. alv. bene flux. Aq. Acet. Am. 3tia. q. q. hor.*

14th.—Was delirious during the night, but became calmer, and had some sleep after taking two grains of opium. Pulse one hundred and fifty-six; skin moist; tongue and teeth covered with sordes; bowels loose; has subsultus tendinum; ordered *wine, opium, and brandy.*

15th.—There was an increase of the restlessness and delirium during the night, and his countenance has now a more sunk and typhoid appearance. On removing the dressings, a considerable quantity of brownish-coloured and offensive fluid was discharged; the upper half of the flaps appeared to be adhering, but below they were separated, and had an ash-grey appearance; the integuments forming the outer flap were livid and vesicated.

The gangrene gradually extended to the groin, where an irregular whitish line could be traced nearly around the upper part of the thigh. The lower half of the abdominal integuments, from the one iliac bone to the other, was of a yellowish-brown colour, painful, and emphysematous. The thigh became tense and swollen before the lividity made its appearance. He sunk into a state of stupor, and died on the 19th, at four, P. M.,

twenty-three days from the commencement of gangrene, and eight after amputation.

On inspection, the muscles and integuments of the thigh, as high up as Poupart's ligament, were of a dark-red colour, soft, and easily torn, being more completely disorganized than was the leg when amputated. The cellular texture of the abdominal parietes was distended with air; the intestines and peritoneum were natural, as were also the heart and blood-vessels.

It is evident that the gangrene of the foot and leg was preceded by inflammation. It commenced with coldness of the heel, and was soon followed by pain and redness, which gradually extended, and continued for some time before lividity was apparent. The inspection of the limb tended also to corroborate this opinion: it was greatly swollen, compared with the opposite one. The cellular tissue, besides being disorganized, was loaded with a sanguineo-purulent fluid, which, in two places, was collected in distinct cavities.

Complete gangrene of a limb seldom occurs even in the worst and most protracted cases of typhus; but partial sloughing of the nates, and other parts that have been subjected to long-continued pressure, is not unfrequently observed. During the epidemic fever, which prevailed to an alarming extent in this city, in 1818 and 1819, out of nearly a thousand cases of this disease which came under my care, in the district to which I was then attached, gangrene of the extremities took place in only three cases; yet the subjects of this fever were in a very favourable state for the supervention of this secondary affection: they consisted of the poorest of the population; were exposed to every kind of privation; were generally miserably lodged and ill fed; and the treatment of their disease, although strictly attended to, was subjected to the manifold disadvantages, inseparable from the medical management of the sick-poor in their own houses. All the three patients thus affected were advanced in life. The gangrene in one was confined to the foot; the toes separated, and large sloughs were detached; but a cure was ultimately accomplished without amputation. In the other two, the disease gradually extended to the knee, and proved fatal before nature had com-

menced a line of separation. In one of these, arteritis was found to have produced the mortification; the arteries of the affected leg being inflamed, thickened, and plugged with lymph, which was apparently organized, and adhered intimately to the tubes in which it was enclosed. There were also patches of inflammation visible in the aorta, and a few of those steatomatous depositions, which are so frequently met with in advanced life.

ON DISLOCATIONS.

It is but rarely that dislocations, even when productive, as they often are, of extensive contusion and laceration of the surrounding soft parts, require more than a few days' rest, with the occasional use of leeches and cold lotions, before the natural power and mobility of the joint is restored. In the following case, however, this injury was succeeded by acute inflammation of the parts, which produced a secondary, but partial luxation, and temporary lameness.

Case XCIV.—*Dislocation of the right Femur upwards on the dorsum Ilii—Reduction followed by inflammation of the Acetabulum, and secondary Luxation—Cure.*—J. A., aged seventeen, was admitted on the 6th of February, 1827, with a distinct dislocation of the right femur upwards, produced four hours previously by the fall of a large quantity of earth upon the lower part of his body. The dislocation was distinctly marked, and the head of the bone was readily discovered on rotating the thigh inwards. Reduction was easily accomplished by the use of pulleys, after which, the limb retained its natural length, and the toes their usual direction. There was a good deal of puffy swelling and abrasion over the first lumbar vertebra, where pressure was painful; the belly was tumid, and micturition difficult. He was bled to eighteen ounces, and smartly purged, and twenty-four leeches were applied to the back.

For the first eight days, the urgent symptoms were to be referred to the spinal injury. The power of both lower extremities was diminished, but the sensibility of the parts remained entire. After this, he began to complain of pain in the right hip and knee, which was increased on motion of the joint, and especially when the head of the femur was pressed forcibly against the acetabulum. By antiphlogistic treatment and rest, the pain and tumefaction of the hip gradually diminished; the freedom of motion was increased; and I satisfied myself, by repeated examinations, that the head of the femur

was in its natural situation. On the 1st of March, he got out of bed, and walked with the aid of crutches, by which means the articular inflammation was reproduced; the hip-joint became acutely painful, and he could not tolerate pressure behind the trochanter, nor permit the limb to be moved in any direction. As the inflammation advanced, the trochanter became gradually more prominent, apparently from effusion into the acetabulum; he had acute pain in the groin, knee, and along the inside of the thigh; the limb retained its usual length, but the foot was slightly everted, and the head of the femur was evidently raised from its socket; its globular shape being distinctly felt resting on the upper and outer edge of the acetabulum. By cupping, and the use of blisters and moxa, the acute symptoms subsided, and the head of the femur gradually receded from its prominent position; the mobility of the joint increased; and about the beginning of April, when he left the Infirmary, he could walk without lameness.

The following case is interesting, as it shows the distance of time from the occurrence of dislocation, at which reduction may be successfully accomplished:—

Case XCV.—*Dislocation of the Radius and Ulna backwards, at the Elbow-joint—Reduction successful on the seventy-third day.* —A. M'P., æt. twenty-three, admitted on the 25th May, 1831. Two months ago fell down a stair, and received the weight of her body on her right hand; great pain, swelling, and stiffness of the elbow were produced, and it was several days before the nature of the accident was ascertained. Two ineffectual attempts at reduction were made by different surgeons; the one on the fourth, and the other on the thirtieth day from the receipt of the injury. When she entered the Infirmary, the characters of the dislocation of the radius and ulna backwards were exceedingly well marked, and as there was no swelling of the surrounding soft parts, the various prominent processes of the bones were distinctly recognized. The arm was completely extended, and could not be bent, and the fore-arm was in a state between pronation and supination. The radius and ulna were more prominent than natural on the

back-part of the joint,—the former bone being found resting on the posterior surface of the humerus, above the external condyle; the olecranon process of the ulna was placed so much higher up on the arm than natural, that a line drawn from it to the acromion scapulæ, measured one inch and a quarter less than between the corresponding points of the opposite arm. There was also a considerable prominence on the front of the joint, produced by the lower end of the humerus; and here the same diminution of the distance between the inner condyle and the wrist was observed, as between the olecranon and acromion.

She was rather a muscular woman, but as there was no unusual firmness or rigidity about the joint, and as a certain degree of motion was perceptible between the displaced bones and the humerus,* I considered reduction as still practicable. The arm was nearly useless for the employment to which she was accustomed, and she was therefore anxious to submit to any plan by which this inconvenience could be remedied. On the 29th, the shoulder and upper part of the humerus were fixed by an assistant, and extension made by means of a towel applied above the wrist; at the same time an attempt was made to press back the upper ends of the radius and ulna, so as to raise the coronoid process of the latter bone out of the posterior fossa of the humerus, by applying the knee to the upper and anterior part of the fore arm, and making rather forcible attempts to bend the arm. These having failed, the extending power was increased by attaching a pulley to the fore arm, while the proximal end of the humerus was fixed by a strap, from which a cord passed to a staple in the wall. While this was going on, I fixed my knee over the anterior surface of the radius and ulna, immediately below the projecting extremity of the humerus, grasped the wrist, and directed the extension to be made obliquely forwards. The knee was thus used as a fulcrum, and the fore arm as a lever, by which means I expected that the displaced bones might be forced from the irregularities on the posterior surface of the humerus, when, by suddenly relaxing the extension, and immediately bending

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* There was a grating sensation felt on moving the displaced radius and ulna on the humerus, which, on a superficial examination, or while the parts were swollen, might have been mistaken for a fracture.

the arm across the knee, reduction might be accomplished. These attempts failed, after being carried as far as was thought prudent, even until syncope was induced. I also tried, without the slightest advantage, the plan recommended by Sir A. Cooper, which he seems to have found both easy and successful, even "*several weeks*" after the accident, as he vaguely expresses it. By this plan no extending force is used, the knee is merely applied to the inner side of the fore arm, so as to separate the radius and ulna from the humerus, when the arm is bent. In recent cases this method may prove successful, but I am afraid a much more active procedure will be required when the injury is of long standing.

These unsuccessful attempts were followed by some pain and swelling of the elbow and fore arm, which, however, subsided in a few days by the use of a cold lotion. On the 6th of June, she was removed again to the operating theatre, where the attempts at reduction were renewed. It occurred to me, that by completely varying the mode of extension, the chief obstacle to reduction, viz. the difficulty of raising the coronoid process from the humeral fossa, might be more effectually overcome. This attempt was therefore made in the following manner:—The patient was seated on a chair, which was fixed to the floor; several folds of a bandage moistened with cold water were applied around the middle of the arm, and also around the fore arm, immediately below the end of the humerus, and over these broad leather straps were fixed. The one applied to the arm had an iron hook attached to it in front, to which a cord was tied and secured to the wall, in order to produce counter extension, while the one on the fore arm had the hook on the outer side, and was attached to the pulley. The patient was then fixed to the chair, and the arm raised to a right angle with the body. The extension was begun, which of course acted on the upper half of the radius and ulna, and tended to separate these bones from the humerus; at the same time the wrist was grasped by an assistant and kept extended, and, as formerly, I applied my knee to the fore arm, that I might be prepared to flex the arm when the extension had been carried sufficiently far. After it had been continued about five minutes, I ordered the extending force to be suddenly relaxed, when, with the aid of

the assistant who held the wrist, I succeeded in bending the arm. The luxation was thus reduced on the seventy-third day from its occurrence, and the natural shape of the joint completely restored. The arm was retained in a bent position, bandaged, and supported on a splint.

For nearly a month after, the pain of the elbow, especially on motion, was so great as to require the repeated application of leeches, and the constant use of cold lotions. As this symptom was not connected with inflammation or swelling of the surrounding soft parts, it did not appear to me that its extreme severity and obstinacy could be accounted for, except on the supposition, that, during the continuance of the dislocation, part of the cartilaginous covering of the articulating ends of the bone had been absorbed, and inflammation excited. On the fourteenth day, passive motion of the joint was cautiously employed; but, from the acuteness of the pain, this could not be continued longer than two or three minutes, or repeated oftener than once in three days. By a continuance of this cautious procedure, with repeated frictions, the power of moving the joint was in a great measure restored; and, on the 11th of July, she left the Infirmary to resume her usual employment.

I have not been able to find on record any case of this form of luxation, in which reduction was accomplished after so long a period had elapsed from the receipt of the injury. In general, the displaced ends of the radius and ulna, and the projecting extremity of the humerus, soon acquire new and unnatural attachments to the soft parts with which they are surrounded; the extent, firmness, and intimacy of these adhesions, depending a good deal on the severity and duration of the preceding inflammation. These changes are, however, not always confined to the soft parts. On the contrary, the bones gradually come into contact by the absorption of the intervening substance; and by the removal of their outer shell, the cancellated structure is exposed, new bone is deposited, anchylosis produced, and an effectual obstacle to reduction established.* This

* It might be possible, although partial anchylosis had taken place, to destroy the new ossific connexions of the bones, and reduce them; but were this even accomplished, a stiff joint would still be the consequence.

happened in a case detailed by Mr. Lawrence, in his Lectures: the bones became immoveably fixed by anchylosis, so soon as eight weeks after the injury.

When, however, the mobility of the bones is such as not to indicate the existence of incipient anchylosis, we are warranted in attempting reduction, even at the distance of several weeks from the accident. It is impossible to lay down a general rule which can guide us in determining the exact period beyond which such attempts shall prove dangerous. There is, probably, no joint in the body which can become so soon irreducible after the occurrence of dislocation, as that of the elbow. Sir A. Cooper does not mention what was the duration of the oldest case of dislocation of this joint which he had succeeded in reducing, but merely that this may be accomplished "even at the period of several weeks after the accident."* Boyer, who writes the article on Luxations of this joint, in the "Dictionaire des Sciences Medicales,"† says, that twenty days after the injury was the longest period at which he had succeeded in effecting reduction. In his "Traitè des Maladies Chirurgicales,"‡ he seems to extend the time considerably, but still states, that should the accident have existed for a month or six weeks, it will seldom be reducible. Marx, in his excellent paper on Dislocations, details two cases of successful reduction of the elbow-joint; the one on the sixteenth, and the other on the eighteenth day after the injury.§ B. Bell alludes to two cases in which reduction, immediately after the injury, was impracticable; and he states, that in one of these the surgeon, apparently for no other reason than because he was foiled in his attempts, had recourse to immediate amputation.

We ought to recollect, that should our efforts be too violent or long-continued, even when the displaced bones are only retained in their unnatural position by cellular attachments, we may produce a serious injury to the arm. Flaubert relates a case of this form of dislocation, which had existed for

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* Treatise on Dislocations and Fractures of the Joints. 4th edition, p. 432.

† Tome xxix. p. 238.

‡ Tome iv. p. 220.

§ Repertoire Generale, Tome vii. p. 52.

twenty-seven days.* Seven students were employed to extend the arm—the patient was bled, and after extension was cautiously adopted and slowly increased, reduction was effected. At the moment of its accomplishment, a sensation of tearing was recognized at the elbow-joint; and on examination it was found, that extensive laceration of the muscles and other soft parts had taken place, and produced a deep groove around the elbow. This was immediately productive of swelling, which gradually extended along the limb, accompanied with slight fluctuation, but without the pulsation, or "bruit," which might have been expected had any of the arteries been opened. The pulsations of the radial artery were imperceptible for many hours; the hand became cold; the integuments livid; vesications formed; and there was every indication that gangrene had commenced. This, however, did not take place; the circulation was slowly restored, partial suppuration took place in one or two places, and in others the extravasated blood was absorbed. This patient was ultimately seized with a severe pulmonary affection; and before she was dismissed from the Hotel Dieu, the fore arm and fingers had become hard, contracted, and immoveable.

Besides the local injuries which occasionally result from the employment of force in the reduction of old dislocations, I have seen several cases in which severe constitutional symptoms were produced. A man was admitted into the Infirmary with a luxation of the humerus into the axilla, of twenty-one days' duration; the pulleys were applied, and the bone replaced, after making rather forcible efforts for ten minutes. He was put to bed in a state of syncope; reaction did not take place for several hours, when high febrile symptoms appeared, followed by incessant vomiting, and diffuse pain in the epigastrium. These were removed by blood-letting, leeches, and a blister, with calomel and opium, purgative enemata, &c. A robust woman had had the head of the humerus dislocated into the axilla for sixteen days, when she applied for advice at the Infirmary: reduction was accomplished, the necessary exten-

* Repertoire Generale for 1827.

sion having been made by two assistants, without the aid of pulleys. She could not leave the house for several days, on account of a severe and immediate attack of pleuritis, the pain having commenced at the moment of reduction. On the 11th of February, 1832, I made an unsuccessful attempt to reduce a luxation of the thumb, which had existed seven weeks. The patient, who was a robust female, was immediately seized with shivering, smart fever, dyspnœa, and vomiting, which did not subside for several days.

Case XCVI.—*Compound dislocation of the right Ankle—Oblique fracture of the Tibia extending into the joint—Comminuted fracture of the Fibula—Cure.*—J. M'G., aged forty. An hour before admission, on the 25th November, 1831, while at work on the causeway, a heavy stone fell on the outer side of his right leg, and produced a lacerated wound on the dorsum of the foot, extending from behind the outer ankle to the third toe. The fibula was extensively comminuted, and the ankle-joint laid open. The tibia was dislocated inwards, the projecting portion being covered with thin and abraded integument; there was also a distinct fracture of this bone, extending from the joint obliquely upwards through the inner malleolus. On bending the leg, and relaxing the gastrocnemii muscles, the dislocation was easily reduced; the edges of the wound were brought together by sutures, straps, &c., and the limb slightly bent and laid on Amesbury's splint.

On the 27th, he was bled to one pound, and began to use the *mistur. salin. diaphor. c. tart. antimon.*, and on the 28th, the removal of the dressings displayed a sloughy state of the wound. Diffuse inflammation of the foot and lower half of the leg took place, followed by sloughing of the integuments over the outer ankle and along the course of the fibula, profuse suppuration on both sides of the leg, and high febrile symptoms.

To prevent the pillow on which the leg lay in the hollow of the splint from being soiled with the discharges, and to obviate the necessity for its daily removal, which could not be done without raising the leg, disturbing the fractured bones, and giving pain to the patient, a small piece of oil-cloth was placed between the leg and the pillow, which retained the matter on

its surface till next dressing, when it was easily removed by a sponge. The antiphlogistic treatment was now laid aside, and he was allowed a full diet, with a pint of porter, daily.

During the progress of the suppuration, some difficulty was experienced in maintaining the foot in a proper position, there being a tendency to its eversion, and to the projection of the tibia at the inner ankle; these were, however, got rid of, by substituting M'Intyre's for Amesbury's splint, which afforded a broader and more secure resting-place for the limb. On the 20th of January, the fracture was found firmly united; but, on account of the slow cicatrization of the sore, produced by the sloughing of the integuments on the outside of foot, he was not dismissed till the beginning of March, when his leg was firm and straight, and the motions of the ankle-joint were nearly restored.

In this case, although the integuments were not laid open, as usually happens in the direction of the displaced bone, yet there was a lacerated wound on the opposite side, which communicated with the joint, and therefore rendered the dislocation in every respect a compound one. When we employ mechanical means for the cure of such injuries, it is of importance that our apparatus be so constructed, as not only to maintain the natural position of the parts, but that it may also permit the application of leeches, or such other external remedies as the inflamed state of the limb may demand, and the removal of the soiled dressings when suppuration has been established, without creating painful and injurious disturbance. These desirable objects I have found to be more easily accomplished by the employment of M'Intyre's splint, than by the ordinary method of treatment.

Sometimes dislocation of the ankle is complicated, not only with a fracture of the tibia and fibula, but also with fracture and displacement of some of the tarsal bones. In one case, to be afterwards detailed, an attempt to save the limb was followed by tetanus, and in the following case the injury was so extensive as to call for immediate amputation:—

CASE XCVII.—*Compound dislocation of the left Ankle-joint—Compound fracture of the left Tibia—Fracture and displace-*

ment of the Tarsal bones—Primary Amputation—Cure.—R. M., æt. forty-four, 22d January, 1827. An hour before admission, fell from a considerable height in a quarry, his feet first reaching the ground. There were two large wounds on the inner side of the left leg—one at the internal malleolus; through which the tibia and astragalus protruded, the latter bone being fractured as well as the calcaneum and naviculare. The other wound was three inches higher up, and there projected through it an inch and a half of the superior fractured end of the tibia. The fibula was also fractured, and several comminuted pieces of the tibia lay loose in the wound. The posterior tibial artery was carried before the displaced portion of the astragalus, but without being wounded. The right ankle was swollen, tense, and painful on pressure and motion, but the bones were not displaced, nor could crepitus be detected. He lost a considerable quantity of blood from both wounds. His countenance was pale, his pulse feeble, and he complained of chilliness.

On account of the extensive and complicated nature of the injury, amputation below the knee was immediately performed. Inflammation attacked the stump; adhesion was prevented; and the skin detached by vesication. Ultimately the parts granulated rapidly; the stump healed; and the patient was dismissed about the end of February.

The astragalus, with which the lower end of the tibia is articulated, is often fractured and displaced in compound dislocations of the ankle, but it is seldom that the other tarsal bones suffer. In Sir A. Cooper's valuable Work on Dislocations, which contains cases of this form of injury, from the practice of a great many surgeons, only one case is recorded in which both the astragalus and calcaneum were fractured.

It frequently happens, when a primary amputation is performed on a healthy and robust individual, for a severe injury, that the constitutional excitement which ensues, is much more violent, and the local inflammation more severe, than when the same operation is had recourse to for chronic disease. We therefore require to adopt more active depletory measures in the former than in the latter case, and even occasionally to use the lancet.

The size of the articulating ends of the bones, and the number and strength of the surrounding ligaments, render dislocation of the knee-joint comparatively unfrequent. When the injury is *compound*, the laceration of the soft parts is generally so great as to require immediate amputation.

CASE XCVIII.—*Compound dislocation of the left Knee—Penetrating wounds of the left Thigh—Fracture of the right Femur, and penetrating wound of the right Thigh—Amputation of the left Thigh—Death.*—J. W., æt. twenty-three, admitted July 18th, 1831, at nine o'clock, P. M., having received the following injuries:—Three hours before, when standing on the shaft of a rail-road waggon, which was moving at the rate of eighteen miles an hour, it was overturned by coming into sudden collision with another ponderous vehicle of the same kind. The external condyle of the left femur projected an inch and a half through a lacerated opening in the outer edge of the popliteal space, fully three inches in extent; the upper ends of the tibia and fibula were driven up in front of the os femoris; there were also two ragged wounds on the inner side of the thigh, produced by splinters of wood, which permitted the finger to pass deeply among the muscles, and close by the femoral artery, the pulsations of which were readily discovered. The right femur was fractured about its middle, and there was a large irregular opening, which passed from the one side of the thigh to the other, a little above, but not apparently leading to, the broken ends of the bone. He was much sunk and oppressed, complained of nausea and coldness, pulse feeble and intermittent, countenance collapsed and anxious.

It was agreed, in consultation at ten, P.M., that amputation should be performed in the upper third of the left thigh. Before the patient was carried into the operating theatre, the fracture of the right femur was reduced, the edges of the wound were brought together by adhesive plaster, a Scultetus bandage applied, with the bran pillows, splints, &c., the limb being placed in the straight position. The double flap operation was performed, by transfixion, two inches below the trochanter.

The divided muscles were contused and dark-coloured. Not more than twelve ounces of blood were lost, the greater part of which was extravasated. Five vessels were tied, the flaps approximated, and the usual dressings applied. Towards the close of the operation syncope supervened, and it was nearly a quarter of an hour before the pulse at the wrist could be counted.

The knee was dissected, that the extent of the injury to the soft parts might be correctly ascertained. There was an extensive extravasation of blood under the investing integuments of the knee, and among the neighbouring muscles. The biceps flexor was torn across, immediately above the external condyle; as was the tendon of the triceps, two inches above its insertion; there was a large lacerated opening in the vastus internus, a little above the patella; the external head of the gastrocnemius was completely torn at its origin, and the fibular nerve was tightly stretched over the external condyle of the os femoris, which had projected through the wound. The popliteal vessels and nerves were uninjured; the capsular ligament was completely torn around the joint, as were the external lateral and crucial ligaments; the internal lateral ligament, although partially lacerated, being the only one belonging to the joint that was not completely destroyed.

19th.—Has passed a restless night; vomiting almost incessant; countenance good, but pulse extremely rapid. Bowels slow; slight oozing from stump.—*Enema domestic. stat. Hor. som. Opi. gr.* i.

20th.—Was delirious during the night, and could hardly be kept in bed; vomiting still troublesome; tongue white, but moist; thirst urgent; no pain in stump or opposite thigh.—*Hab. Haust. efferves. c. Tinct. Opii. gtt.* x. *3tia. q. q. hor.—Hor. somni Pil. Colocynth.* ii. *et post alv. respond. Opi. gr.* i.

21st.—Had some sleep, and was free of delirium; vomited the medicine, and had no stool till eleven, A. M., about three hours after he had taken a dose of the carbonate of magnesia, followed by lemonade. Pulse one hundred and sixteen, soft; skin hot and dry; face flushed.—*Utat. Mistur. Salin. Diaphor.*

Extreme irritability of the stomach, when the consequence

of a severe injury, is often to be referred to the shock which the nervous system has sustained, and must be viewed as an unfavourable symptom.

22d.—On undressing the stump, the inner surface of the flaps were sloughy.

25th.—Has been exceedingly restless and delirious, making frequent attempts to get out of bed, and to tear off the dressings from the stump. Pulse one hundred and thirty; considerable heat of skin, and flushing of the face; eyes clear and brilliant; tongue dry and furred. Has been calmer since eleven, A. M., when his head was shaved and leeches applied to it. Bandages have not been removed from the right thigh, but there is no unusual swelling or tension in the vicinity of the fracture.

26th.—Low muttering delirium; countenance hypocratic; is rapidly sinking—*Wine ad libitum.*

Died at nine, P. M., being the ninth day from the receipt of the injury. Permission to inspect the body could not be obtained, but we were allowed to examine the fractured thigh. On removing the splints and bandage, the integuments presented a natural colour, but there was a free discharge of a reddish-coloured fetid fluid from the wound, the edges of which were sloughy. When an incision was made over the fracture, the muscles were found soft and gangrenous, the soft parts were separated from the os femoris, and a large cavity formed, which was filled with bloody fluid, and extended from the trochanter to the inner condyle.

There is reason to suppose, that, in a few days longer, the gangrene, which had commenced deeply among the muscles of the thigh, would have extended to the surface and proved fatal; or at least the fatal termination could have been prevented only by amputation near the hip-joint.

Compound dislocation of the knee is so rare, that Sir A. Cooper has only met with one instance of it, and this was productive of less injury to the surrounding soft parts than in the case now detailed. I have seen four cases, and have twice dissected the parts. In two of these, besides extensive laceration of the integuments, muscles, and ligaments, the popliteal artery and vein were torn across; yet but little blood was lost, although one of the patients lay for more than three

hours before amputation was performed, or a tourniquet applied. The toughness and elasticity of a healthy arterial tube, often permits it to be displaced by violence from its natural course, and projected before the end of a dislocated bone, without laceration being the consequence.

ON INJURIES OF THE HEAD.

A CONSIDERABLE number of superficial injuries of the head were admitted, and in several of these the scalp was extensively lacerated, and the surface of the pericranium exposed. Two of the patients were females, and workers in a cotton factory. They had been dragged from the floor to the roof, by the hair of the head, which was torn off with that portion of the scalp to which it was attached, the pericranium being exposed. In one of these the lacerated integument was speedily replaced, and, to the astonishment of all who saw it, adhesion took place; but, in the other, the termination was different: the exposed part of the skull, which was fully seven inches in diameter, granulated slowly, and, before cicatrization was completed, inflammation of the brain occurred, and terminated in suppuration and death.

When a large quantity of blood is effused under the scalp, its evacuation by incision is seldom required, unless for the purpose of ascertaining the state of the bone, and that only when symptoms of compressed brain exist. The extravasated blood will be slowly absorbed, and the detached scalp regain its former connexions, while the removal of the fluid by puncturing the tumour, will not unfrequently give rise to troublesome and extensive suppuration.

CASE XCIX.—*Extensive effusion of blood under the Scalp, with slight concussion of the Brain—Cured.*—A stout labourer, thirty-eight years of age, was struck on the left side of the head by a brick, which fell from a considerable height. He lay in a state of stupor for nearly an hour, when his sensibility was gradually restored; and in a short time longer he was able to return distinct answers to the questions put to him. He complained of vertigo, headach, and nausea, which were removed by venesection, and smart purging. On examining his head, the scalp was found distended by fluid blood. The swelling, which appeared to be covered by the tendon of the occipito frontalis

muscle, commenced at the injured part where the integuments were not wounded, and gradually extended from the left to the right side of the head, and from the superciliary ridges to near the foramen magnum of the occipital bone. By the use of a strong lotion, composed of the murias ammoniæ and vinegar, this extensive effusion of blood was slowly absorbed, and, without the occurrence of a single unfavourable symptom, the parts were restored to their former state in less than a month.

Concussion of the brain may prove speedily fatal, and yet no lesion of this organ can be discovered on the most accurate examination. In the majority of cases, however, this injury will be found complicated with laceration of the brain, and effusion of blood, or at a more distant period it may give rise to inflammation.

Case C.—*Concussion of the Brain, apparently complicated with the effusion of Blood—Cured.*—W. D., æt. forty-two, was struck on the left side of the head and shoulder by a large piece of wood, while at work on the quay at the Broomielaw, on the 10th of January, 1827. He fell down, and remained insensible for two hours. When admitted into the Infirmary seven hours after the accident, he was drowsy, but quite collected. He complained of severe throbbing all over his head; his eyelids were swollen and livid; blood was extravasated under the conjunctiva of both eyes, and it was also oozing freely from both ears and nose. There was no wound of the scalp, but the clavicle was fractured. The pulse was one hundred, and full; the pupils natural, but sluggish; the skin hot.—*Bled to twenty ounces—Twenty-four leeches to head—Saline purgative.*

On the 11th he continued drowsy, his breathing was slightly stertorous, and the pulse had fallen to sixty-four. He was again bled, repeatedly leeched, and smartly purged; but a fortnight elapsed before the head-symptoms disappeared. He left the Hospital on the 9th of February.

The insensibility which immediately followed the injury, was to be referred to concussion; and the partial stupor which afterwards occurred, to extravasation of blood within the cranium. That the symptoms of compressed brain did not de-

pend on inflammation, is rendered probable by the fact of their having appeared so soon after the injury, before this morbid process could have been well established. It must be admitted, however, that this distinction cannot always be trusted to,—the interval between the subsidence of the symptoms of concussion, and the commencement of those of inflammation, being so short and indistinct, that the two states become gradually and almost imperceptibly blended together.

Bleeding from the ear is oftener met with in fractures of the base of the cranium, than in simple concussion of the brain. I have seen four cases of concussion, in which this symptom was present; two of these died, and on inspection no fracture was discovered, nor could laceration of the lateral or cavernous sinuses be detected. To this source such an occurrence cannot always be ascribed; we must therefore acknowledge, that both venous and arterial blood may be discharged from the ears, as frequently happens from the nose, without the existence of a fracture, or any other cognizable injury.

Case CI.—*Concussion of the Brain, followed by symptoms of Compression—Cure.*—W. B., æt. fifty, was admitted on the 31st of January, 1832, having received several severe blows on his head ten days before, which produced immediate insensibility, vomiting, and bleeding, from the left ear. He lay in this state for several hours, and then recovered so far as to be able to answer questions, though rather incoherently. In a short time, however, the stupor began again to increase, and, on his admission, the existence of partial compression was distinctly marked. He was dull and drowsy, and when asleep his respiration was stertorous. It was only after shaking him, and speaking to him with a loud voice, that he could be induced to open his eyes, which had a vacant expression, the pupils being dilated and torpid. For the first two days no answer could be obtained to any question that was put to him, but after the repeated application of leeches and blisters to the head and neck, and the use of purgatives, he became more sensible, his pulse rose from fifty-two to eighty in the minute, but he was still incoherent. Calomel was given as an absorbefacient. When the gums were affected, the improvement

became more decided, and, in ten days from his admission, the symptoms of compression had altogether disappeared. His mind, however, continued imbecile; his memory was much impaired; he could not recollect the names of his children, or of any of the objects around him with which he was most familiar, and he complained of deafness, headach, and vertigo. When dismissed on the 18th of February, his memory was partially restored, but a degree of fatuity still remained.

I have met with three cases of concussion, in which the fatal event was to be attributed to laceration of the brain; but in none of these did the laceration correspond to that part of the skull upon which the blow was inflicted. These injuries were confined to the upper and under surfaces of the cerebrum, and to the central commissure. The effusion of blood was considerable; and, in one of the cases, it was injected into the substance of the brain to some distance around the injured part. I think it not improbable, when slight symptoms of compressed brain manifest themselves, after those of concussion have disappeared, that there sometimes exists a partial laceration, giving rise to the effusion of blood. It does not necessarily follow, when a small portion of the brain is torn by concussion, that we should have immediate hemorrhage. On the contrary, the shock which the nervous system has sustained, produces a corresponding change on the action of the heart and arteries, thus enfeebling the circulation, and restraining the effusion of blood from the injured vessels; but when the symptoms of concussion have disappeared, and reaction is established, then the volume of blood, as well as its velocity, being increased, it is poured out from the lacerated vessels more freely, and a new train of symptoms induced which are entirely dependent on compression. This occurred in one of the cases above alluded to. The symptoms of compression gradually succeeded those of concussion, and terminated fatally by extravasation of blood, and not from inflammation.

That secondary hemorrhage may sometimes occur in the brain, as in other parts of the body, even after several days from the infliction of the injury, is rendered probable by the

history and inspection of the following case. The opinion which I was led to form of it at the time, has been since confirmed by the perusal of a case somewhat similar, as detailed by Mr. Brodie, in his excellent practical paper on "Injuries of the Brain," in the fourteenth volume of the Medico-Chirurgical Transactions.

Case CII.—*Compression of the Brain by extravasated blood—Death being apparently occasioned by secondary hemorrhage.*—T. C., æt. thirty-five, admitted 8th January, 1827. Eight days before this period, he fell from a considerable height on his head, and was carried home insensible. In three hours he had so far recovered as to be able to answer questions, but he lay for several days in a state of drowsiness, from which, however, he could be easily roused. His pulse was sixty-five, and feeble; his eyelids were half shut, and the pupils slightly dilated; but his respiration was natural, and free from stertor. No wound of the scalp or fracture of the skull could be discovered.

On the 9th, he had three severe attacks of convulsions—the last of which was followed by immediate and complete insensibility; his pulse sunk to fifty in the minute; his breathing became laborious; his pupils dilated and immoveable; and his urine and feces were passed involuntarily. He died on the 11th.

On inspection, a considerable portion of the dura mater was found detached from the cranium. Two lacerations of the substance of the brain were discovered, both being situated on the upper surface of the anterior lobes. That on the left side was covered by a firm coagulum, about the size of a walnut; while, from the right, nearly three ounces of blood was extravasated, and spread over the surface of the hemisphere. This blood was fluid, and had every appearance of having been recently effused.

The coagulum on the left side was probably formed soon after the injury,—any farther hemorrhage having been prevented at the time by the free blood-letting, and other depletory measures which were employed. On the 9th day from the period when the injury was inflicted, an increased determination of blood to the head took place, which was occasioned by

the attacks of convulsions, and a renewal of the hemorrhage was the consequence. The effused blood extended over the right hemisphere, and to this occurrence the sudden coma and death of the patient were to be ascribed.

Inflammation of the brain, when produced by external injury, may prove fatal by the effusion of serum and lymph, or by suppuration. Collections of serum on the surface and into the ventricles of the brain, with, occasionally, patches of coagulable lymph, are the morbid appearances most frequently observed. But in other cases, suppuration takes place in the site of the fracture, or at some distance from it—the matter being situated either exterior to the dura mater, or between this membrane and the brain.

Case CIII.—*Fracture of the Cranium, followed by the effusion of serum, and by suppuration.*—C. M'L., æt. twenty-two, fell from a considerable height on her head, on the 3d February, 1827, and remained in a state of insensibility for several hours. When admitted on the 8th, she complained of severe headach and throbbing of the temples; the pulse was fifty, and full; the pupils sensible, but contracted; the tongue covered with a white fur; and the lips dry and encrusted. Her countenance had a vacant expression; she was irritable and dissatisfied when spoken to, and her memory was much impaired. On examining the head, a round puffy and painful tumour, about the size of a hen's egg, was discovered over the upper part of the occipital bone, on the right side, into which an incision was made, but neither fracture nor detachment of the pericranium existed. She was *bled to sixteen ounces; twenty-four leeches* were applied to the head, followed by *a cold lotion;* and a *smart purgative* was administered. On the 9th, she was more collected, and complained but little of headach; the pulse had risen to eighty-four soon after the bleeding, but it was soft and compressible; the pupils were natural; the leeches and purgative were repeated. She left the Infirmary on the 10th, having obstinately refused to submit to a continuance of the treatment. The same evening she became delirious and unmanageable; and, at the earnest request of her friends, she was

re-admitted on the 12th. During the following five days, she continued to improve; the headach disappeared; the eyes were natural; and the pulse calm. On the 18th she had a rigor, followed by febrile excitement and pain in the head, with a feeling of constriction, flushing of the face, intolerance of light, delirium, &c. Blood-letting, both general and topical, with the other antiphlogistic means, were fully and frequently employed, but the inflammatory affection of the brain did not appear to be arrested. On the 20th, she lay quiet from commencing stupor; the pupils were dilated, and but slightly sensible to the stimulus of light; there was some strabismus, and the pulse beat one hundred in the minute. She became gradually more and more comatose, and died on the morning of the 22d.

On inspection, a fracture of the cranium was discovered, but without the slightest depression. It extended from the posterior inferior angle of the right parietal bone, about an inch below the boundary of the external tumour, and terminated in the foramen magnum. The superficial and deep-seated vessels of the brain were loaded with blood. The anterior lobe of the left hemisphere was covered with a thick layer of pus, which secretion was also discovered in considerable quantity between the cerebrum and cerebellum. There were patches of sanguineous extravasation under the arachnoid membrane, alternating with opaque spots from the deposition of lymph. The lateral ventricles contained three ounces of lymphid serum.

Case CIV.—*Compound fracture of the Cranium, with depression of the bone successfully removed.*—R. A., æt. forty, admitted February 1st, 1832, at six, P. M., having on the preceding evening, at ten o'clock, been assaulted by two men, when he received several blows on his head with a bludgeon. He was stunned for a short time, but soon recovered so far as to be able to walk home. In the course of an hour he vomited two English pints of blood, after which he was said to have become drowsy. At the time of his admission into the Infirmary, he was perfectly collected, but irritable and peevish, and complained of intense pain in the head. The eye was suffused; the pupil variable; the pulse sixty, and of good strength. On the fore-

head, about an inch and a quarter above the middle of the left supra-orbital ridge, there was a lacerated wound, through which a portion of the frontal bone, about an inch in diameter, was observed to be fractured, and slightly depressed. He was immediately bled to twenty-four ounces; and on visiting him at nine, P. M., about three hours after his admission, I found that his pulse had risen to eighty, and that he had had a slight rigor. The depressed bone was firmly fixed, but at one point the pulsatory motion of the fluid blood, which filled up the fissure, showed that the fracture extended through both tables of the skull. On enlarging the wound by a crucial incision, and dissecting back the flaps, I raised up the depressed bone with the elevator, and removed it in five separate pieces, along with a small coagulum. From the oozing of blood, the small size of the opening in the cranium, and the restless state of the patient, who was secured with some difficulty, it was impossible to ascertain whether the dura mater was injured or not. The edges of the wound were retained in contact by a suture, and the usual dressings, with a double-headed roller, applied. A bladder containing a refrigerative mixture was applied to the head, and a purgative exhibited. For the first nine days, the most active antiphlogistic measures were employed. Besides smart purging, nauseating doses of emetic tartar, &c., one hundred and twelve ounces of blood were detracted by venesection. On the 14th, an abscess burst in the left ear, after which no unfavourable symptoms occurred. The wound healed slowly, the pulsations of the brain became gradually more obscure, and he was dismissed, cured, on the 19th of March.

In such a case, nearly all the surgical authorities of the present day condemn the practice of applying the trephine, and removing a sound portion of the cranium, that the depression may be elevated, unless symptoms of compressed brain exist. They approve of the removal of such loose and detached splinters as can be readily laid hold of by the forceps, or raised by the elevator; but until symptoms of compression appear, either from the effusion of blood, or the occurrence of suppuration, they are, with one or two exceptions, unanimous in condemning the trephine. On the contrary, Pott recommends that the

cranium be perforated, and the depressed bone elevated, not with the view of removing existing symptoms, but as a preventive of ill consequences. Sir A. Cooper, and Mr. Brodie, appear less hostilely opposed to this practice, than the rest of their contemporaries. The former gentleman says, "I generally use an elevator to raise the depressed bone, but *rarely* apply the trephine;" whilst Mr. Brodie is of opinion, that, when the depression is slight, and the symptoms trifling, the trephine should be applied only when the injured bone is exposed, in consequence of a wound of the scalp. Considerable diversity of opinion also exists as to the cause of the suppuration, which so frequently occurs in the neighbourhood of a fractured and partially-depressed bone. The majority assert that this suppuration does not arise from the depressed bone, but from the violence inflicted on the brain by the original injury; and that, of course, the application of the trephine cannot prevent the formation of the pus, but, on the contrary, by the additional injury which it produces, the inflammatory mischief will be greatly aggravated. They have recourse, therefore, to active antiphlogistic treatment, which they maintain is generally successful in warding off the impending danger; and assert that the trephine ought not to be applied, till, from the accumulation of matter, unequivocal symptoms of compressed brain manifest themselves. To wait for this occurrence, is to delay till the chances of success from surgical interference are almost hopeless. We have no means of ascertaining the exact situation of the purulent collection, or whether it lies above or below the dura mater; and we shall often fail in evacuating it, even after the trephine has been employed. I have seen it spread over an entire hemisphere; and when it is so situated, and so extensive, the disorganization of the brain, resulting from its accumulation and diffusion, will frequently lead to a fatal result, even although it should be evacuated by an operation. But this cannot be accomplished when it is collected under the pia mater, a situation in which Sir Astley Cooper states that it will be generally met with. It does therefore appear, that if we can, by a cautious use of the trephine, remove the fractured and depressed bone, soon after the injury has been inflicted, we shall succeed in relieving the brain from

a source of dangerous irritation, and be enabled more effectually to combat the inflammation, and ward off the suppuration, which so frequently ensue; and that, upon the whole, the result will be more fortunate than were the operation deferred till suppuration had commenced, and symptoms of compression were present. I have seen, during the last six years, five cases of compound fracture of the skull, with partial depression, treated in the Infirmary, according to the Abernethian plan, but unsuccessfully. There existed at first no symptoms of compressed brain; it was therefore considered imprudent to have recourse to the trephine, the usual antiphlogistic means being alone trusted to. In from six to fourteen days, a rigor took place, followed by headach, drowsiness, and stupor, until at length stertorous breathing, slow pulse, dilated pupil, coma and death supervened. In two of these cases, the trephine was applied, and a small quantity of pus, collected exterior to the dura mater, was evacuated, but without the slightest relief to the compressed brain. On dissection, the greater part of this fluid was discovered between the dura and pia mater, and between the pia mater and brain; and in these two, as well as in the other fatal cases from suppuration, the inner table of the skull was more extensively fractured than the outer one, and an irregular portion of it thrust down on the brain. Finding that these unfavourable results are of such frequent occurrence, when the operation is deferred till suppuration is established, I have been long of opinion with Mr. Brodie, that, in compound fracture of the cranium, the early removal of the depressed portion of bone by the trephine, when it cannot be accomplished by the elevator, is the safest, and likely to become the most efficient practice. I have only had an opportunity of trying it in one case, and in this the result was successful.

ON INJURIES OF THE SPINE.

Several cases of partial paralysis of different parts of the body, consequent on injuries of the spine, were admitted into the Infirmary under my care. Of these, the following, from the rarity of its occurrence, is not unworthy of being recorded.

Case CV.—*Slight injury of the Spine, followed by paralysis of the Muscles which fix the Scapula.*—M. S., æt. twenty, admitted 19th March, 1827. On attempting to raise his right arm, which he could do to a right angle with the body, the scapula of the same side immediately started between three and four inches from the ribs, and projected backwards, until its base was on a line with the spinous processes of the vertebræ. A similar projection, although to a less extent, took place on attempting to carry the scapula forward; but the displacement of the bone could be prevented when performing either of these movements, by applying the hand, and pressing the scapula firmly against the ribs. He complained of pain in the shoulder, and about the commencement of the dorsal vertebræ; but the chief uneasiness he experienced was, from the stretching of the parts during the displacement of the bone. Sixteen months previous to this time, he fell on his back; and, in a month after, the defect in the motions of his arm, and an unusual projection of the scapula, were observed for the first time.

A variety of treatment was adopted, but without the slightest benefit. Blisters, moxa, and friction, to the cervical and dorsal spine, followed by galvanism, the shower bath, &c., were the most active of the remedies employed. He left the Infirmary, after several weeks' confinement, without experiencing any relief.

In this case, the displacement of the scapula, consequent on certain movements of the arm, evidently depended on an impaired tone, or paralysis, of one or more of the muscles passing from the trunk to this bone, and intended to retain it in

contact with the chest—those affected being probably the serratus major anticus, and rhomboides. The accuracy of this opinion was confirmed by observing, when the arm was at rest, the natural appearance and position of the scapula, and that it could be thus retained by pressure with the hand, and its displacement prevented. Had its unnatural projection been occasioned by the formation of a large chronic abscess behind it, as I have more than once witnessed, or had it been thrust out by a lateral curvature of the spine, and a consequent projection of the angles of the ribs, it would have remained so in whatever position the arm was placed.

Case CVI.—*Injury of the cervical Spine, followed by paralysis of the upper and lower extremities—Cure.*—J. K., æt. fifteen, admitted 26th September, 1831, having fallen three days before from a height of twelve feet, and alighted on the back part of his head and shoulders. He was insensible for half an hour, and, on recovering, it was observed that he was unable to move his arms or legs. He complained of acute pain on pressure, and motion from the second cervical to the fourth dorsal vertebræ, but there was no wound, and but little swelling, neither was fracture nor displacement perceptible. The respiration was laborious and interrupted—being chiefly performed by the abdominal muscles and diaphragm, unaccompanied by any perceptible motion of the thoracic parietes. The abdomen was swollen and tympanitic; the urine, which had a strong ammoniacal smell, and the feces were passed involuntarily and unconsciously, but the sensibility of the paralytic parts was not impaired. In a few days, by repeatedly applying leeches, followed by blisters, to the affected part of the spine, he began to move the fingers of the right hand; and afterwards, by a continuance of the same treatment, with small doses of calomel, the power of the lower extremities became gradually more and more apparent. On the 26th of October, he could move both the upper and lower extremities, and was nearly able to turn himself in bed; but his respiration, especially during sleep, continued laborious, and was sometimes even stertorous. Under the internal use of strychnia, and its application to the vesicated parts of the spine, the paralysis

gradually disappeared, and the power of his upper and lower extremities was completely restored. He was dismissed on the 16th of November.

The insensibility which immediately followed the fall, was to be attributed to concussion of the brain, and the subsequent paralysis to compression of the medulla spinalis. That this latter occurrence did not depend on fracture or displacement of any of the vertebræ, was rendered probable by the gradual, but complete removal of the paralysis; and, by its immediately following the injury, it was still more obvious that it was not the result of inflammation. It seemed to be caused by the effusion of blood,—the symptoms to which it gave rise, disappearing as the extravasated fluid became absorbed. I have met with two cases, in which this form of spinal injury proved fatal. In the first, the cord was lacerated, and the blood effused within the theca; but in the other, the extravasation was exterior to this membrane. In both, the loss of sensation, as well as of voluntary motion, was complete. When this combination exists, the treatment is less frequently successful, because the effusion of blood is usually extensive. Instead of being confined to a small spot, the cord will be found surrounded by it, so that the pressure must tell on the posterior, as well as on the anterior roots of the spinal nerves, and sensation be suspended or destroyed, in addition to the loss of motion.

When no external marks of injury are present, it is sometimes difficult to ascertain the exact part of the spine to which the treatment should be directed. In the last case, this could only be done by an attentive examination of the accompanying symptoms; the pain was not confined to a small spot, as usually happens, but could be elicited from the cervical and upper dorsal vertebræ by pressure. The existence, therefore, of paralysis of the superior extremities, in addition to the symptoms which usually accompany compression of the spinal medulla in the dorsal and lumbar regions, showed that the effusion existed between the third cervical vertebra, and the origin of the nerves, which form the axillary plexus.

Case CVII.—*Injury of the lumbar Spine, followed by inflammation, partial paralysis, and death.*—D. H., æt. twenty-three,

was admitted 5th July, 1831, at three o'clock, A. M., when it appeared, that an hour previously, while asleep in the mill in which he was employed, two of his fellow-workers, by way of amusement, had fixed a rope to his right ankle, the other end of which was attached to the machinery. He was instantly raised to the roof, (a height of eight feet,) when his right leg was caught by one of the wheels, and completely torn from his body, about two inches below the knee. He fell on his back on the floor, and although little blood was lost, yet he continued feeble and exhausted for several hours. In my absence, amputation, by the circular method, was performed above the knee, by my colleague Mr. Angus. On the second day thereafter, micturition had become difficult and somewhat painful, but the catheter did not require to be employed. He complained of painful startings of the limbs, and of acute pain in the lumbar spine, aggravated by pressure and motion. From this time, the symptoms became daily more unfavourable: the fever was high, and accompanied by delirium; the integuments of the stump sloughed, and a portion of the bone protruded; the sensibility and power of moving the opposite limb gradually decreased; retention of urine occurred; the feces were passed involuntarily; the belly became tumid and tympanitic; a slough formed over the sacrum; and he died at two o'clock, on the morning of the 25th.

On inspection, the vessels of the brain were turgid, and serum was effused under the arachnoid, and into the ventricles. The intestines were greatly distended with flatus, and the jejunum and ileon contained several dark patches, occasioned by a tumid and congested state of the mucous membrane. The inner surface of the bladder was of a bright scarlet colour. The medulla spinalis, in the lumbar and inferior half of the dorsal regions, was softened; its vessels turgid; and, on its investing pia mater, there were several patches of coagulable lymph. There was also a considerable effusion of serum under the theca, but no fracture or displacement of the bones could be detected.

Concussion of the spine was followed, in this case, by inflammation of the medulla, which ended in the effusion of lymph and serum, and in partial paralysis.

ON TETANUS.

NOTWITHSTANDING all that has been written on this formidable disease, we are forced to conclude, after minute and patient investigation, that as its pathology is still undetermined and obscure, so must the treatment of it be uncertain, and, in some measure, empirical. It is only by collecting and recording the pathological conditions of the various organs and tissues of the body, to which its influence may be supposed to extend, and by an attempt to connect these with the symptoms which characterized the progress of the disease, that we are likely to obtain such a knowledge of its seat and nature, as shall enable us to treat it on scientific principles, and with some probability of success. I have, therefore, selected the following cases out of a good many which have occurred to me. They contain that information, meagre and imperfect though it be, regarding the pathology and treatment of the disease, which my limited experience has afforded me.

CASE CVIII.—*Tetanus from a compound fracture and depression of the Skull—Fatal.*—At the hour of visit on the 25th of June, 1831, a man between sixty and seventy years of age was admitted into the Infirmary, on account of this disease, the symptoms of which had existed for seven days, and were exceedingly well marked and violent. There was permanent opisthotonos, with rigidity of the muscles of the neck, trunk, and extremities; and he had occasional spasms, during which the rigid state of the respiratory muscles produced distressing dyspnœa, and the face became purple-coloured, from the impediment to the circulation caused by the position of the head. The jaws were firmly closed, and deglutition completely impeded; his pulse was rapid, and indistinct; he was much exhausted, and was unable to articulate intelligibly, but remained quite collected and sensible till the moment of his death, which took place during a severe spasm four hours after his admission. Fourteen days previously, he was struck on the upper and back

part of the head, by a brick which fell down the shaft of a coal mine, where he was working. A scalp wound, about two inches in length, was produced, and he was stunned for a few minutes by the blow. On recovering, he walked a distance of two miles to have his head dressed, and contrived to do so daily, till the tetanic symptoms supervened, at which time the wound was nearly closed.

The body was laid on the face immediately after death, and the inspection performed in twelve hours. There was an unusual quantity of serum in the cervical portion of the spinal canal, the investing pia mater was more vascular than natural, and the cord softened. A fracture was discovered in the site of the wound, over the upper and posterior part of the left parietal bone. There was a slight depression of the external table, which could admit the point of the finger; but the corresponding part of the inner table was more extensively fractured and depressed, having encroached considerably on the brain, and formed a sharp triangular projection internally. On the outer surface of the dura mater, which was not wounded, there was collected about half an ounce of pus,—this lay immediately under the fracture, and was circumscribed by a deposition of lymph. The brain was in a state of congestion, and the medulla oblongata, and commencement of the medulla spinalis, were obviously softened and surrounded by a vascular portion of the pia mater.

In this case, the irritation resulting from the injury was directly excited in the brain itself, from whence it was transmitted to the spinal marrow. In this manner, the motory system of nerves was affected, and the usual symptoms of tetanus produced. Had the trephine been early applied, before the spasms had become general, it might have been productive of benefit,—at least such a procedure would have been, from the generally fatal result of this disease, perfectly justifiable. If the suppuration of the dura mater had increased rapidly during the progress of the tetanus, and produced decided compression of the brain, we might reasonably have looked for a total suspension of the power of the voluntary muscles, and a complete cessation of the tetanic symptoms.

CASE CIX.—*Lacerated wound of the right Hand— Tetanus— Death.*—J. L., æt. eighteen—admitted October 10, 1831. Two days before, his right hand was bruised between two rollers. A large flap of integuments was detached from the palm, and the fingers were much torn and bruised. On the 15th, three of the fingers were completely gangrenous, and there was superficial sloughing on the dorsum, but on the palm healthy granulation had begun. About four o'clock of the morning of the 17th, he complained of pain and stiffness in the neck, to which, rigidity of the muscles about the angles of the jaw, inability to open the mouth, and difficult deglutition speedily succeeded. In a few hours the muscles of the trunk became affected, violent opisthotonos ensued, and the parietes of the abdomen felt hard and rigid. At one, P.M., when I saw him for the first time since the commencement of these symptoms, I found the tetanic affection well marked, violent, and in the extremities, as well as in the trunk of the body. The rigidity of the muscles of the neck and spine was permanent, but he was seldom affected with those violent spasms so frequently encountered in this disease. Respiration oppressed, with mucous râle in chest; pulse ninety-six; tongue dry and coated. Has had no stool, although purgatives have been repeatedly given. Discharge from hand has become thin and offensive. Has a blister applied along the cervical and dorsal spine.—*Sum. st. Ol. Croton. Tiglii. gtt. ij.—Post. hor. duas hab. Enema c. Ol. Terebinth.—Sum. Acid. Hydrocyanic. gtt.* xv. *2nda. q. q. hor. et. toties injec. Enema. c. Tk. Opii. gtt.* lxx.

On visiting him again at midnight, I found that the spasms had continued undiminished, and that his strength was fast sinking. He died at five next morning, little more than twenty-four hours from the commencement of tetanus.

No satisfactory examination of the body could be obtained; it was with difficulty that Mr. Ure, the house-surgeon, was permitted to inspect the state of the nerves of the hand and arm, after the corpse was removed from the Infirmary.

The distal extremities of the third, fourth, and fifth digital branches of the median nerve, were dark-coloured and sloughy, as were the parts they supplied, but the trunk of the nerve was healthy. The ulnar nerve in the fore arm had several echy-

mosed spots in its neurilema from extravasated blood. This appearance was still more obvious in the palm; and, on tracing down its branches to the ring and little fingers, they were found destroyed by sloughing at the first phalanges.

Tetanus appeared in this case, when the irritation in the injured parts was rapidly diminishing; the sloughs were separating, the exposed surface was granulating, and the suppuration becoming more healthy. There did not exist any local or constitutional symptoms premonitory of its approach; on the contrary, it commenced suddenly, and advanced with more than its usual rapidity.

The symptoms which characterize this disease, evidently indicate an affection of the nervous system, but its exact seat or nature have hitherto eluded both physiological observation and pathological research. By some, the spinal marrow is considered to be the only affected part; by others, the brain; while a third class maintain that both these parts are implicated. It is but of late years that the spinal marrow and nerves have received that share of attention in our post mortem examinations, which their close connexion with the symptoms of the disease seem to demand. The increasing zeal with which morbid anatomy is now cultivated, will lead, it is hoped, at no distant period, to a more accurate knowledge than we now possess of the seat of the disease, and of the various structural changes to which it gives rise, and thus to the establishment of a more scientific and successful plan of cure. As a slight contribution to such an important investigation, I may shortly state, that I have now before me the notes of eleven dissections of cases of traumatic tetanus, upon which I ground the following statement:—The nerves in the vicinity of the wound or injury, were frequently, but not invariably, inflamed or congested. These morbid changes were usually observed at no great distance from the wound, but in other cases the nerve was sound for several inches above the injury, when red patches became perceptible. The spinal marrow was almost uniformly in a state of vascular congestion, even when the precaution was taken of preventing the gravitation of the blood to the back, by placing the body on the face immediately after death. Depositions of lymph, and effusions

of serum were frequently found under the theca, and the cord was softened. This change sometimes included the entire diameter of the medulla spinalis; but, in general, it was confined to one or more small portions of either its anterior or posterior columns,—the former part being more frequently affected than the latter. It appeared also, that when the tetanic affection resulted from an injury of the upper extremity, the morbid changes were in a great measure confined to the cervical portion of the spine; while the dorsal part was more frequently disorganized, when the disease was produced by an injury of the inferior extremities. In four cases, the anterior roots of the cervical and dorsal nerves were more vascular than natural, while the posterior roots were unaffected.* Mollescence, and congestion of the brain, with effusion of serum, under the arachnoid, and into the ventricles and base of the cranium, were sometimes perceptible.

Case CX.—*Tetanus from a compound dislocation of the Ankle-joint—Amputation—Death.*—J. L., æt. forty-seven. At nine o'clock, A.M., on the 27th of October, 1831, his right leg was suddenly caught by a chain connected with a blast furnace at Clyde Iron-works, by which he was forcibly dragged to some distance, and a compound dislocation of the ankle produced. On his admission at one, P.M., there was, on the outer side of the joint, a lacerated wound, four inches in length, through which the tibia, and a fractured portion of the astragalus, protruded. The dislocation could not be reduced until the anterior articulating surface of the astragalus was removed with Hey's saw, and the wound enlarged; two sutures were inserted, a compress soaked in blood applied, and the limb laid, in a semi-flexed state, on M'Intyre's splint. On the 29th, erysipilas commenced at the ankle, and extended to the knee; but by means of incisions, leeches, cold lotions, &c., its progress was arrested. On the 1st November, at ten, A.M., he began to

* This point is worthy of future investigation. It is now ascertained that the anterior roots of the spinal nerves are for motion, and the posterior for sensation. In tetanus, the motions, and not the sensations, being deranged, we might, from reasoning *a priori*, be led to infer, that marks of excitement might exist in the anterior roots of the spinal nerves, and not in the posterior.

complain of stiffness in the neck, and inability to open his mouth; and at a quarter to two, P.M., when he was submitted to a consultation, his deglutition was somewhat impeded, but there was no rigidity of the muscles of the neck or trunk; his countenance was rather sunk and anxious, and his pulse rapid and feeble.

It was agreed that amputation should be recommended, not on account of the condition of the limb, which was improving, but as it might be the means of arresting the progress of the tetanus, which was still in an incipient state. As he continued eager for this operation, after being candidly informed that its success was exceedingly doubtful, it was immediately performed above the knee, by the double flap. Before he was removed from the table, the muscles of his neck had become rigid, and an attempt to swallow a little wine and water nearly produced suffocation. He was ordered two drops of *croton oil*, to be followed by an *enema*, and ten drops of *prussic acid* every hour.

During the evening, the jaws became inseparably fixed, the muscles of the neck, spine, and abdomen became rigid, and deglutition completely impeded; a profuse perspiration broke out, partial stupor came on, and he died at ten o'clock on the following morning, exactly twenty-four hours from the commencement of tetanus, and twenty hours after amputation.

The limb presented the following morbid appearances:—A sloughy state of the subcutaneous and subfascial cellular tissue; fetid purulent depôts in the sheath of the tibialis posticus, and saphena veins; outer surface of the solæus, flexor digitorum, and tibialis posticus muscles were soft and sloughy a little above the ankle; dorsal branches of the musculo-cutaneous and saphenus nerves, for an inch above and below the instep, were in a dark sloughy state; posterior tibial nerve inflamed in several places; superficial veins thickened; arteries entire and healthy; extensor brevis muscle, with the two external tendons of the extensor communis, torn across, opposite the joint; middle and posterior fibulo-tarsal ligaments destroyed, as also a portion of the deltoid. The astragalus, a small portion of the upper surface of the cuboides, of the anterior superior part

of the os calcis, and the proximal end of the fifth metatarsal bone, were fractured.

Twenty-six hours after death the body was inspected, and the following changes noted:—Increased vascularity of the spinal pia mater; a small quantity of serum in the cervical and dorsal part of the theca; softening of the cord from the middle of the fourth dorsal, to the second lumbar vertebræ; greater vascularity of the anterior, than of the posterior roots of the spinal nerves; sciatic nerve healthy, till within four inches of its amputated extremity, where the neurilema was of a deep red colour; brain congested and mollescent; considerable serous effusion into the ventricles and basis of the cranium. There was no perceptible change in the state of the par vagum, lingual, gustatory, or cervical nerves, or of the semilunar ganglia; and the lining membrane of the larynx, pharynx, trachea, and bronchii, presented a natural appearance.

Amputation has been repeatedly had recourse to, and almost uniformly failed, in arresting the progress of traumatic tetanus. This want of success might fairly be anticipated, on considering, that before the irritating cause, which excites the disease, can be removed by amputation, the origin of the nerves in the brain, or spinal marrow, have become affected; and that, from this secondary source, the peculiar excitement which gives rise to the tetanic symptoms, will continue to emanate, although the original source of irritation be promptly removed. It is only when this unmanageable disease is commencing, and before it has extended to the trunk and become general, that amputation is at all admissible, and even here it can rarely be expected to succeed; it may not only fail in checking the disease, but it may also, as in the last case, irritate and exhaust the patient, and in this way accelerate the fatal event. Sir A. Cooper has only met with one case of tetanus succeeding to a compound dislocation of the ankle, and in such circumstances he decidedly disapproves of amputation. He has never seen it performed for this injury, but frequently for compound fractures above the joint, when it appeared to aggravate all the symptoms. Hennen relates a case which was cured by amputation, but the patient was cut off six weeks after by a fever, that had continued during the

whole progress of the disease. Larrey seems to approve of the operation in chronic cases, or when the disease is incipient. He has found it to be sometimes successful; and there are a few similarly fortunate cases recorded by others: but, upon the whole, we are forced to conclude, that, by adopting this treatment, we are subjecting the patient to additional pain and danger, for the slightest possible chance of ultimate benefit.

Case CXI.—*Tetanus from a simple fracture of the Radius and Ulna, followed by gangrene of the hand and fore arm—Death.*—M. C., æt. fifty, admitted on the 1st of February, 1832. Four days previously fell and fractured the left radius and ulna, a little above the wrist. Soon after the accident, the arm was put up in splints by a surgeon. On her admission, she complained of burning heat in the arm, and the points of the fingers were observed to be livid and vesicated. On removing the splints and bandage, the hand and lower half of the fore arm were completely gangrenous, being of a dark green colour; cold, emphysematous, and insensible to the touch. She was a feeble and emaciated creature, of the most dissipated habits; and, to add to her misfortunes, she had borne eighteen children.

By the free use of opium, quina, spirits, and porter, the gangrene was arrested within two inches of the elbow, the constitutional symptoms diminished, and her strength was tolerably sustained. On the 11th, there was a distinct line of separation between the dead and living parts, and a considerable discharge of pus from the boundary, which rendered it probable that the ulcerative detachment then going on, would soon extend through the whole depth of the fore arm, and warrant the performance of amputation. At five, P. M., of that day, she complained of stiffness in the neck, and slight inability to swallow, with spasmodic twitchings of the sterno-mastoid muscles. In three hours, all the muscles of the neck were hard and rigid, her head was hurriedly moved from side to side by spasms, the abdomen was hard and tense, and she complained of pain under the sternum. Pulse one hundred and twenty, weak; skin hot; bowels slow.—*Ordered a dose of croton oil.*

On the morning of the 12th, when I saw her for the first time after the commencement of tetanus, there was permanent opisthotonos, and an almost universal rigidity of the voluntary muscles, with dyspnœa and cough, which prevented her from lying in a recumbent position. The countenance was anxious; the pulse ninety, and feeble; the skin covered with profuse perspiration. She had had several dark and offensive stools from the oil, after which she took *Calomel gr.* vi. *Opium gr.* i. every second hour.—*Acid. Hydrocyanic. gtt.* x., every second hour; and, at the same time, an *enema* containing *Tk. Opii. gtt.* lxx.

At two, P.M., the spasms were less severe, and the permanent rigidity was somewhat diminished, but the pulse was irregular, the dyspnœa had increased, and she complained of acute pain under the sternum.—*Augeat. Acid. Hydrocyanic. ad gtt.* xv. *2nda q. q. hor.*—*Stat. Reptr. Enema Terebinth.*—Irons heated in boiling water were applied along the whole course of the spine, and vesication instantly produced. For two hours the symptoms were decidedly relieved, but her strength began to give way, deglutition was completely impeded, the cough and dyspnœa increased, and she expired at seven o'clock of the following morning,—being the seventeenth day from the receipt of the fracture, the twelfth from the commencement of gangrene, and about thirty-eight hours from the supervention of tetanus.

On inspection, the brain was in a state of congestion, and a considerable quantity of lympid serum was effused under the arachnoid, and into the ventricles. The cervical portion of the spinal marrow was softened, especially the anterior column; the investing pia mater was turgid; there was serum effused under the theca; and the anterior roots of the cervical nerves were more vascular than the posterior ones. The liver was enlarged and tuberculated; all the other viscera appeared to be healthy. The gangrene had involved all the soft parts of the hand and fore arm; the median and cutaneous nerves were of a deep red colour, as far up as the axilla; the radius was obliquely fractured about two inches above the wrist, and the ulna close to its distal articulation. The surrounding soft parts did not appear to have been contused or lacerated more than

might have been expected, and none of the larger arteries were wounded.

As the gangrene seemed to depend, in a great measure, on constitutional causes, and not on the extent or severity of the local injury, I was decidedly opposed to amputation, until a distinct separation had taken place between the dead and living parts. Before this was satisfactorily established, tetanus supervened, and proved fatal. The treatment adopted, although sufficiently active, had, as usual, but little effect on the disease. She appeared to derive considerable relief for a short time from vesicating over the spine,* and, for a few minutes after every dose of prussic acid, the rigidity of the muscles of the neck was sensibly diminished. I have now used this powerful medicine in several cases of tetanus, in some without the slightest benefit, in others with partial relief, but in only one case could the cure of the disease be attributed to it. Its effects on the system are so rapid and transient, that it ought to be administered in small and frequently repeated doses, probably allowing no longer an interval than fifteen or twenty minutes to elapse between each.

When the power of deglutition is suspended by the violence of the spasms, attempts have been made to throw medicines and nourishment into the stomach, by introducing a tube by the nose or mouth. I attempted this in two cases, but without success. The tube was firmly grasped by the pharynx, and suffocation nearly produced. We may still succeed, however, in acting upon the disease, by injecting medicines into the rectum or into the veins. The former method has been long adopted, and found useful, the latter but rarely and partially. It was lately tried in a case under my care, but the disease was too far advanced to be benefited by it. It is certainly the most rapid method of introducing medicines, and diffusing their

* When, as in tetanus, it is an object to produce vesication along the spine as rapidly as possible, I find that the use of irons which have been for some time immersed in boiling water, will have this effect, with nearly as much celerity, and with less pain, than the application of the actual cautery. I have also vesicated, or at least removed the cuticle, in less than five minutes, by applying, for two or three times in succession, clothes wrung from boiling water.

action through the system, with which we are acquainted; and in a disease so generally unmanageable and rapidly fatal as tetanus is, it seems entitled to a fair and impartial trial.

The chronic form of the disease is sometimes curable by smart and appropriate treatment. Within the last three months, I have seen three cases, in which this fortunate termination took place. One of these occurred in the Infirmary, under the care of my colleague Mr. Angus; the other in private practice; and the third I had an opportunity of witnessing under the care of Mr. Easton, surgeon in Calton. In the last case, the disease commenced on the 11th day, in consequence of a wound over the left ulnar nerve. The rigidity affected the abdominal muscles, before any degree of trismus was produced. The pulse continued about one hundred and twenty in the minute, but there was little abatement of the spasms for nearly three weeks, when that disease gradually disappeared under the use of smart purging, followed by prussic acid and opium. The following is the only case of acute symptomatic tetanus occurring in my own practice, in which a cure was accomplished:—

Case CXII.—*Tetanus from a wound of the Foot—Cure.*—J. W., æt. seven, was wounded on the sole of the foot by a nail, on the 1st February, 1827; and on the 8th, the slight inflammation and suppuration which were produced had abated, and the opening was nearly closed. On the 11th, he began to complain of pain under the sternum, of stiffness of the neck, and difficult deglutition. In about eight hours the jaw was firmly closed, the back and abdominal muscles were rigid, the head retracted, the respiration impeded, and both the upper and lower extremities were occasionally affected with spasms; the pulse was one hundred and twenty in the minute, the countenance anxious, and the bowels constipated. After free purging with croton oil, by which a large quantity of dark-coloured feces was expelled, the spine was vesicated from the neck to the sacrum, by the application of irons heated in boiling water, and the denuded parts covered with the tartar emetic ointment, which produced a copious purulent discharge. The prussic acid was administered in doses of five drops every

hour, and he had an enema containing thirty drops of laudanum every second or third hour. On the 14th, the symptoms were less urgent; he could open his mouth so as to admit the point of the finger, and he could swallow and articulate with more freedom. The spasms had also diminished, but there was still permanent rigidity of the muscles of the neck, spine, and abdomen. These, however, gradually diminished; and on the 20th, all the tetanic symptoms had disappeared.

ON BURNS.

WITHOUT discussing the many important topics, practical as well as theoretical, which this subject naturally presents, I shall content myself with shortly stating a case or two, for the purpose of illustrating the treatment which I have found most successful, and then proceed to examine the pathological changes in the internal organs which so frequently supervene, and prove destructive to life. When, by a burn or scald, the cuticle is extensively vesicated, and the surrounding integuments inflamed, the immediate application of finely-carded cotton will be found, not only to soothe the local pain and irritation, but also to form a covering to the injured parts, under which cicatrization will advance more rapidly than by any other application with which I am acquainted. The vesications having been punctured, and the serum discharged, the burnt parts are to be immediately covered with several successive layers of fine fleece cotton, which must be retained in close contact with the injured surface, by the application of bandages. In this way, a smooth, soft, and equable covering is formed; the discharged fluid is absorbed; and, by not unnecessarily disturbing the tender and irritable parts, cicatrization is encouraged, and suppuration often prevented. The cotton, unless moistened with the discharge, should not be removed until it has become detached, which always happens so soon as the cicatrization is completed. We then find that the layer of cotton, in immediate contact with the burnt parts, separates in the form of a smooth, dense crust, similar to a scab or eschar, leaving the vesicated surface healthy and cicatrized. By adopting this plan of treatment, pain and irritation are avoided, and the formation of tedious and troublesome ulcerations is prevented, as well as of those thickened cicatrices which are so frequently productive of deformity and inconvenience. Although this practice has been long had recourse to in this part of the country, it is only since the publication of my friend Dr. Anderson's excellent paper on the Treatment

of Burns, in the first volume of the Glasgow Medical Journal, that the medical men here have appeared to appreciate its utility, or to have examined the most efficient mode of employing it. Since that time, it has been used in this hospital with marked advantage, in many cases of both old and recent burns; in others, it has proved inefficacious, if not hurtful. Some of these I shall afterwards allude to; in the meantime I shall only detail two cases, out of a good many, which I have met with, where the efficacy of the practice cannot be disputed.

Case CXIII.—*Extensive Burn from an explosion of gas—Cured by Cotton.*—A. C., æt. twenty-two, had her face, neck, breast, and arms severely burnt by an explosion of gas in a cellar, on the 22d December, 1831. When admitted on the following day, the injured parts were red, swollen, painful, and covered by numerous large vesications. These were punctured, and several layers of corded cotton applied, which, with the exception of those on the face, were secured by a bandage. For several days the febrile excitement was rather high; the pulse ranging from one hundred to one hundred and thirty; the tongue was thickly furred, the thirst urgent, and during one night she was occasionally delirious. By the use of the emeto-cathartic mixture, the urgent symptoms were subdued, and the local pain, which had been more severe, and of longer duration than usual, gradually subsided; the cotton was found firmly adherent to the burnt surface, and was not removed till the 13th of January, twenty-two days after its application, when it had become loose and detached. The parts were completely cicatrized, and in a few days the florid colour disappeared, and she was dismissed without having suffered the slightest deformity.

CXIV.—*Extensive Scald—Cured by Cotton.*—J. G., æt forty-two, was scalded with boiling water, over the anterior and inferior half of the thorax, over the whole abdomen to near the spine, and over both thighs. Extensive vesications formed, which were punctured, and in several places the cuticle had separated on removing the clothes. The parts were put up in

finely-carded cotton, and in four hours the pain ceased. Besides the usual febrile excitement, he was seized, on the fourth day after admission, with acute pain in the right side of the thorax, increased on inspiration and coughing. This was removed after he was bled to twenty ounces, and had used the emeto-cathartic solution. On the fourteenth day, the cotton, which was dry and hard, was so detached from the surface which it covered, as to be easily removed; it retained the shape of the parts to which it was applied, and had the cuticle adhering to it. The parts underneath were perfectly healed and sound.

The advantages of this practice are most conspicuous and decided, in simple vesicated burns, or where the disorganization does not extend deeper than the cutis vera; but even when the destruction is more extensive, and deep sloughs have been produced, I have frequently found that the ulcerated surface from which these were detached, has healed more rapidly under the use of cotton than by almost any other application, and that, by avoiding all unnecessary exposure and disturbance of the parts, and only removing the cotton entirely at distant intervals, or such portions of it as may become embued with the discharge, a great source of injurious excitement has been avoided, the strength more effectually preserved, and the process of cicatrization, which is so generally tedious under almost every mode of treatment, has been greatly accelerated.

The next case illustrates the good effects of this treatment. The injury was so severe and extensive as to occasion a tedious and protracted cure; yet under hardly any other mode of treatment could a result so successful have been obtained.

Case CXV.—*Extensive Burn of the Shoulder, Abdomen, and Thighs—Cured by Cotton.*—J. L., æt. seven, was admitted under the care of my colleague, Dr. Perry, on the 16th of April, 1831. Five weeks previously her clothes caught fire, and she was severely burned; the injured integuments sloughed from the right shoulder and arm, from the lower half of the abdomen to near the spine, and from the anterior surface of both thighs, exposing an extensively ulcerated surface, from which

there was a copious purulent discharge. When she came under my care on the 1st of May, the sores were covered with large spongy granulations, and almost no cicatrization had taken place. Her strength was much exhausted; she had a pale, unhealthy appearance, and her pulse was rapid and irritable. On the 13th I discontinued the ointment of Venice turpentine, which had been applied daily since her admission, and ordered the parts to be covered with several layers of carded cotton. She was also allowed a more nourishing diet, with a small quantity of wine. The dressings were not removed till the 7th of June, when the sores presented a more florid and healthy appearance, and a considerable portion was found to have cicatrized. Her health, however, continued to suffer; she became extremely emaciated, and was troubled with diarrhœa, but expressed herself as free of pain, and lay quiet, and apparently contented. She was ordered the chalk mixture, with opium, and the wine was increased to six ounces daily. By a continuance of this treatment, and a removal of the cotton every six or eight days, the parts healed slowly; and on the 20th of September, when she was sent to the country, there only remained open a small portion of the ulcerated surface on the lower part of the abdomen.

Had this large and tender surface been exposed to the various irritating causes inseparable from the daily removal and re-application of the dressings, unhealthy action would have been produced, cicatrization impeded, if not altogether prevented, and the constitutional irritation fearfully aggravated.

When the burn has penetrated deeply, and the eschar is still adherent, I prefer applying the turpentine liniment, or a solution of the chloride of lime, to the use of cotton. I seldom have recourse to poultices for the purpose of facilitating the detachment of the charred integuments, these warm and emollient applications, although decidedly useful in accelerating the ulcerative disunion of the sound and gangrenous parts, tend to induce exuberant and spongy granulations, and of course to establish that kind of unhealthy action which forms so serious an obstacle to cicatrization. When the injury is confined to the trunk of the body, the turpentine liniment is

employed; but when the extremities are implicated, I have found the chloride of lime solution infinitely preferable. When these applications are had recourse to, several layers of fleece cotton are laid over them, and the dressings are seldom removed until the sloughs have become detached, and a change of the treatment is required. I have already stated the favourable results of my experience in the use of dry cotton, both in vesicated and sphacelated burns. I must now allude shortly to those cases in which it appeared to be prejudicial. Without detailing the individual cases in which this treatment had to be laid aside, the following summary will suffice:—

In three cases of simple vesicated burns, the application of carded cotton, soon after the injury, was productive of such acute and continued pain, that it had to be removed, and a different remedy employed. In two cases of superficial burns, where the cutis vera was in a state of ash-grey ulceration, and the surrounding integuments presented a bright red colour, the local and constitutional excitement was so great, as to render the discontinuance of this application absolutely necessary. In four cases, during warm weather, the discharge was so profuse, the fetor so intolerable, and the generation of maggots so abundant and annoying, as to require a daily change of the dressing; and besides these inconveniences, the health of the patients became greatly impaired, the appetite diminished, and, in one of the cases, incessant vomiting and diarrhœa were excited. When these untoward occurrences manifest themselves, and especially when the injury is confined to the limbs, I have found the application of a solution of the chloride of lime exceedingly beneficial. In one case, where the front of the chest and abdomen was scalded with boiling water, lint, moistened in a solution of the chloride (containing gr. ij. of the salt to an ounce of water) was applied, and kept wet for ten days before it was removed, when nearly two-thirds of the abraded surface were cicatrized. The second dressing was removed four days after, when the cure was complete; acute pleuritis however occurred, and required free bleeding, purging, and the use of emetic tartar in solution. In another case, both lower extremities were scorched by the clothes catching fire; and, of course, the injury extended deeper than in the former one.

The same treatment was pursued, although, from the nature and situation of the injury, and the advanced age of the patient (fifty-nine years), the cure was more protracted. The first dressing was removed on the twelfth day, when the greater part of the leathery slough, produced by the destruction of the cellular texture, was found separated, exposing a florid granulating surface. The lotion was re-applied, and continued nearly three weeks longer, before cicatrization was completed.

I consider this a very excellent application to burns; it stimulates moderately, destroys fetor, and, when surrounded with oiled silk, it maintains a degree of heat and moisture, favourable to the separation of sloughs, and to the subsequent cure. In my estimation, however, no small share of the credit is due to the mode of its employment. Instead of removing the dressings daily, and thus exposing an extensive and inflamed surface to various sources of irritation, they are allowed to remain for several days, care being taken to keep the parts constantly moist, by the assiduous application of the lotion. The injured parts are thus preserved in a state of perfect quiescence, and all external interruptions to the healing process are avoided. Before the lotion is applied, if the vesications are large and tense, it is necessary to evacuate the serum by a number of small punctures, allowing the detached cuticle to remain, which forms a useful covering to the tender surface, and does not interfere with the subsequent cicatrization. Should the burn be extensive, and confined to the trunk of the body, the constant retention of wet dressings has sometimes chilled the patient, and given rise to internal inflammation; in such cases, the cotton is the preferable application, but when the extremities are involved, I have found the solution of the chloride of lime on many occasions eminently successful.

Case CXVI.—*Burn of the Face from an explosion of gunpowder—Cured by the chloride of lime.*—J. M'G., æt. fourteen, was admitted into the Royal Infirmary, June 5th, 1831, having had the whole face and part of the neck burned by an explosion of gunpowder the preceding day. The face was swollen, painful, and vesicated; and in some parts the cuticle was

rubbed off, leaving the skin of a dusky hue. The eyes were closed by an œdematous swelling of the lids, and there was constant and troublesome lachrymation. A weak solution of the chloride of lime was applied to the injured parts by means of lint, and retained in contact with them for four days, when, on the removal of the dressings for the first time, the parts were found completely healed, and the patient was dismissed, cured.

The fatal termination of burns may be generally referred to one or other of the following causes:—A direct prostration of the vital powers, arising from the extent and violence of the shock; the supervention of inflammation in some internal organ; the occurrence of convulsions; the invasion of the injured parts by gangrene; profuse and long-continued suppuration; and hemorrhage, from the exposure and ulceration of an important artery.

When the shock is severe, the function of the brain and nervous system being in a great measure suspended, that derangement of the vascular and respiratory systems is produced, which forms so prominent a feature in this class of injuries. This state is characterized by a shrinking and coldness of the body, pale and contracted features, a rapid and feeble pulse, hurried respiration, and a greater or less degree of insensibility to pain, approaching sometimes to stupor. It may terminate fatally in a few hours, or continue for two or three days before death is produced, or reaction established; the severity and duration of the symptoms depending a good deal on the extent and situation of the injury, the cause by which it is produced, and the age of the patient.

The treatment usually adopted during the stage of prostration, consists in the free and frequent use of diffusable stimulants, with the application of heat to the trunk and extremities of the body;—diluted brandy, with small doses of the carbonate of ammonia and opium, will seldom fail, if carefully administered, in producing the desired reaction. Should we not succeed, however, as will sometimes happen, and there is a risk that the collapse may prove fatal, blood-letting may be adopted. In all such cases there must exist a considerable accumulation of blood in some of the internal organs, to which

the imperfect action of the heart, and the feeble and thready pulse, may in part be referred: and should the patient be an adult, and of a robust habit, these symptoms may be beneficially acted upon by venesection, and thus reaction be more speedily established. I have only once had an opportunity of using the lancet during collapse from a severe burn. The usual stimulants had been exhibited for four hours, and failed; but after fourteen ounces of blood were detracted from the arm, a renewal of the stimuli proved more successful, and in less than an hour the heat was restored to the skin, and the pulse became full and bounding. In another case, where, from the youth of the patient, and the extent and situation of the burn, venesection was impracticable, an attempt was made to relieve the congestion of the brain by leeches. Although it was not attended with benefit, I shall shortly state the case, on account of the post mortem inspection:—

Case CXVII.—*Severe Burn—Fatal during the stage of collapse.*—M. C., aged two years. Six hours before her admission, on the 16th November, 1826, her clothes caught fire, and nearly the entire upper half of the body was scorched. The integuments of the neck, breast, abdomen, back, shoulders, and arms were brownish-coloured, hard, and completely charred. Warm turpentine was applied, but as it produced acute pain, it had to be removed, and the Carron oil substituted. Brandy and ammonia were freely given, she was immersed in a warm bath, and all the usual methods for exciting reaction were employed, but without effect. The pulse was not to be felt, the skin was cold, the face pale and sharp, the pupils dilated and immoveable. Leeches were applied to the head, but the quantity of blood obtained was trifling; the stupor gradually increased, the respiration became laborious, and the child died comatose, twenty-eight hours after the injury.

On inspection, the vessels of the brain and its membranes were turgid with blood; there was an increased effusion of serum under the arachnoid and into the ventricles; the lungs were loaded with blood, as were the venæ cavæ and right auricle of the heart; but the mucous membrane of the lungs, stomach, and intestines was healthy.

As physical irritability predominates in childhood, we may expect that burns shall then give rise to more violent symptoms of constitutional excitement than at a more advanced period of life. Accordingly, infants are often carried off by convulsions, either within a few hours of the injury, or previous to the fifth day. When this untoward occurrence is early in its appearance, and rapid in its progress, but slight traces of cerebral disorganization can be discovered; but when several days have elapsed between the infliction of the injury and the commencement of the attack, the protracted irritation to which the brain has been exposed, tends not only to produce a greater degree of functional disturbance, but also of structural change.

Case CXVIII.—*Extensive Scald—Fatal Convulsions on the ninth day—Dissection.*—E. S., æt. three years, was scalded four hours before her admission, on the 3d of August, 1831, with boiling water, on the back, buttocks, lower half of the abdomen, and upper part of thighs. The cuticle in some parts was raised into large vesications, and from others it was entirely abraded. Carded cotton was applied, and, as reaction had taken place, the bowels were freely opened, with calomel and castor oil, and afterwards small doses of an antimonial diaphoretic were given. The febrile excitement continued urgent, but the head did not appear to be affected until the 9th. At the hour of visit, the child was restless, and screamed occasionally; the eyes were suffused and irritable, the pupils dilated, the face flushed, and the tongue loaded.—*Leeches and cold applications to head.—Small doses of calomel.*—In the evening of the 10th, she was seized with convulsions, which continued with but little interruption during the whole night, and proved fatal on the following morning.

On inspection, the pia mater was unusually vascular, and there was an effusion of serum, with here and there a small patch of lymph between this membrane and the arachnoid. The vessels of the choroid plexus were turgid, and each lateral ventricle contained three drachms of turbid serum. The viscera of the thorax and abdomen were healthy.

Besides the tendency to morbid changes in the brain, severe burns frequently prove fatal, by inducing inflammation of the serous or mucous tissues of the thorax or abdomen. Dupuytren, who appears to have investigated the pathology of this class of injuries with considerable attention, enumerates the following sympathetic or secondary lesions, as those which he has most frequently met with; inflammation of the intestinal, gastric, and pulmonary mucous membranes, of the serous membranes of the brain, thorax, and abdomen, and collections of blood and pus in the articulations of the burned extremities.* I am not prepared to admit, that the mucous membrane of the digestive organs is more frequently the seat of the inflammation, than the serous membrane of the abdominal cavity, as Dupuytren seems to affirm. On the contrary, I am led to an opposite conclusion, by the dissections I have witnessed. These tend to corroborate the opinions of my friend Dr. Cumin, to whom the profession in this country is indebted for the earliest information on this important topic. He states, in his excellent practical paper on Burns, in the Edinburgh Medical and Surgical Journal for July 1823, that the mucous membranes suffer much less than those of the serous class, and that that cavity is most liable to be affected, the cutaneous surface of which is most extensively injured. I have also observed, that when this internal inflammation commences soon after the injury, and in an acute form, which it frequently does, the morbid changes it produces are usually confined to the serous tissues, but that the mucous membranes suffer more extensively when the disease is chronic, or does not appear till a more advanced period. The first case which I had an opportunity of inspecting confirmed this opinion.

Case CXIX.—*Burn of the integuments of the Abdomen—Fatal four months after, from slight Peritonitis, and extensive Ulceration of the alimentary mucous membrane.*—M. M., about five years of age, was admitted into the Infirmary on the 23d of February, 1826, on account of an extensive burn of the

* Nouveaux Elemens de Pathologie. Par Roche et Sanson. 2nde edition. tome iv. p. 202.

abdomen and back, produced by her clothes having caught fire. On the 1st of May following, when I succeeded Dr. Young in charge of the surgical wards, I found that more than one-half of the ulcerated surface was healed, but that her health was much impaired, and she was a good deal emaciated. About the beginning of June, there only remained, about the centre of the hypogastrium, an open sore of a crescentic shape, an inch broad, and three inches in length. This part ceased to heal, and the granulations became pale-coloured, and gelatinous. No febrile excitement, however, took place; the appetite continued good; the bowels regular; and the tongue clean. On the 19th, after a slight rigor, she complained of pain in the abdomen, midway between the pubes and umbilicus, which was aggravated by pressure; the pulse was quickened, the heat of skin increased, the tongue furred, and the bowels loose and irritable. Leeches and fomentations were applied, and she had a small dose of *oleum ricini*, followed by *calomel* and *creta*, a *warm bath*, &c.

On the 20th she had another rigor, followed by increased febrile disturbance, diffuse pain, and slight tympanitic swelling of the belly; a very rapid and feeble pulse, urgent thirst, vomiting, diarrhœa, and an anxious collapsed countenance. In the course of a single night, the granulations were absorbed from the unhealed sore, and a hollow cavity produced, which was pale-coloured, smooth, glassy, and dry. A considerable portion of the new cicatrix re-ulcerated. She became gradually more and more exhausted, and expired on the evening of the 28th.

On inspection, there were a few patches of inflammation on the peritoneum covering the abdominal parietes, and the small intestines, but without either sero-purulent or lymphy effusion. On slitting open the bowels, the mucous membrane of the lower half of the duodenum, and of the jejunum, and ileon, was exceedingly vascular, infiltrated both with blood and serum, and extensively ulcerated.

It is difficult to account for the occurrence of abdominal inflammation at so distant a period from the infliction of the injury, especially when the sore which it produced had nearly healed, and could not have been productive of much irritation, either local or constitutional. These attacks of secondary dis-

ease, are often exceedingly obscure and insidious in their progress; and as they may produce destructive disorganizations, before the symptoms become so prominently marked as to arrest the attention, we ought, in all such tedious cases, to watch the first manifestations of local changes or constitutional derangement, and be prepared to adopt prompt and vigorous treatment at that stage of the disease, when it is most likely to prove effective. When, from the extent and severity of the burn, a high degree of constitutional irritation has been excited, and so long maintained as to have impaired the health, and produced considerable emaciation, it not unfrequently happens that chronic disease of the alimentary mucous membrane supervenes. This cannot always be attributed to the direct influence of the local affection, but it must sometimes depend on the continued constitutional excitement which the injury has produced. There are many chronic diseases which ultimately lead, in this way, to an inflamed, softened, and ulcerated state of the alimentary mucous tissue; and where the secondary disease is to be referred to the injurious excitement which has been so long maintained. It is in this way I would attempt to account for the fatal termination of the following case:—

Case CXX.—*Severe Burn, succeeded by chronic disease of the intestines—Death.*—M. M'D., æt. eighteen, was admitted on the 2d January, 1832, having had her clothes set on fire a few hours before, when in the police office in a state of intoxication. The back, nates, perinæum, labia, and thighs were vesicated, denuded of cuticle, and in some places charred; the pulse was rapid and indistinct, the thirst urgent, the body cold, and the restlessness great. The parts were put up in cotton, and when the febrile excitement commenced, a purgative was ordered. The pulse continued rapid; she was obliged to lie constantly on her face; and, as her habits were most filthy, and she voided her urine and feces in bed, the sores healed very slowly. From these causes, while the other parts had nearly cicatrized, the right thigh became sloughy, the appetite impaired, and the bowels irritable. Her strength continued to diminish daily; diarrhœa set in, with occasional

vomiting; the countenance became hypocratic, and she expired on the 12th of February.

On inspection, there was found superficial and deep-seated congestion of the brain, with serous effusion under the arachnoid, and into the ventricles. The liver was immensely enlarged and tuberculated; the mucous membrane of the small intestines was injected, tumid, and ecchymosed; the ileo cœcal valve was in a state of ulceration, as were occasional portions of the colon and rectum.

I have sometimes imagined, that, by strict attention to the state of the bowels and skin, I have occasionally succeeded in warding off those destructive attacks of internal inflammation, even when there were present local and constitutional symptoms premonitory of their approach. When, however, this secondary disease is sudden in its invasion, and acute in its form, the symptoms are less ambiguous, and the necessity for speedy and vigorous interference becomes more apparent.

I have, in one or two cases, succeeded in arresting its progress by copious blood-letting, and other antiphlogistic means, but I have oftener failed, as in the following case, in producing the slightest impression on the disease.

Case CXXI.—*Extensive Burn from an explosion of fire-damp, followed by Pleurisy and Death.*—A. M'L., æt. thirty-four, was admitted on the 8th of June, 1831, having had his face, back, arms, and front of his chest burned seven hours previously, by an explosion of fire-damp in a coal mine. The cuticle was almost entirely abraded, and the cutis vera and subjacent parts were brownish-coloured, hard, and charred. He complained acutely of pain; he had slight shiverings; his extremities were cold, and his pulse was one hundred and eight, feeble. The excoriated parts were covered with lint, dipped in warm turpentine, and in an hour reaction was fairly established. On the following day, the chloride of lime was substituted for the terebinthine application, and the patient remained tolerably easy till the 12th, when, after a violent rigor, he was seized with acute pain in the left side of the chest, impeding inspiration, and accompanied with a troublesome, dry cough, great restlessness, and thirst; tongue thickly furred;

pulse ninety-six, hard. There was a discharge of pus from the margins of the sloughs, which had begun to be detached. Was bled to twenty ounces; twenty-four leeches were applied to the pained part; the turpentine liniment was employed, and he was ordered three grains of calomel and one grain of opium every four hours. Notwithstanding a repetition of the blood-letting, and a continuance of the other antiphlogistic means, with the use of smart purgatives, and nauseating doses of emetic tartar, the symptoms were not relieved in the slightest degree. On the contrary, the dyspnœa increased, delirium supervened, and he expired on the morning of the 16th,—eight days from the receipt of the burn, and four from the apparent commencement of the thoracic inflammation.

On inspection, the left side of the thorax contained a pound of sero-purulent fluid, in which flakes of lymph were observed floating; the lung was considerably compressed, and its investing pleura, as well as that portion of the membrane lining the ribs, was of a deep-red colour, and covered here and there with thick patches of shaggy lymph. The inner surface of the pericardium was inflamed, but there was no effusion into its cavity. The mucous membrane of the lungs, stomach, and intestines, was natural.

In the next case, the inflammation which the burn excited ended speedily in gangrene; but the accompanying symptoms, although extremely urgent, did not indicate the exact nature of the lesion, till the period for active treatment had passed.

Case CXXII.—*Severe Burn of the lower half of the body, followed by Inflammation and Gangrene of the Intestines.*—J. G., æt. eight, was admitted on the 25th of January, 1827, two hours after his clothes had caught fire. The integuments covering the abdomen, pubes, and thighs, were abraded, hard, and presented a greyish-brown leathery appearance. The pulse was so rapid and feeble, as not to be counted; the body was cold, and he had rigors. Warm turpentine was applied, and in a few hours reaction was established by hot flasks to the extremities, and the exhibition of the usual stimulants,

after which the bowels were opened by castor oil. On the evening of the 27th, there was a return of the coldness, and tendency to rigor; the injured parts were hard and tense; the respiration quick and laborious; the pulse rapid and feeble; the countenance pale and anxious. He was immersed for a few minutes in a warm bath, and ordered small doses of calomel. On the 31st, there was great restlessness, alternating with fits of drowsiness, approaching to coma; the abdomen was slightly tympanitic, but without pain on pressure; the bowels were loose; there was no vomiting. He expired on the evening of the 3d of February.

On inspection, the peritoneum covering the intestines and abdominal parietes was extensively inflamed, and two gangrenous openings were discovered in the duodenum, near its termination. One of these admitted the finger, and from both a free discharge of feces had taken place into the upper part of the cavity of the abdomen, where it was confined by recent adhesions of the intestines. From the lower part of the cavity, near the pelvis, six ounces of a bloody-coloured viscid fluid were removed. There was a considerable quantity of blood effused around the capsule of Glisson, and between the layers of the omentum. The mucous membrane of the small intestines showed marks of acute inflammation, but only a slight tendency to ulceration was perceptible. The brain was in a state of congestion, and the ventricles contained rather more serum than natural.

Burns, occurring during the period of utero-gestation, are apt to excite premature labour, with or without the presence of abdominal inflammation. In one case which came under my notice, the violent shock of the injury, and the powerful irritation which succeeded it, appeared to derange the uterine circulation, and, by detaching a portion of the placenta, to give rise to repeated and profuse hemorrhage, under which the patient would have sunk, had not artificial delivery been had recourse to. In the following case, when the acute inflammation of the peritoneum consequent on the injury was nearly subdued, premature labour occurred, yet the patient recovered.

Case CXXIII.—*Severe Scald of the Abdomen, succeeded by acute Peritonitis and premature Labour—Cure.*—Mrs. G., æt. forty-four, was scalded with boiling water on the 20th February, 1827, when in the eighth month of pregnancy. The integuments of the abdomen pubes, and upper half of the thighs, were covered with large vesications, which were punctured, and carded cotton applied. The pain continued acute for several hours, but was ultimately relieved by an opiate; the bowels were kept solvent by small doses of castor oil, and the febrile excitement moderated by the use of an antimonial diaphoretic. On the 24th she had a smart rigor, which was followed in a few hours by acute pain in the right inguinal region. This became speedily diffused over the abdomen, and was accompanied with acute pain on pressure, tympanitic swelling, bilious vomiting, constipation, and a small wiry pulse, which ranged from one hundred and thirty to one hundred and forty in the minute. By repeated bleeding, to the amount of fifty-eight ounces, with purgatives and enemata, followed by calomel and opium, the symptoms were gradually subdued, and slight ptyalism excited. On the 28th, when the abdominal pain had nearly disappeared, and the pulse had sunk to about one hundred in the minute, she was seized with slight labour pains, to check which, a large opiate was administered, and afterwards an anodyne enema. These means proving ineffectual, the parturient efforts became gradually more powerful; the membranes gave way, and she was delivered after a severe labour of seven hours' duration. The child was dead, and, what was rather singular, there were several bullæ on its abdomen and thorax, filled with a transparent fluid, without any appearance of commencing putrefaction.

For several days the pulse continued quick and irritable; she had occasional attacks of pain in the abdomen, apparently spasmodic, and there was considerable prostration of strength; but by the use of mild laxatives and opiates, followed by a tonic regimen, she slowly recovered, and, by the middle of March, the burned parts were completely cicatrized.

ON ERYSIPELAS.

By some medical men, Erysipelas is considered, in all circumstances and situations, to be essentially an inflammatory disease, and to be curable only by antiphlogistic means; whilst another class appear equally convinced of its being decidedly asthenic, and have therefore recourse to tonics and stimulants. In the majority of cases, the local appearances, as well as the constitutional symptoms, are sufficiently decisive as to the existence of active inflammation; but, on the other hand, the disease occasionally presents the most satisfactory and undoubted evidence of local and general debility.

Case CXXIV.—*Erysipelas of the Face, treated by tonics and stimulants.*—M. O., æt. forty-six, when admitted on the 6th May, 1826, had the right side of the face affected with an erysipelatous inflammation of a dull red colour, which had commenced three days previously on the right cheek where the cuticle had been accidentally abraded. He was a dissipated and debilitated subject; his pulse was one hundred and twenty, and feeble; the tongue dry and furred; but the skin was cool, and the functions of the sensorium undisturbed. The affected parts were covered with flour, and, after opening the bowels by a mild purgative, two grains of the sulphate of quina were ordered every six hours in an ounce of wine.

On the 8th, the disease had extended over the scalp to the opposite side; the pulse was more rapid and feeble; the pupils contracted and irritable; the tongue typhoid; and there was hiccup, with low muttering delirium and drowsiness. The wine was increased, small doses of the carbonas ammoniæ prescribed, and the quinine continued. In five days the inflammation had ceased to spread; the cuticle desquamated; his strength improved; and he was dismissed on the 28th.

Case CXXV.—*Erratic Erysipelas of the Trunk, supervening on ulcer—Death.*—W. S., a sickly and emaciated chimney-

sweep, about ten years of age, was admitted in the beginning of May, 1826, on account of an ulcer near the upper part of the left thigh, and a large abscess at the knee. He also appeared to labour under an irritable state of the alimentary mucous membrane; he had slight diarrhœa; his tongue was red, dry, and smooth at the edges, but furred and deeply chopped in the centre; the pulse rapid and feeble; and the body greatly emaciated. Four days before his death, which took place on the 3d of June, when the debility was daily increasing, he was affected with burning pain of the scrotum, followed by diffuse dull redness of the integuments, as also around the ulcer of the thigh, with slight swelling and vesication. The inflammation extended over the abdomen and thorax, and in many places it could hardly be distinguished from the surrounding healthy skin.—*Wine and quina.*

On dissection, besides inflammation and ulceration of the mucous membrane of the small and large intestines, there was found both superficial and deep-seated congestion of the brain, with serous effusion in the ventricles.

In the two preceding cases, the disease was confined to the skin; and there was not present either swelling or tension to indicate an affection of the subjacent textures. The great degree of debility that existed, showed the necessity of a purely tonic treatment, and that the adoption of opposite means must have been injurious, if not destructive. It would be easy to multiply examples of a similar kind, but it must be evident, from what has been already stated, that although the disease is always, strictly speaking, accompanied by inflammation, yet it is occasionally met with when, from the trifling degree of local excitement which exists, and the feeble state of the patient, antiphlogistic treatment is decidedly contra-indicated. To have recourse in such cases to local or general bleeding, purgatives or antimonials, would only tend to accelerate the progress of the inflammation, and to aggravate that peculiar condition of the system upon which the original development and propagation of the disease depend. Besides, the actual presence of inflammation does not always warrant us in adopting depletory measures. In scrofula, and particularly in some forms of strumous ophthalmia, although inflammation be de-

cidedly present, we do not hesitate to prefer tonics and stimulants to antiphlogistic means; on the contrary, daily experience teaches us, that the latter class of remedies, if employed to the extent which the local inflammation seems to call for, will often produce the most injurious effects.

I am ready to acknowledge, however, that, in a great majority of cases, erysipelas is most effectually controlled by antiphlogistic treatment, such as venesection, local bleeding, by means of leeches, scarifications, &c.; emetics, purgatives, diaphoretics, &c. These means are generally resorted to in this hospital, and the affected parts are covered with a spirit lotion, unless there exists a good deal of vesication, when dry flour or fleece cotton is applied. In several cases of traumatic erysipelas, I have succeeded, after free vomiting and purging had been produced by the emeto-cathartic mixture, in arresting the progress of the disease, by rubbing the inflamed surface with lunar caustic. By this local stimulus, the morbid action of the part seems to be changed, its extension prevented, and in a few days the blackened cuticle is thrown off, without producing the slightest deformity. I have also attempted to circumscribe the disease when confined to the extremities, by encircling the limb a little way above the seat of the inflammation with a narrow stripe of blistering plaster. This was only successful when the erysipelatous affection was purely cutaneous, and not when the subjacent cellular substance appeared to be in the slightest degree involved.

In phlegmonous erysipelas, I rarely have recourse to general blood-letting, and that only when the patient is young and robust, the pulse full and strong, or when, during the progress of the disease, the meninges of the brain become affected; the propriety of local bleeding, however, can hardly be disputed. For this purpose leeches are freely applied, and when the disease is in an incipient state, and the tumefaction and tension are inconsiderable, its progress may by such means be often arrested. I have only twice had an opportunity of adopting the practice of making numerous small punctures into the affected part, as recommended, and apparently so successfully employed, by Dr. Dobson of Greenwich Hospital.* In one of these cases, the

* Medico-Chirurgical Transactions, vol. xiv., p. 206.

affection was consequent on a wound of the scalp, and was decidedly benefited by this treatment; but in the other, which was an acute case of phlegmonous erysipelas of the leg, more than one hundred punctures were made with but trifling advantage. A considerable discharge of blood was obtained; but, when the punctures penetrated the cellular substance, in order to unload this texture of the effused serum, it was found that many of the openings became speedily closed by the protrusion of minute portions of adeps, by which the farther escape of fluid was prevented, and but little effect was produced on the tumefaction or tension of the limb.

The most powerful and decided method of checking this troublesome disease, is that by incisions into the affected parts, —these being carried through the integuments and cellular texture, and even through the fascia, should the disease appear to have penetrated so deeply. This practice has been almost uniformly adopted during the last ten or twelve years by the different surgeons who have officiated in this hospital, and, so far as I have learned, its results have been eminently successful, and have tended to confirm the favourable statements of Mr. Copland Hutchison,* who is justly entitled to the credit of having first introduced this powerful and efficient treatment. If incisions are employed at an early period of the disease, they remove tension, and, by diminishing vascular action, check the progress of inflammation, and prevent those diffuse and destructive suppurations, with sloughing of the cellular texture, which are so apt to ensue. Even at a more advanced period they are useful, by facilitating the discharge of purulent or sero-purulent fluid, and the separation of sloughs; and they also tend to limit the ulcerative destruction of the integuments. The diminution of the pain, redness, and swelling, is often strikingly visible after this practice has been adopted, and the relief of the constitutional symptoms is seldom less apparent.

Case CXXVI.—*Phlegmonous Erysipelas of the arm cured by incisions.*—A. R., æt. forty-nine, when admitted on the 3d of

* Medico-Chirurgical Transactions, vol. v.

February, 1832, his left arm, fore arm, and hand were greatly swollen, tense, and of a dark red colour, the disease having commenced six days previously without any known cause. The affected parts were hot and painful; there were several large vesications on the inner side of the fore arm, which contained milky serum and greenish-coloured lymph, and on the outer side, in one or two places, obscure fluctuation was perceptible. Four incisions were made through the skin and cellular membrane of the fore arm, (two of these were five inches, and the others two and a half inches in length,) and gave exit to a small quantity of pus. The divided integuments retracted considerably, and the tumid cellular substance, which had a red appearance, bulged out at the incisions. Immediate ease was obtained; the inflammatory appearances and constitutional excitement diminished rapidly; and when the bleeding had stopped, which amounted to twelve ounces, oiled lint was applied to the incisions, and the arm covered with a tepid spirit lotion. In a few days resinous ointment was substituted, and a bandage applied, under which the parts continued to heal slowly.

I am averse to the use of poultices after incisions have been employed. They produce troublesome vesications, or rather, they cause a premature detachment of the skin from the parts beneath, and encourage suppuration and sloughing. Next to the spirit lotion, I have found dry carded cotton to be the most useful and soothing application.

Case CXXVII.—*Phlegmonous Erysipelas of the Leg—Cured by an extensive incision.*—J. O., æt. thirty-five, was seized five days before his admission, on the 3d of May, 1826, with erysipelas phlegmonodes of the right leg. The disease commenced on the dorsum of the foot, and extended to the knee; the parts were swollen, tense, painful, and of a dark red colour; the pulse was frequent and full; the skin hot and dry; and the tongue covered with a brown fur. An incision, ten inches in length, was made through the skin and cellular texture, on front of the tibia, and a considerable quantity of serum discharged. The wound bled profusely; and as faintness was soon induced, it was found necessary to secure a small vessel

by ligature,—the previous attempt to check the hemorrhage by elevating the limb, and applying cold, having failed. The disease was instantly arrested, and no sloughing or extensive suppuration of the cellular texture took place. When the wound was granulating, its edges were approximated by strips of adhesive plaster, and the limb was supported by a bandage. In five weeks a cure was accomplished.

I have attempted, in several cases, to contrast the practice of Mr. Hutchison, who makes a number of small incisions into the affected parts, with that of Mr. Lawrence, who recommends one or two long incisions to be made in a direct line through the middle of the inflamed surface. When the disease extends over an entire extremity, and the tension is uniformly diffused, and so great as to indicate an affection of the subfascial cellular texture, I have experienced more benefit from one or two long incisions, than from smaller and more numerous ones. But when the disease is exterior to the fascia, as most frequently happens, and there exists an unequal degree of swelling and tension in different parts of the affected surface, at some distance from, and not in a direct line with, each other, indicating the presence of gangrene or suppuration, in circumscribed portions of the cellular texture, one or two long incisions have not appeared to me to be so successful in either relieving the urgent symptoms, or checking the progress of the disease, as making a number of small cuts into those detached and distant parts of the inflamed extremity in which the swelling and tension predominate.

When erysipelas affects the head, the skin and subjacent cellular texture are the parts generally affected, and the ordinary antiphlogistic means seldom fail in removing it. But when the disease is seated under the aponeurosis, diffuse suppuration and sloughing are speedily produced, unless prevented by the free and timeous use of incisions. I have seen more than once the neglect of this treatment prove fatal. During the summer of 1826, a robust labourer was admitted into the Infirmary under my care, several days after an attack of phlegmonous erysipelas of the scalp had terminated in extensive suppuration. The head was enormously swollen; the scalp, which was ulcerated in various points, had a spongy or

boggy feel, and was completely detached from the skull. Although incisions were employed to favour the escape of matter and the separation of sloughs, nearly the whole integuments of the head were destroyed by ulceration, and the patient died in a few days from effusion on the brain.

Case CXXVIII.—*Phlegmonous Erysipelas of the Scalp—Cured by incisions.*—A. C., æt. thirty-eight, received a small puncture-wound over the middle of the left parietal bone, on the 7th of February, 1827, and on the 10th he was admitted into the Infirmary. There was a slight blush of redness around the wound, which appeared to be suppurating, and the integuments of the left side of the head were greatly swollen, painful, and œdematous. He complained acutely of pain and throbbing in the head; the pulse was one hundred and eight, and strong; the tongue furred, but moist; the skin hot and dry. He was immediately bled to twenty ounces; twenty-four leeches were applied to the left side of the head, followed by a cold lotion; and free vomiting and purging was produced by the emeto-cathartic solution. On the 11th, the disease had extended to the right side and forehead; the swelling and pain had greatly increased, and the general disturbance was aggravated. Notwithstanding a repetition of the leeching, with frequent doses of calomel and James's powder, the progress of the disease was not arrested. On the 12th, the whole scalp was involved, and the integuments, although little discoloured, were enormously swollen, and pitted on pressure.

As, besides the affection of the subcutaneous cellular tissue, there was also present a considerable tumefaction of the parts under the aponeurosis; and as the ordinary antiphlogistic means had failed in controlling the disease, I made six incisions into the scalp, in various points, each being about two inches in length, and carried through the aponeurosis. Sixteen ounces of blood, apparently arterial, were lost; the pain was immediately relieved, and the swelling diminished rapidly. For several days there was considerable discharge from the wounds, but no sloughing of the exposed cellular substance took place. He left the hospital, quite recovered, on the 2d of March.

While we occasionally meet with cases at an early period,

in which the destructive consequences of erysipelas can be prevented by incisions, it unfortunately happens that the patients are seldom admitted, until, from a continuance of the disease, and a neglect of the proper treatment, extensive suppuration and gangrene of the cellular membrane have been produced. Instead, however, of detailing cases to illustrate this point, several of which have occurred to me, I shall narrate shortly one which supervened on an ulcer, and another which was the consequence of an operation, as in both a fatal termination took place.

Case CXXIX.—*Erysipelas consequent on Ulcer, and terminating fatally.*—M. F., æt. eight years, had been in the Infirmary for several weeks, in consequence of an ulcer on the abdomen, between the pubes and umbilicus, which had nearly healed, when erysipelas commenced on the surrounding integuments, on the 1st of July, 1826. The disease extended rapidly over the abdomen, front and sides of the chest, neck, shoulders, and arms, and the affected parts were hot, painful, of a bright red colour, and, in some places, vesicated. Vomiting and purging were produced by the emeto-cathartic mixture; a few leeches were applied, and afterwards a tepid spirit lotion. On the 2d, she was delirious; the inflammation was extending; the tongue was typhoid; the pulse was rapid and feeble; and the prostration of strength more decided. Wine, quina, and carbonas ammoniæ were ordered; and, during a continuance of the tonic treatment, the inflammation lost its vivid red colour, and ceased to extend. Her strength, however, decreased rapidly; vomiting and hiccup supervened; she became comatose, and died during the night of the 5th, with all the symptoms of typhus gravior.

The only morbid appearances discoverable on dissection, were superficial and deep-seated congestion of the brain, with a slight effusion of serum under the arachnoid.

There is little doubt but that secondary, or hospital erysipelas, when it attacks a wound or ulcer, may be often traced to irregularities of diet, and to local irritation, arising from improper dressing, tight bandaging, exertion, &c.; but although every precaution may have been adopted to avoid these, the

disease not unfrequently supervenes, when its origin and propagation will be found to depend more frequently on constitutional than on local causes. I have already, in the preceding part of these Reports, detailed several operation cases, in which the occurrence of erysipelas was productive of alarming symptoms, and even of fatal effects. These were more prevalent during the summer of 1826, when I first acted as surgeon in the Infirmary, than at any subsequent period. By proper attention to diet, cleanliness, ventilation, &c., and by preventing the wards from being overcrowded, the disease is now less frequently met with, and never in an epidemic form.

Case CXXX.—*Simple Erysipelas of the Hand and Arm after amputation of the finger—Fatal termination.*—An old emaciated Highlander had the mid-finger of his right hand amputated at the metacarpal articulation, on the 2d of May, 1826. Four days thereafter, erysipelas commenced at the wound, and extended slowly over the hand and arm; the redness was less vivid than usual; the swelling was inconsiderable; the heat of the parts was but little elevated; the pulse was feeble, and seldom above ninety; the tongue was covered with a dry brown fur, and the eyes were sunk and suffused; a large slough formed over the sacrum; and before he expired, on the 12th, the erysipelatous inflammation had almost disappeared. Dissection displayed a congested state of the brain, with an effusion of serum under the arachnoid, and into the ventricles.

ON DISEASES OF THE BONES AND JOINTS.

Periostitis, both in an acute and chronic form, is a disease of very frequent occurrence. It may arise from external injury in robust and apparently healthy subjects, or from some internal cause of a less obvious kind, particularly in constitutions tainted with scrofula or syphilis. Of fourteen cases of this disease, which were under my care in the Infirmary, nine were from five to twelve years of age, and almost all of them exhibited the scrofulous diathesis; the remaining five were adults,—three being males, and two females. In eleven of these cases, the affection was confined to one bone, which was most frequently the tibia or femur; but in the other three, two bones, situated in distant parts of the body, were affected. I have also seen it attack the lower jaw, clavicle, humerus radius and ulna, and the bones of the hands and feet, particularly the phalanges. In none was it productive of fatal consequences,—the disease being either checked by early incisions, or removed by amputation. This operation is sometimes requisite at an early stage of the disease, when, from extensive detachment of the periosteum and profuse suppuration, life is endangered; but it is more frequently called for at an advanced period, when necrosis has supervened.

In the acute form of periostitis, the local and constitutional symptoms are extremely urgent; the excruciating pain which is generally deep-seated, the trifling degree of swelling and tension of the part, and the absence of cutaneous redness, are so characteristic of the disease at its commencement, as to make it easily distinguishable from phlegmonous erysipelas or subfascial inflammation, with which it is sometimes confounded. When seen and discovered at this early period, its progress may be speedily arrested by a free incision carried down to the bone, and by the exhibition of calomel and opium. Should suppuration have taken place, and become extensively diffused, the inflammation is gradually propagated from the deeper-seated to the more superficial parts, giving rise to ex-

tensive infiltration of the cellular textures, tumefaction of the limb, discoloration of the integuments, and speedy ulceration. If not timeously arrested, it sometimes extends along the whole shaft of the bone in which it originates, and produces acute disease of the neighbouring articulation; when this happens in a scrofulous subject, the articular cartilages soon ulcerate, the ends of the bone become softened, and amputation will be generally required. In rare cases, the disease may extend beyond the first joint, and thus affect, with equal severity, a bone which is in some measure separated from the one in which the inflammatory action originated. I have seen amputation of the shoulder-joint performed within a fortnight from the commencement of periostitis at the wrist,—the disease having, within a few days, extended along the radius and ulna to the proximal end of the humerus. In another case, which I sent to the Infirmary several years ago, rapid periostitis of the tibia took place in a girl labouring under syphilis, the knee-joint became affected, as also the periosteum covering the inferior third of the femur. Amputation was performed, but the patient died on the fourth day.

It does not necessarily follow, however, that the death of the bone should result from even an extensive detachment of the periosteum. Fistulæ may form and become the outlet to a tedious discharge, but after the acute stage has passed, the re-union of the thickened periosteum and bone may again take place, the sores be healed, and but little deformity or inconvenience produced.

Case CXXXI.—*Periostitis of the Tibia ending in suppuration, with effusion into the knee-joint—Cure.*—J. G., æt. ten, received a blow with a wooden ball over the front of the left tibia, a little above the ankle, nine days previous to his admission on the 17th of July, 1826. The whole leg was swollen, and acutely painful on pressure and motion, especially in the course of the tibia; but there was little tension of the parts, and only a slight redness in the vicinity of the injury. He had a very rapid pulse, great heat of skin, urgent thirst, and vomiting.

An incision, two and a half inches in length, was made over

the front of the tibia, at its inferior third, and carried down to the bone. A quantity of serous fluid and blood was discharged, and a considerable portion of the periosteum was found detached. Lint dipped in camphorated oil was applied to the wound, the limb was kept cool with an evaporating lotion, and he was ordered calomel combined with Dover's powder. The symptoms continued to diminish till the 22d, when, after a rigor, followed by increased febrile disturbance, he began to complain of acute pain in front of the affected tibia, and in the knee-joint. Leeches and cold applications having failed to remove the symptoms, and as the pain and tumefaction were increasing, and there were present a few distinct patches of cutaneous inflammation, with great swelling of the joint, apparently from effusion, a second incision was made on the 24th, a little below the knee, and several ounces of pus discharged. The periosteum was found completely detached from the tibia, the suppuration was rather profuse, the affected knee, which was swollen, tense, and painful, measured three inches more than the opposite one, and he complained of debility and night-sweats. Wine, quina, and nourishing food were ordered; the discharge gradually diminished; the wounds closed; the affection of the knee-joint was removed by repeated blistering and moxa, and a cure accomplished without stiffness or deformity.

When subfascial inflammation commences in a part where little or no muscular substance intervenes between it and the bone, and especially when this terminates in suppuration, and has not been relieved by free and timeous incisions, the periosteum may become involved. This occurrence happened in the following case; and as I had an opportunity of frequently examining this patient for several weeks before his admission into the Infirmary, I was quite satisfied that the periosteum did not become affected till long after the subfascial inflammation had ended in suppuration, and that the propagation of the disease to the bone, was to be referred to the tardy and imperfect discharge of the purulent matter through the fistulous sores, the patient having refused to allow incisions to be made, by which this might have been obviated, and the extension of the disease to the deeper-seated parts prevented.

CASE CXXXII.—*Periostitis of the lower third of the Radius and Ulna, and of the Carpal and Metacarpal Bones, consequent on subfascial Inflammation—Amputation of the fore Arm—Cure.*—P. M'G., æt. fifty-four. Four months previous to his admission, on the 23d of May, 1831, received a small punctured wound on the dorsum of the right hand, close to the metacarpal articulation of the mid-finger, which was followed by extensive subfascial inflammation, copious suppuration, and sloughing of some of the tendons. Several fistulous sores formed, through which the matter escaped slowly, but no affection of the periosteum could be detected, till a month before he was admitted into the Infirmary; when, after a rigor, followed by increased pain and swelling of the hand and wrist, the suppuration became more abundant, and the probe could be passed in all directions, and bare bone discovered. Several incisions were made, but as the patient's strength was greatly impaired, and hectic symptoms were present, it was found necessary to have recourse to amputation. This was performed on the 30th, by transfixing the middle of the fore arm with Liston's knife, and forming two lateral flaps. Union by the first intention took place, and the patient was dismissed, in good health, on the 11th of July.

On examining the limb, all the metacarpal and carpal bones were denuded of periosteum, and some of them softened. There was a collection of pus in the wrist-joint, the articular cartilages were destroyed, the synovial membrane was in a state of hypertrophy, and about two and a half inches of the lower ends of the radius and ulna were necrosed.

Suppuration is seldom the consequence of sub-acute or chronic periostitis. This form of the disease is generally obscure at its commencement, slow in its progress, and comparatively mild in its symptoms. It usually occupies but a small portion of the periosteum, and the attending swelling, although considerable, is in some degree defined. Unless to give exit to matter, it is rarely necessary to employ incisions, the disease being generally curable by leeching and blistering, with the internal use of calomel and sarsaparilla. When the inflammatory action has subsided, there often remains a considerable enlargement of the part, arising either from a morbid

thickening of the periosteum, or a deposition of ossific matter on the surface of the old bone. This may continue for years without undergoing any perceptible change, but should inflammation of the part be re-excited, the bone in scrofulous subjects is apt to become affected. This occurred in a case lately under my care; the tumour on front of the tibia, which had remained in an indolent state for years, inflamed after a slight injury; ostitis supervened, and an abscess formed in the cancellous structure of the bone.

Necrosis is generally the consequence of inflammation of the affected bone, with or without a corresponding disease of the periosteum and surrounding soft parts. When a large portion of the shaft of a cylindrical bone has been destroyed, it comes to act as a source of irritation, and maintain profuse and continued suppuration. Besides this, its long detention is apt to occasion in children, whose bones are soft and spongy, a gradual extension of the disease along the cancellous texture, to the neighbouring joint.

Case CXXXIII.—*Partial Necrosis of the Tibia, and disease of the Knee-joint—Amputation—Cure.*—J. R., æt. five, was under the care of my colleague, Dr. Young, in the Infirmary, for a month previous to the 1st of May, 1826, when he became my patient. The right leg was hard and swollen, particularly in the course of the tibia, and there were three fistulous openings, from which a considerable discharge of pus took place; one of which, about the centre of the tibia, led to a necrosed piece of bone. For several weeks the disease appeared to be confined to the tibia, the integuments covering which gradually increased in size and hardness, and produced a slightly-arched appearance of the leg, but ultimately the knee became swollen and painful on motion. Several abscesses formed around the joint, and were punctured, and his flesh and strength diminished rapidly. On the 11th of July, amputation by the double flap was performed above the knee; the stump healed by adhesion, and he was dismissed in three weeks.

On inspecting the limb, the integuments covering the tibia

were thickened and condensed, the adjoining muscles had a pale red colour, and were covered with a glassy, transparent fluid. The periosteum, which was separated from nearly the whole anterior surface of the tibia, was thickened, spongy, and vascular, and small defined patches of ossification were distinctly visible on its inner surface, at different points, some of these being quite removed from that part of the membrane which retained its natural connexion with the old bone. A sequestrum, about four inches in length, and apparently composed of two-thirds of the circumference of the tibia, was found loose, and was easily extracted, its outer surface having a smooth and natural appearance, while its edges were serrated. The head of the tibia was denuded of cartilage, and carious; its cancellated texture was broken down, and filled with pus,—the disease having been apparently propagated from the cavity which contained the sequestrum, through the centre of the tibia into the joint. The patella was fixed to the outer condyle of the femur, by recent and partial anchylosis.

Had it been possible to have ascertained the size, situation, and detached condition of the necrosed portion of the tibia, previously to the knee-joint becoming affected, there could have been no hesitation as to the propriety of exposing it by a free incision, and attempting its removal; but after this secondary disease had supervened, the great extent of the local affection, and its injurious influence on the system, obviously required amputation.

The state of the diseased parts in this, as well as in other cases of a similar kind which I have examined, was such as to favour the opinion, that the periosteum had been actively engaged in the formation of new bone. In various parts of this membrane, ossific matter was discovered in different states of progression, and in distinct patches, and there could have been little doubt but that a complete bony case would ultimately have formed, had time been allowed for its completion. Had the ossification proceeded from the surface or edge of that portion of the old bone which was still alive, it must have gone on more uniformly, commencing at the healthy bone, and gradually extending, until the process of separation had terminated in the formation of a complete bony case.

The fact, however, of bone having been deposited on the surface of the detached periosteum, and that at a distance from the old shaft, distinctly shows that this membrane, when not completely destroyed or removed, is capable of secreting osseous matter, and of assisting in repairing injuries of the part, whether from accident or disease; and that, although the old bone may be one of the sources of reproduction, it cannot be the only one. This opinion is corroborated, and still farther illustrated, by the following case:—

Case CXXXIV.—*Necrosis of the entire shaft of the Femur, followed by Phthisis and Death—Dissection.*—J. S., æt. thirteen, admitted 15th November, 1826. The whole of the right thigh was greatly swollen; it had a firm resisting feel, and was somewhat tender on pressure; but the integuments were not discoloured. The swelling was greatest in the lower third, where two fistulous openings were situated, from which there was a copious discharge of a thin purulent fluid. These fistulæ permitted the passage of a probe for several inches, in different directions, and denuded bone was discovered. He was unable to walk without a crutch; his pulse was one hundred and sixteen, and feeble; he slept ill; was greatly emaciated; had nocturnal sweats and diarrhœa, which had lasted for five months.

The disease began six months previously, by painful swelling in the lower part of the thigh, which increased slowly for three months, when ulceration of a small portion of the integuments took place, and an immense quantity of matter was discharged. Two months afterwards a second opening formed, when, in consequence of a fall on the affected limb, the pain and swelling increased, and extended to the hip-joint.

In this case, the whole shaft of the femur appeared to be affected. The condyles were also enlarged, and projected laterally to a much greater extent than in the opposite limb. The motion of the head of the bone in the acetabulum was considerably restrained, but this seemed to depend on the great swelling around the trochanters, and the consolidation of the neighbouring soft parts. By enlarging the sinuses, to permit the matter to escape more freely, bandaging the limb, and

administering the decoction of sarsaparilla with soda, and a generous diet, a considerable improvement was effected. On the 7th of December, he had an attack of erysipelas, which commenced at the knee, extended over the thigh, and was accompanied by a rapid and feeble pulse, and great prostration of strength. On the 23d of January following, he was removed from the hospital, his friends being unwilling that amputation at the hip-joint, which was proposed for the removal of the disease, should be had recourse to.

Fourteen months thereafter he died of phthisis, when I had an opportunity of examining the limb. With the exception of three fistulous openings in the upper part of the thigh, one of which was situated over the trochanter major, there was but little change in the external appearance of the disease. The integuments were consolidated, and the different portions of cellular tissue obliterated. The entire shaft of the femur was necrosed from above the trochanter minor to the condyles, and the periosteum was completely separated from it. This membrane was greatly thickened, and almost covered by a deposition of new bone, which, in a few points, was observed to exist in irregular and detached patches, and apparently between the layers of the periosteum. The old bone was smooth, and perforated with a number of small apertures, especially near the knee. It was surrounded by purulent matter, which was found to communicate with the acetabulum, from which, as well as from the head of the femur, a part of the articulating cartilage was removed by ulceration. The head of the bone appeared to be sound, but there was no visible attempt at separation between it and the necrosed portion, to which it was immediately attached: this separation had, however, commenced between the condyles and the shaft.

When the necrosis is partial, the exposed cancelli of the neighbouring healthy bone will no doubt assist, by the deposition of callus, in filling up the void produced by the disease, and restoring the continuity of the parts. But when the whole shaft of a long bone is necrosed, and its articulating extremities only remain, it is unreasonable to suppose, that, from two such distant, detached, and sometimes imperfectly nourished

portions of the old bone, the ossification which is requisite for the formation of a new bony case can possibly proceed.

This case also disproves the opinion of Sir Charles Bell, that amputation at the hip-joint cannot be required for necrosis of the femur. He maintains, that, by performing this operation in the upper third of the thigh, the sequestrum that remains may be extracted from the stump, and a cure accomplished.*

We have no means, however, of ascertaining, with accuracy, the actual condition of the upper part of the old bone. This, although necrosed, may be so firmly adherent to the adjoining healthy bone, and continue so for years, that its removal shall be rendered impracticable. When the disease has therefore extended as high as the trochanters, amputation at the cotyloid cavity, by insuring the complete removal of the affected parts, will afford a better chance of ultimate success than the milder but less effective operation recommended by Sir Charles Bell.

Caries.—This disease frequently occurs in the spongy bones of the hands and feet, and is rarely cured except by the removal of the affected parts. When it is confined to one or two bones, these may be either wholly or partially extirpated; the safety and facility with which this operation may be performed, depending of course on the situation and connexions of the carious bones; but should it prove more extensive, amputation of the extremity will be required. I shall only detail one case out of a good many that have lately occurred to me, in which partial amputation was adopted.

Case CXXXV.—*Caries of the Metacarpal bone of the Ring-finger—Cured by Amputation.*—A. M'S., aged twenty-three, admitted September 27, 1831. A year and a half ago received a blow on the dorsum of the right hand, which produced an abscess over the metacarpal bone of the ring-finger. This was punctured, and a fistula established, through which extensive caries of the bone was discovered. As the swelling and dis-

* Observations on Injuries of the Spine and of the Thigh-bone. London, 1824.

coloration occupied nearly the whole dorsum of the hand, it was with some difficulty I succeeded in ascertaining that none of the other metacarpal bones were affected.

On the 30th, the diseased bone was removed, along with the finger to which it was attached, by transfixing the metacarpal space on each side with a French bistoury, and cutting down from the carpal articulation to the first phalanx. The sides of the wound were retained in close contact by sutures and a bandage. Adhesion took place, and the patient was dismissed, with a neat and useful hand, on the 21st of October.

The metacarpal bone was found on examination to be both necrosed and carious; its proximal half consisted of a thin shell, which was lined by granulations, and contained a loose cancellated sequestrum; its distal end was softened, and loaded with pus.

When the tibia is extensively carious, the super-imposed granulations are usually so soft and flabby, that the existence and extent of the disease can be readily ascertained by the introduction of a probe. It may happen, however, as in the following case, that when the progress of the caries is slow, the soft parts which intervene between the ulcerated surface and the diseased bone, become condensed and almost fibro-cartilaginous in texture, by which means the introduction of a probe is prevented, unless considerable force be employed.

Case CXXXVI.—*Caries of the Tibia—Amputation followed by fatal Dysentery.*—J. M'D., æt. sixty-three, admitted May 24, 1831. The anterior surface of the right leg, from near the knee to the ankle, was ulcerated, and covered by pale-coloured, indolent, and irregular granulations, from which there was a copious discharge of offensive matter. The disease commenced fifteen years before, from a blow, but it was only six months ago that it began to extend or occasion much inconvenience. He was greatly exhausted and emaciated, his countenance was sallow, he had night-sweats, an impaired appetite, irregular bowels, a smooth red tongue, and a quick pulse.

A variety of local applications were employed, which seemed

to produce a slight improvement in the colour of the granulations, but no tendency to cicatrization. On the 29th of June, arterial hemorrhage, to the amount of six or eight ounces, occurred. The blood flowed from the inner side of the ulcer, near its middle, but was checked by a ligature. I succeeded, on the 1st of July, in forcing a probe through the diseased granulations, and detecting extensive caries of the tibia. Amputation was now recommended, but he refused to submit, and left the Infirmary. He was again admitted on the 27th, and on the following day the limb was amputated above the knee, by the double flap operation. On slicing off the ulcerated parts, which presented the colour and consistence of intervertebral cartilage, the tibia was found extensively carious, a considerable portion of its outer shell and cancellated texture being destroyed, but without any appearance of necrosis.

The flaps united, except at the lower angle of the stump, where the ligatures passed out; here the granulations became pale-coloured and flabby, and the discharge so trifling as hardly to soil the dressings. On the 14th of August, diarrhœa supervened, and on the 19th the stools were distinctly dysenteric. The symptoms continued to increase, extreme emaciation took place, and he expired on the evening of the 27th.

On inspection, there were found old adhesions of the lungs to the costal pleura; dilatation of the left auricle of the heart; thickening and contraction of the mitral valve; steatomatous tubercles under the lining membrane of the aorta; great vascularity of the mucous membrane of the small and large intestines, with irregular patches of ulceration in the caput and sigmoid flexure of the colon.

Case CXXXVII.—*Caries of the head of the Humerus—Successful amputation at the Shoulder-joint.*—W. C., æt. thirty-seven, admitted on the 28th of December, 1826. On the upper and outer part of the right arm, immediately below the shoulder, there was a soft globular tumour about the size of the fist, which was covered with dark-red integuments, and fluctuated distinctly. On the anterior part of the joint, three small sinous openings existed, which permitted the probe to pass freely under the integuments, but not to the tumour or to the bone. The

soft parts around the shoulder were much thickened, the motions of the arm were painful, and the power of raising it much impaired. The disease began four years previously, after exposure to cold; and the pain was considered to be rheumatic till nine months ago, when a swelling formed. This burst three weeks ago, and gave rise to the sinuses, soon after which the tumour on the outside of the shoulder was first observed.

On the 29th, the tumour was punctured, and ten ounces of healthy pus discharged; no bone was felt, but on attempting to push the probe through the posterior wall of the abscess towards the joint, it sunk into a substance which felt like cartilage. During the three following months, the sinuses were frequently laid open, and a succession of blisters applied; and as the deltoid was completely undermined, a free incision was made through the centre of this muscle to the bone. On the 28th of April, I proposed at a consultation that excision of the head of the humerus should be performed, which was acceded to. The existence and extent of the disease of the bone were distinctly ascertained, by which it appeared that this operation might be successfully employed. Besides, the patient's health had suffered greatly; he was emaciated, and had a pale and haggard appearance; his pulse was rapid and feeble; he perspired profusely, and his appetite was greatly impaired. He complained of acute pain in the shoulder, especially on motion of the arm; the fore arm and hand were cold and livid, and for more than a month previously no pulsation was perceptible at the wrist, in either the radial or ulnar arteries.

On the following day (the 29th), I was much disappointed to find, when this patient was seated in the operating theatre, that his mind had been biassed against the proposed operation, by the importunity of his friends and *others*, who had represented it to him as an experiment of very doubtful utility. I attempted to remove his objections, but unsuccessfully; and was therefore reluctantly compelled to comply with his request, by amputating the limb at the shoulder-joint. Incisions were made from the top of the shoulder, along both sides of the deltoid, and united below in a semi-circular form. This

large thick flap was then dissected from a dense layer of a semi-cartilaginous substance, which surrounded and appeared to adhere firmly to the bone. The capsular ligament was freely opened, and about eight ounces of pus escaped. The head of the humerus was made to project by carrying the arm forward; an amputating knife was passed behind it, and the operation completed by dividing the remaining soft parts, and forming a flap on the under side. The hemorrhage was easily commanded by pressure over the subclavian artery, and only five vessels required a ligature. The capsular ligament was thickened and pulpy; the cartilage of the glenoid cavity was destroyed, and the bone superficially carious; and there was a large abscess between the axillary margin of the latissimus dorsi and the scapula, which communicated with the joint, by an opening the size of the finger. The removal of all the diseased parts being impracticable, the flaps were secured together by four sutures, and an opening left at the most depending part for the escape of matter; strips of plaster, compresses, and a spica bandage, completed the dressings. On the fourteenth day erysipelas commenced at the shoulder, and extended along the right side of the chest and neck to the spine, where its progress was arrested. For three weeks longer the suppuration was rather profuse, but this gradually subsided, and he left the Hospital in good health, about the middle of June.

On examination, the head of the humerus was found denuded of cartilage, and in a state of caries. The neck of the bone, its tubercles, and about two inches of its shaft, were covered with a substance resembling softened cartilage. This was found particularly abundant over the neck and tubercles of the bone, and on attempting to remove it several osseous fragments were found on its inner surface. These appeared to have been detached from the humerus, the surface of which, with the exception of the head, was covered with hard and irregular portions of new bone. When the humerus was sawed in a longitudinal direction, a cancellated sequestrum, about the size of a nut, was discovered immediately under the larger tubercle, through which there was a small opening into the centre of the bone.

In this case there existed both caries and necrosis of the humerus. The disease had probably commenced in the substance of the bone, which would account for its slow progress; and the absence of any distinct swelling of the soft parts, for so long a period after the pain, and impaired mobility of the joint, indicated the presence of some deep-seated affection. The thickened membrane which surrounded the diseased humerus appeared to be the periosteum, which continued not only to retain its natural attachments to the old bone, but was also firmly adherent to the different points of recent ossification. The cellular structure of the head of the humerus was exposed and penetrated by the disease, but in the affected part of the shaft the caries was quite superficial, being confined to the surface of the bone. The ulcerative process, which had destroyed several portions of the outer shell, appeared to have been arrested; and here the reparatory process was nearly completed by the deposition of new bone. In such a case, the existence of new osseous formations on the surface of a bone which had been carious, clearly shows that the disease has been checked in that situation; it would not therefore, I conceive, be necessary in excising a diseased joint to remove the whole of the shaft, because it was covered by recent and irregular ossification. In the following case, a considerable portion of the humerus thus affected was allowed to remain, without producing the slightest inconvenience.

Case CXXXVIII.—*Caries of the Elbow—Cured by Excision of the joint.*—J. M'D., æt. twenty-two, admitted September 29th, 1831. Thirteen months previously was attacked by acute inflammation of the right elbow-joint, after exposure to cold, for which she underwent a variety of treatment, during a residence of eight months in the Infirmary, and was dismissed with a swollen and partially stiffened joint, the arm being in the extended position. Two months ago the joint became acutely painful on the slightest motion, which was followed by increased swelling and discoloration of the surrounding integuments, and the formation of an abscess above the internal condyle; this degenerated into a sinus, through which the probe could be introduced into the joint, and carious bone detected. The

affected elbow measured about three inches in circumference more than that of the opposite arm; acute pain was produced by pressing together the articulating surfaces of the bones, and the arm, which was extended, admitted of such a degree of motion only as showed that anchylosis had not taken place.

From the acute symptoms, and the appearance and shape of the joint, it was evident that the articular cartilages were ulcerated, and the bones carious. This became still more obvious a few days after her admission, when a fluctuating tumour over the olecranon was punctured, three ounces of ill-conditioned pus discharged, and a probe introduced into the joint and disease of the humerus, and ulna detected. Her health had suffered considerably; the pulse was quick and sharp; the appetite impaired; and she had profuse night-sweats.

A natural cure could have been accomplished only by anchylosis, a termination of caries of the elbow-joint, which in young and scrofulous subjects is by no means uncommon, and which is certainly preferable when the arm has been retained in a half-bent position, to the artificial joint consequent on excision of the diseased ends of the bones. As, however, the extent of the disease, and urgency of the symptoms, rendered the cure by anchylosis exceedingly improbable, and as the patient was anxious to have her arm amputated, I proposed, at a consultation on the 3d of October, that excision of the elbow-joint should be adopted. This operation had not yet been performed in this Hospital, but it appeared to my colleagues and myself, that this case was favourable for its employment.

On the 9th, the patient being laid on her face on a table, the arm secured in a proper position, and the brachial artery compressed by an assistant, a transverse incision was made from the one condyle of the humerus to the other, on a line with the upper edge of the olecranon. This incision was made more free and extensive than that usually recommended, in order that the end of the humerus, which was considerably broader than natural, and was covered by hard and thickened integuments, might be more readily exposed, and the subsequent steps of the operation be thus facilitated. Care was necessary, however, to avoid wounding the ulnar nerve, which was pulled aside by an assistant. A longitudinal incision,

three and a half inches in length, was then made on a line with the internal condyle; and another of the same extent, and in the same direction, on the outside,—thus forming, with the transverse one, an exact representation of the letter H. The two flaps were dissected close to the bones, and the posterior part of the joint exposed. The olecranon, which contained a carious cavity, was divided by Liston's forceps; the lateral ligaments were cut across, and the soft parts, which adhered firmly to the front of the humerus, were cautiously separated for about one and a half inches upwards, by carrying the bistoury close to the bone. The end of the humerus was grasped in the left hand, and its shaft sawn through immediately above its posterior fosa. On bending the fore arm, and ascertaining that the coronoid process of the ulna, and the head of the radius, were carious, their connexion with the neighbouring soft parts was divided, and the diseased portions of both bones were removed by a common saw. The ends of the radius and ulna thus exposed, had a healthy appearance, but the cancellated texture of the humerus was softened and loaded with pus, while the outer surface of the bone, for more than an inch above the point of its division, was rough and irregular, from the deposition of new bone. These diseased appearances were not, however, of such a nature as to warrant the removal of a farther portion of the humerus. I did not hesitate, therefore, to allow this apparently unsound part to remain, because I had frequently done so in amputation at the lower part of the thigh for caries of the knee-joint, without in the slightest degree retarding the healing of the stump. But little blood was lost, and only one small vessel required a ligature. The edges of the wound were retained in contact by several sutures, compresses, and a bandage, and the arm placed in a sling in a semi-bent position.

On examination, the excised portion of the humerus was found denuded of its articular cartilage, and extensively carious. It measured two inches in length, and nearly three in breadth; and besides the excavations which the disease had made in the inner condyle, the bone was irregular and thickened, especially on its anterior aspect, from a recent deposition of osseous substance. Two inches and a quarter of the ulna

were removed, which bone was still more diseased than the humerus; the head of the radius was also carious.

The dressings were removed, and the sutures cut out on the 14th, when more than two-thirds of the wound had adhered. On the 19th she had a rigor, which was succeeded by febrile excitement, acute pain in the arm, and erysipelas, which gradually extended over the arm and fore arm. By cold lotions, purgatives, and antimonials, the cutaneous redness had disappeared on the 24th; but after another rigor on the 25th, it again returned, and was accompanied with a rapid and feeble pulse, a sharp and anxious countenance, dyspnœa, and cough. She had a third attack in the beginning of November, which gave rise to rather profuse suppuration; this, however, did not continue longer than three or four days. Her strength was gradually restored by quina, wine, and nourishing diet, and the wound closed slowly. Two small fistulæ, arising from disease of the soft parts, but unconnected with the bones, having remained open till the beginning of January, she was detained in the Hospital till March, that I might have an opportunity of observing the improvement which took place in the motions of the affected arm. When dismissed, she was in excellent health, and could perform pronation and supination. She had the complete command of her hand, and could carry a body of several pounds weight, without inconvenience, but she had not regained the power of either flexing or extending the fore arm.

Since the time of Park and White, the removal of diseased joints by excision, has been, until the last three or four years, altogether neglected in this country. Its practicability and safety, especially for diseases of the shoulder and elbow joints, have been, however, completely established by Mr. Syme of Edinburgh, who has the credit of reviving an operation, which, if judiciously employed, will supersede, in many cases, the necessity for amputation. When applied to the elbow, it is certainly a more tedious and painful operation than that of amputation; but so far as it has been hitherto tried, it does not appear to be more dangerous. If the disease is confined to the articulating ends of the bones, these may be removed; but is the arm, thus saved, found to be actually useful in after life?

This question, I conceive, does not yet admit of a satisfactory solution. It would appear, however, that in the majority of the cases in which it has been practised, the space between the ends of the bones, which, in excision of the elbow-joint, will be seldom less than three inches, is slowly filled up by a tough ligamentous substance, to which some of the divided muscles become adherent, and that an artificial joint is thus formed, and a certain degree of mobility and power restored to the limb. I am therefore inclined to think, that excision of the bones in caries of the elbow-joint is an operation not to be hastily condemned, but that it is fairly entitled to an impartial and extended trial, that its merits or defects may be more completely and satisfactorily established.

Case CXXXIX.—*Scrofulous disease of the Knee-joint—Amputation of the Thigh—Secondary hemorrhage on the eleventh and on the twenty-second days—Ligature of the Femoral Artery—Cure.*—R. H., æt. forty-two, admitted 25th November, 1831. The right knee was stiff and swollen, but the swelling was not so great as to obscure the natural shape of the articulating ends of the bones. The femur was partially dislocated inwards, and the leg, which was greatly wasted, was bent to a right angle with the thigh, in which position it had been for more than twenty years. Except lameness, the disease was not productive of much pain or inconvenience till June last, when, after an attack of influenza, an abscess formed on the outer side of the knee, and gave rise to four sinuses, which continued to discharge scrofulous matter. Through one of these, the probe could be passed into a carious opening in the head of the tibia, which evidently communicated with the joint. He had been confined to bed for five weeks, during which time he complained of acute pain in the calf and heel, and his health and strength had suffered considerably. He had a scrofulous appearance, and complained of rigors, followed by flushings and perspirations, with restless nights, a defective appetite, and a short cough; the pulse was one hundred and twenty. Several of the cervical glands were swollen and painful.

On the 27th, amputation by the double flap was performed,

about three inches above the knee. But little blood was lost; and on the application of eight ligatures, the hemorrhage was found to be completely arrested. The integuments surrounding the diseased joint were thickened, and the cellular texture obliterated. The synovial membrane was hypertrophied and gelatinous, and both condyles of the femur were partially anchylosed to the head of the tibia. The joint was filled with scrofulous looking matter; nearly the whole of the articular cartilages was destroyed. There was a large carious cavity in the head of the tibia, near its outer edge, and the cancellous structure of the femur, except where fixed by anchylosis, was extensively destroyed, softened, and loaded with a purulent fluid of a red colour, which contained small portions of a soft cheesy substance, similar to the matter of a scrofulous abscess.

When the stump was undressed on the 1st of December, the flaps were found closely adhering, except at the lower angle where the ligatures passed out. The adhesion was in fact so perfect and complete, that it was with difficulty the line of union could be discovered. On the 7th, all the ligatures had separated, and there only remained a small opening at the upper and lower angles of the stump, from which there was a trifling discharge. His strength was improving daily, his appetite was good, the perspirations had ceased, and the pulse become calmer. On the 9th, at half-past four, P.M., arterial hemorrhage took place suddenly from the stump, but was arrested by the application of a tourniquet, after about a pound of blood had been lost. It produced a good deal of exhaustion and alarm to the patient; his face became pale, and the pulse rapid and feeble. When the dressings were removed on the 10th, the face of the stump was covered with coagula, and there was evidently a considerable quantity of blood effused under the flaps, which could be pressed out in a semi-fluid state, through the opening at the upper angle. For several days there was a profuse discharge of fetid pus and blood, which however gradually diminished, when his strength began to improve, under the use of nourishing food, quina, and small quantities of wine. On the 19th, at seven, A. M., while moving himself in bed, the hemorrhage recurred; but, before more than five or

six ounces of blood were lost, it was arrested by compressing the femoral artery above the origin of the profunda. He was delirious for several hours after, his countenance expressed anxiety and alarm, and the action of the vascular system was fearfully excited.

At two, P.M., a consultation was held, and the stump examined. Large clots of blood were removed from under the dressings; the edges of the flaps were firmly adhering together, but the outer one appeared to be separated from the bone, and distended, by a quantity of coagulated blood. The hemorrhage had ceased; but as the patient was greatly exhausted, and a recurrence of the bleeding might be expected, it was agreed to tie the femoral artery above the origin of the profunda. To this operation he at first refused to submit, and his consent was only obtained after much importunity was employed, and he had become fully aware of the danger of his situation.

When removing him from his room to the ward where the operation was performed, a renewal of the bleeding took place from the lower opening of the stump. An attempt to arrest this, by compressing the femoral near the stump, failed; but when the pressure was applied to the same vessel in the groin, the desired effect was immediately produced: showing distinctly that the bleeding did not proceed from the mouth of the femoral, but probably from a branch of the profunda. The external iliac was compressed by an assistant during the whole time of the operation, to prevent the patient, in his state of exhaustion, from losing any more blood. The artery was exposed, and tied with a single ligature, about half an inch below Poupart's ligament, where it was covered by a cluster of enlarged lymphatic glands. A suture was inserted, and the wound dressed with straps, compress, and a spica bandage. The wine was discontinued, and an anodyne ordered at bedtime.

On the 23d, the dressings were removed, the suture cut out, and the wound found adhering. The discharge was profuse, and the suppurating cavity extended for three inches along the lower and outer part of the thigh. The pulse was one hundred and forty, and feeble; the countenance sunk, and the appetite greatly impaired. The stump had now lost its plump form and fleshy feel; the muscular parts of the flaps seemed

to have totally disappeared; the end of the bone began to project opposite the centre of the inner flap, fully an inch and a half from its junction with the outer one; the integuments gradually inflamed, and, on the 31st, the edge of the bone was observed to protrude through an ulcerated opening. On the 3d of January, the ligature separated from the femoral artery, being the sixteenth day from its application. The discharge from the stump did not exceed three ounces at each dressing, and his strength and appetite were improving, under the use of wine, quina, and nourishing diet. On the 8th, there was an increased discharge of pus from both angles of the stump, and of a serous fluid, like whey, by the side of the bone. This continued rather profuse for a fortnight, during which time there was no improvement of his health. He complained acutely of pain in the stump, his pulse was rapid and irritable, his countenance pale and anxious, his mind desponding, and upon the whole it appeared very doubtful whether his strength could possibly be sustained under the tedious and profuse suppurations which were still going on. The necrosed portion of the femur exfoliated on the 26th, after which the discharge was less abundant; his strength began to improve slowly; and although an abscess formed in the lower part of the thigh, close to the tuber ischii, and another under the edge of the sartorius, which communicated with the wound in the groin, yet a gradual improvement continued to take place, and he was dismissed cured, and in tolerably good health, on the 7th of March.

At the distance of twenty years from the commencement of the articular disease, it is somewhat difficult to ascertain the exact part or texture in which the morbid action originated. It is probable, however, from its slow progress, and the absence of acute pain and tumefaction, that the cancellous texture of the articulating ends of the bones was first affected, and that from thence the disease was propagated to the cartilages, synovial membrane, and surrounding soft parts. In this scrofulous state of the bones, the quantity of their earthy matter is diminished, their texture becomes softened, vascular, and loaded with pus, and not unfrequently large cavities are formed by ulceration, which morbid action sometimes penetrates deeply

into the spongy structure of their articulating extremities. Until this is arrested, we cannot expect that new ossific matter will be deposited, and anchylosis produced. This termination is exceedingly rare in a truly scrofulous disease of the bones; but that it may occur to a certain extent is obvious from the state of the joint, as described in the last case. Both condyles of the femur were joined to the head of the tibia by osseous matter, whilst the central parts of both bones exhibited all the characters of scrofulous ulceration, and were deeply affected. I have only met with another case in which a similar termination took place. The disease had existed seven years, when the symptoms gradually subsided, and anchylosis was established. This bony union was confined to the outer margins of the condyles, and head of the tibia, where the disease seemed to have been superficial; but in the centre part of both bones, it had penetrated more deeply, and produced two cavities, each of which could contain a walnut. The progress of the disease had been long arrested, and these cavities were lined with an opaque, organized membrane, which adhered intimately to the bone, had a smooth and polished surface, and was nearly as tough as ligament.

The first attack of secondary hemorrhage, on the eleventh day after amputation, was not preceded by any unusual suppuration of the stump. On the contrary, the margins of the flaps were firmly united, and there was only a trifling discharge of pus from the lower angle, where the ligatures were brought out. After this occurrence, however, the accumulation of blood within the stump produced a large suppurating cavity, and caused the wasting of the flaps, the projection of the bone, and the ulceration of the integuments,—all these circumstances being aggravated by the scrofulous habit of the patient. When the hemorrhage recurred on the twenty-second day, it became necessary to consider what was the most efficient method of arresting it. To have separated the flaps, which had been firmly united for a considerable time, and to have searched for, and attempted to secure a bleeding vessel in an unhealthy and profusely suppurating cavity, would have been a dangerous and reprehensible practice. Even had the bleeding point been readily ascertained, it would have been difficult, if not impos-

sible, to have fixed a ligature on parts ulcerated and softened, at least so long as to have insured that obliteration of the vessel upon which the safety of the patient, and the prevention of the hemorrhage, would depend.

The application of a ligature to the femoral artery was, therefore, the only procedure which held out the slightest prospect of success; but it still remained doubtful at what part of its course this vessel ought to be secured. Had the bleeding taken place when I was present, I should have attempted, and probably have succeeded in establishing this point, by ascertaining at what part of the thigh it could have been arrested by pressure. This was done when the patient was laid on the operation table, but not till it had been determined to tie the femoral in the groin, so as to cut off the direct circulation of the profunda, and thus diminish the chance of further hemorrhage. This operation, however, is not always successful, the bleeding being apt to return when the collateral circulation is fairly established, by means of the inosculations of the ischiatic and glutæal arteries with the profunda.

Scrofulous diseases of the joints, whether of an acute or chronic kind, are sometimes the means of preventing the internal organs from becoming affected, or at least of suspending the progress of these disorganizing actions, should they have already commenced. It has been also observed, that when the primary or articular disease has been of long continuance, and has ultimately required amputation, the internal or secondary one, which was previously in a dormant state, has sometimes become rapidly and fatally excited. This happened in the following case, which points out the insidious nature of these internal affections, and the necessity of establishing the most rigid scrutiny into the condition of all the important organs of the body, before we subject our patients to the pain and hazard of an operation.

Case CXL.—*Scrofulous disease of the Knee—Amputation followed by speedy death, from an affection of the Lungs and Heart.*—A. F., æt. twenty-four, admitted 5th April, 1827. The left knee-joint measured two and a half inches in circum-

ference more than the opposite one; the articulating ends of the bones preserved their natural shape, but appeared considerably swollen, and there was a soft and slightly elastic swelling around the patella. On the inner side of the knee, a probe was easily passed through the indolent and whitish granulations, which occupied the site of a caustic issue, down to the head of the tibia, and its cancellous structure found to be carious. There were also several sinuses in the lateral and posterior parts of the joint, but although these passed deeply into the soft parts, no diseased bone was detected. The pain of the joint was acute, and increased on motion; the pulse was one hundred and forty, and sharp; he had frequent flushings, and occasional perspirations; and for three weeks he had had a slight cough, but without expectoration or dyspnœa. He was much emaciated, slept ill, and had a scrofulous appearance, but his appetite was good, and his bowels regular.

The disease commenced sixteen months previously, but was productive of only slight pain and lameness during the first eight months, after which the symptoms were aggravated, and his health and strength became impaired.

The state of the joint demanded immediate amputation. This was performed on the 10th, by the double flap, the chest having been previously examined by an expert Stethoscopist, and no disease detected. On inspecting the knee, the synovial membrane was found thickened and pulpy, its inner surface was florid and vascular, and the cellular texture by which it was united to the external parts, was filled with coagulable lymph; the articular and semilunar cartilages were nearly destroyed by ulceration; the cancellous texture of the head of the tibia and condyles of the femur, was extensively carious, and so softened as to be readily cut with a scalpel.

On the 12th he was seized with diarrhœa and tenesmus, which were with difficulty checked by opium, Dover's powder, anodyne enemata, and attention to diet. He had no abdominal or thoracic pain, the cough and perspiration had ceased, his breathing was free and natural, and his appetite was improving. The only unfavourable symptom, was the continued quickness of the pulse; but as this might have depended on the operation which had been so recently performed, it could not, in the ab-

sence of all the pathognomonic symptoms of pulmonary disease, afford any reasonable grounds for an unfavourable prognosis. He had a severe attack of bilious vomiting on the morning of the 14th, which was checked by effervescing draughts, with opium. At the hour of visit, when the stump was undressed and found united, he was evidently more exhausted than formerly; his pulse was one hundred and forty, and feeble, and he complained of weakness and thirst; but after a minute examination, I could detect no symptom except a slight tympanitic swelling of the belly, to indicate the existence or situation of internal disease. At seven o'clock, P. M., he became suddenly insensible, and died in half an hour.

On inspection, the mucous membrane of both the small and large intestines was in a state of congestion, and in some places it was softened and ulcerated, the mesenteric glands were enlarged, and there was a considerable effusion of straw-coloured serum into the abdomen and pelvis. The lungs, which adhered intimately to the costal pleura, were filled with tubercles, varying in size from a mustard-seed to a walnut, some of them being hard and compact, whilst others which had coalesced together were softened, as was the parenchymatous substance surrounding them. The inferior lobe of the right lung was hepatized when cut into purulent matter, and a viscid bloody fluid could be squeezed out from innumerable points. The pericardium was closely adhering to the heart, but easily separable by a little force; and when detached, its inner surface had a shaggy appearance. The heart was soft and pale-coloured, but of a natural size.

The chief interest of this case arises from the fact, that the internal disease, which was both extensive and complicated, was not indicated by the presence of a single diagnostic symptom. From the advanced state of the morbid changes, as discoverable on dissection, it must be obvious that the disease had existed before amputation was had recourse to; but that this operation accelerated the fatal event, will hardly admit of a doubt.

Having extended these desultory remarks on the diseases of the bones and joints, to a greater length than I originally in-

tended, and having detailed all the fatal cases, and a few of the most interesting which required amputation, I shall now, instead of entering on the other forms of articular disease, and stating my experience regarding their treatment, conclude this section by a remark or two on the superiority of the double flap over the circular method of amputation.

All the amputations of the arm, fore arm, and thigh, are now performed in this Hospital by the double flap, without the application of a tourniquet, and have been so, with very few exceptions, by the different acting surgeons during the last eight years. The success with which this mode of operating has been employed, and the excellent stumps which have been formed by it, have now convinced every unbiassed observer here, of its decided superiority over the usual method by circular incisions. The ease and rapidity with which it can be performed, only two rapid sweeps with the knife being required for the division of the soft parts, may be strikingly contrasted with the numerous incisions and dissections which render the old operation so tedious, complicated, and painful. Its chief advantages, however, will be found to depend on the complete covering of muscular substance which it gives to the bone, by which means adhesion is promoted, tedious suppuration and protrusion of the bone is usually prevented, and, above all, a round fleshy stump is formed, which becomes more useful in after life, by its being better fitted for sustaining the pressure of an artificial limb. The divided muscles covering the end of the bone, from their being less actively exerted than formerly, become, to a certain extent, absorbed; but I have found, on lately examining stumps formed by this operation, at the distance of six or seven years, that the wasting of the flaps was so trifling, that this circumstance could not be considered in the light of an objection. The oblique direction in which the arteries are divided, and the consequent difficulty of securing them, has also been started as an objection against this mode of operating. I have never seen or experienced the slightest difficulty in picking up and tying the bleeding vessels; on the contrary, the ease with which the flaps can be turned aside, and every point of the stump examined, render the securing of the arteries of much easier accomplishment in this, than in

the operation by circular incisions. It sometimes happens, however, when this mode of amputation is adopted in muscular limbs, and especially when it is performed near the hip or shoulder joints, that the integuments retract considerably beyond the divided muscles, which bulge out in large masses, and render the accurate approximation of the flaps exceedingly difficult, and at times impracticable. In one case I succeeded in preventing this, by turning the cutting edge of the knife outwards, after the limb was transfixed, and by dividing nearly one-half of the muscular substance transversely, which was done without cutting almost any of the integuments, after which the flap was formed in the usual manner. The same thing was done on the inside of the thigh, by which the usual redundance of muscle was avoided, and an excellent stump formed.

ON LUPUS.

This disease is met with in two different forms. The first and most common variety commences in a slight papillary enlargement of one or more of the sebaceous glands and follicles of the nose, cheek, or lip, which parts soon assume a dark-red or livid colour. They are at first indolent, but gradually become itchy and painful, ulcerate on the surface, and discharge a thin ichorous fluid, which, on exposure to the air, becomes concrete; thus forming, over the whole affected surface, crusts or scabs of a yellowish or dark-brown colour. These soon separate, and new ones are reproduced; and if the disease is not checked, it gradually extends, and more complete ulceration ensues, by which the original characters of the affection are modified, and in some measure obscured. The ulceration, however, is generally superficial, being rarely deeper seated than the skin, or accompanied with much swelling of the surrounding soft parts; and it seldom produces the ravages or deformity of the second species, which I shall now shortly describe. The sebaceous glands and follicles are here also the seat of the disease; but in general there is only one tubercle, which enlarges slowly, assumes a purple or violet colour, has a broad, firm, and indolent base, and presents many of the characters of a small carbuncle. This lupoid tubercle is slow in its progress, and may remain for a considerable time discoloured and indolent before ulceration takes place. In one case that came under my notice, the tumour, which was the size of a walnut, resisted every kind of treatment, for fourteen months previous to the occurrence of ulceration. When this process does commence, however, it spreads deeply, and produces great destruction of the soft parts, as well as of the cartilaginous and bony structures with which it comes in contact. I have seen the nose, the upper and lower lips, the cheek and the right eye, completely destroyed by it, with the nasal, and a portion of the superior maxillary bones.

Case CXLI.—*Lupus affecting the Nose, upper Lip, Cheek, and Throat—Cured by Arsenic.*—C. M'K., æt. nine, was admitted into the Royal Infirmary, on the 4th of January, 1831, where she remained under the care of Dr. Perry till the 1st of May following, when she became my patient. The upper lip, and the apex and alæ nasi, were covered with yellowish scabs, under which the ulcerated surface had a florid papillary appearance, and discharged a thin matter. She had some difficulty in swallowing, in consequence of great swelling and irregularity of both tonsils. These glands were greatly thickened, superficially ulcerated, and tuberculated; and to the left one, the uvula, which was also enlarged, was firmly adhering. A part of the septum and right ala nasi was destroyed. The ointment of the iodide of mercury, which had been used for several weeks without advantage, was discontinued, and a solution of the white oxide of arsenic, containing six grains of the mineral to an ounce of water, was ordered to be applied to the ulcerated surface twice daily. This application was continued for several weeks, during which time small doses of Fowler's solution of arsenic were administered. The parts cicatrized several times, but only a few days elapsed till the ulceration returned. At length, however, two applications of the actual cautery, followed by the arsenical lotion, produced a more permanently healthy action, and she left the Infirmary, cured, on the 17th September.

I have great faith in arsenic as a local application in lupus, and am in the habit of employing it for two different purposes. When used as a stimulant, it must be applied in solution, but when an escharotic effect requires to be produced, the white oxide mixed with an ointment, or made up in the form of paste, is laid over the affected surface. Dupuytren has frequently observed, that when the arsenical paste is applied to lupous ulcerations, extensive erysipelas of the surrounding integuments is not unfrequently produced, and he therefore prefers applying the proto-chloride of mercury in powder, which he says is free from this objection, and gradually but steadily changes the morbid state of the parts, acting more as a specific than a caustic. Although I have never seen the arsenical paste give rise to erysipelas, yet in two cases in which the

ulcerated surface was extensive, its application was followed by severe inflammation of the gastro-enteritic mucous membrane, apparently in consequence of its absorption into the system; and in another case, the slough which it produced penetrated so deeply as to expose the cartilage of the nose, a portion of which exfoliated. When, however, the diseased surface is small, and the lupus exists in the form of tubercle, the arsenical paste may be employed, not only with safety, but also with marked advantage, for it destroys the ulcerated surface and the surrounding induration more completely than can possibly be effected by applying it in solution. But in every other state of the disease, the latter formula is the safest and most efficient,—its strength being so regulated as to produce either a stimulant or escharotic effect. I have employed it for the latter purpose in several cases, and have never seen the most concentrated solution, even when applied to irritable and extensive surfaces, produce local mischief or constitutional disturbance.

The other stimulating applications which I have employed with most advantage, are the actual cautery, and a solution of mercury in strong nitric acid. The red-hot iron has a powerful effect in changing the morbid action, producing healthy granulations and speedy cicatrization. I have employed it in several cases of lupus with decided benefit, and am in the habit of doing so with similarly good effects in other forms of ulcer, both indolent and irritable. I have only once employed the "*nitrate acide de mercure*," which Richerand and Cloquet have found so frequently useful when other applications had failed. It produced a slough, which was three times removed, when a cure was accomplished. In this case the right nostril was nearly shut up by an enlarged, ulcerated, and granular state of its mucous membrane. This diseased state was removed, and occlusion of the external aperture prevented by the introduction of sponge.

In the following case, however, the obstruction of both nostrils was complete, and the deformity had to be removed by an operation :—

Case CXLII.—*Lupus affecting the Nose, Cheeks, and upper Lip, and producing obliteration of the Nostrils—Removed by an operation.*—W. M., æt. eighteen, was admitted on the 21st of March, 1826, under the care of Dr. Young. The disease had existed above eighteen months, with the exception of two or three weeks in the summer of 1825, during which time its progress was arrested by local and constitutional treatment. It commenced nearly at the same time on the nose, cheeks, and centre of the upper lip, by dark redness, tumefaction, and itchiness, to which ulceration slowly succeeded. The parts became covered with thick scabs of a yellowish-green or dark-brown colour, which extended along the septum nasi, and were accompanied with a purulent discharge from the nostrils. Three applications of the actual cautery, and the use of resinous ointment as a dressing, seemed to have produced a cure; but, on the 1st of May, when I took charge of the surgical wards, I found that the diseased parts, although covered by a delicate, smooth, and glistening cuticle, were elevated, irregular, and apparently unsound. Accordingly, in a few days ulceration recommenced, a yellowish-coloured gluey matter was secreted, and scabs formed, which remained adherent for a day or two, and then dropped off, but were speedily renewed. By the use of the arsenical lotion and Fowler's solution internally, a gradual improvement took place, and he was dismissed, cured, on the 26th of June.

On the 24th of August, he received a smart blow on the nose, which again gave rise to the disease. When he applied at the Infirmary on the 16th of February, 1827, the external parts were healed, but the opening into both nostrils was completely obliterated by the firm union of the alæ with the septum. These parts were separated by thrusting a narrow bistoury in the direction of the nostril, and dividing the adhesions, which were firm and extensive. Sponge tents were afterwards introduced; and when these were discontinued, the parts healed under the daily application of a solution of the nitrate of silver.

Although lupus may be purely local in its origin, yet it sometimes happens that its continuance is prolonged, and the

cure materially impeded by constitutional causes. I have seen, both in the Infirmary and in private practice, several children labouring under this disease, who had been subject for years to psoriasis, tinea capitis, or other cutaneous complaints. It has been also observed to prevail most obstinately among those of a scrofulous diathesis, especially while labouring under enlargement of the lymphatic glands, affections of the bones, chronic ophthalmia, tabes mesenterica, &c. According to M. Rayer, it has been at times particularly prevalent among the poor in some parts of France, from scanty and unwholesome nourishment; and in this city, during the years 1818 and 1819, when the working classes were exceedingly ill fed, I had occasion to see a greater number of cases among the poor in the district which was then under my care than at any former or subsequent period. These facts are sufficient to show the necessity of combining constitutional with local treatment. With this view I generally order Fowler's solution of arsenic in small doses; but I have sometimes found it necessary to prescribe the muriate of mercury, dissolved in a bitter tincture, such as that of cinchona, colomba, or gentian, so as to produce a mildly-alterative effect.

Case CXLIII.—*Tubercular Lupus of the Nose and upper Lip—Mistaken for Cancer.*—W. P., æt. forty-four, was sent from the Highlands,—a distance of ninety-six miles,—to have an operation performed on his face, the disease having been certified by his surgeon to be of a cancerous nature. On the 14th of June, 1826, when he presented himself at the Infirmary, fully two inches of the central portion of the upper lip were destroyed by ulceration. This sore had an angry look, its edges were thin and ragged, its surface was irregular, and covered by a greyish-coloured secretion, through which small purple granulations were visible; the discharge was bloody and fetid, and the surrounding integuments were livid, indurated, and the seat of darting pains. The nose was covered with a number of small but prominent tubercles, to the apices of which, hard yellowish-coloured scabs were attached. The disease had existed for nearly two years, and eight months had elapsed between the first appearance of the

tubercle in the lip and the occurrence of ulceration, during which time several of the lymphatic glands on both sides of the neck became enlarged and slightly painful. By the arsenical lotion, which was at first applied as an escharotic, and afterwards as a stimulant, and by small doses of a solution of the murias hydrargyri, so as to affect the gums, the morbid action of the parts was arrested, and in less than two months a complete cure was accomplished. Although a considerable portion of the lip was destroyed, yet, as healthy granulations formed, the parts were gradually approximated, by means of long strips of adhesive plaster, and a narrow double-headed roller, and ultimately re-union took place, and but little deformity was produced.

Sometimes the progress of a lupoid tubercle may be arrested, and its ulceration prevented, by the application of leeches around its base, especially when the tumour is painful and covered by inflamed integuments. This, followed by evaporating lotions, and alterative doses of calomel, will not unfrequently subdue the inflammation upon which the progress of the disease depends, and reduce it to that indolent and chronic state, in which friction, with an ointment containing the ioduret of zinc or mercury, may be beneficially employed to promote its absorption.

ON LUMBAR ABSCESS.

ALTHOUGH this is still a formidable disease, yet it has become more manageable, and proved less frequently fatal, since the method of treatment recommended by Abernethy was so generally adopted. By frequently puncturing the tumour, and healing the wounds, the sac is allowed to contract, and the inflammation of its inner surface, upon which the chief danger of the treatment depends, is in a great measure prevented. Before the matter is evacuated by puncturing the cyst, I have derived much advantage from establishing an issue over the lumbar spine. This was had recourse to in every case, whether connected with disease of the vertebræ or not, and it seldom failed in preventing the occurrence of those destructive attacks of inflammation of the cyst, which so frequently frustrate the surgical treatment of the disease. I have also counter-irritated the depending part of a lumbar abscess by the application of moxa, when, from non-adhesion of the puncture, there was reason to fear that inflammation of the cyst would supervene; and in several cases with decided advantage.

CASE CXLIV.—*Lumbar Abscess successfully treated by an issue over the Spine, and by repeatedly puncturing the tumour, and burning Moxa over it.*—W. J., æt. eighteen, admitted 14th July, 1826. Below Poupart's ligament, on the left side, there was a diffuse swelling of the thigh, with a prominent portion, about the size of an orange, betwixt the gracilis and sartorius muscles. The integuments covering this were thin and discoloured; fluctuation was distinctly felt; and by coughing, an impulse was communicated to the tumour. He complained of pain in the left iliac and lumbar regions, but no tenderness, swelling, or irregularity of the spinal column could be detected. The tumour was first observed at the upper part of the thigh five weeks ago, but for several months previously he had been subject to pain in the back, and weakness of the limbs. His strength was much diminished, his countenance and com-

plexion indicated the scrofulous diathesis, he was troubled with frequent dry cough, hurried breathing, and night-sweats; he could not stand erect, or walk without keeping the trunk bent forward at a considerable angle; his pulse was one hundred and twenty, the skin hot, the tongue white, and the bowels loose.

A small caustic issue was formed on the left side of the spinous process of the second lumbar vertebra; and after the eschar had separated, and the discharge was established by the insertion of peas, the abscess was punctured, and about eight ounces of well-matured pus (being apparently about two-thirds of its contents) were evacuated. The edges of the wound were brought accurately together, and adhesion effected. He was allowed a milk diet, with a small quantity of wine, and six grains of quina daily; his strength and appetite gradually returned, his pulse fell to eighty in the minute, and the diarrhœa and perspirations ceased. The sac was punctured again in ten days, and the wound closed; but, on repeating this operation for the third time, about a fortnight after, adhesion did not take place; there was, therefore, a daily discharge of pus from the opening for about three weeks, when it completely closed. On the third day after the last puncture was made, he had a rigor, which was followed by pain in the lower part of the abscess, and by a fetid and brownish-coloured discharge. The application of a moxa over the most depending part of the cyst, and of another over Poupart's ligament, checked these symptoms, and restored the purulent secretion to a more natural appearance.

In some cases, we are able to ascertain that an affection of the spine is superadded to the lumbar abscess; but, on the other hand, the vertebræ may be in a state of caries, while there exists neither tenderness on pressure, swelling, or irregularity, to point out the presence of this unfavourable combination.

Case CXLV.—*Lumbar Abscess, connected with an affection of the Spine, which was not discovered till after death.*—A. S., æt. twenty-two, admitted 13th December, 1826. Below Poupart's ligament, on the right side, and extending over the

upper third of the thigh, was a large globular tumour, the size of a child's head, slightly pointed on its summit, where the integuments were thin and inflamed, and a strong impulse was felt on coughing. It fluctuated distinctly, and when the patient was in a recumbent position, the fluid which it contained could be pressed up so as to form another tumour within the abdomen. It was free from pain, except when much handled, and no disease of the spine could be detected. The appetite was impaired, the countenance pale, and the pulse ninety, and feeble. The tumour was first observed seven weeks previously, but he had not enjoyed good health for nearly three years, at which time his left leg was amputated for scrofulous disease of the knee-joint.

After burning three moxas over the lumbar spine, a puncture was made into the most depending part of the tumour, and a pound and a half of pus, with flakes of curdy matter, evacuated. The wound was closed before the sac was more than two-thirds emptied. In two days he had a rigor, which was followed by febrile excitement, and pain in the tumour, which was increased on pressure and coughing. On the 19th, when the bandage was removed, fully a pound of pus escaped from the opening, with a greater quantity of flaky substance than formerly. Before it was more than half emptied, the wound was again closed, and a compress and bandage applied. On the 21st, three pounds of pus were discharged; he complained of acute pain in the left side of the thorax, which impeded respiration, but was removed by local bleeding and fomentations; his pulse was rapid and feeble, his strength was diminishing rapidly, he had frequent vomitings and diarrhœa, and his tongue was covered with aphthæ. After this period the discharge became brownish-coloured, fetid, and mixed with air; and he died in a state of great exhaustion, on the 7th of January.

On inspection, the cavity of the abscess was found to extend from the right side of the spine, close to the diaphragm, along the surface of the psoas muscle, and under Poupart's ligament, to the middle of the thigh. The fascia lata was completely separated from the parts beneath, and the femoral vessels lay in the bottom of the abscess, their sheath being merely covered

with a thin layer of scrofulous matter; the sac was thickened, and of a deep-brown or chocolate colour; in some places its surface was granular, and in others, where it was covered by floating portions of lymph, it had a fleecy appearance. The psoas muscle was wasted, softened, and dark-coloured. There was a small opening through the posterior wall of the sac, opposite the upper edge of the sacrum, which extended to the two inferior lumbar vertebræ. These, when removed, were found to be extensively carious, as was also the upper articulating surface of the sacrum. A considerable portion of the inter-vertebral cartilage was destroyed, but no curvature or displacement had taken place.

This case illustrates the changes, both local and constitutional, which are not unfrequently produced by puncturing a large lumbar abscess: the sac becomes inflamed; the matter secreted by it is changed both in quantity and quality; the system sympathizes with the local disease; and high irritative fever is produced. These symptoms may occur almost immediately after the tumour has been opened; but, in general, a few days will elapse before the rigor takes place, by which they are usually ushered in. When the abscess is large, and the integuments thin and discoloured, the local inflammation produced by the puncture is usually more speedy in its appearance, and more destructive in its progress; the constitutional symptoms are therefore more violent, the chance of procuring adhesion of the wound is lessened, and the danger is altogether more imminent than when the matter has been evacuated at an earlier period. It may happen, however, as in the following case, that the constitutional disturbance consequent on puncturing the abscess may lead to a fatal termination, although no inflammation of the sac be present.

Case CXLVI.—*Lumbar Abscess from disease of the Spine, which, after being punctured, terminated fatally by the occurrence of irritative Fever and effusion on the Brain.*—W. D., æt. twelve, was admitted on the 28th December, 1826, on account of a lumbar abscess which projected from the inner and upper part of the left thigh, where it was nearly as large as a child's head. The characters of the disease were distinctly marked;

the integuments covering the most prominent part were thin and inflamed; and several of the inguinal glands were enlarged, as were those under both angles of the jaw. There was fixed pain in the lumbar spine, increased on pressure and motion, especially at the lower part, where two of the spinous processes were projecting, and around which the integuments were thickened and painful. He had suffered under pain and weakness of the back for some years, but the tumour was only observed five weeks before his admission into the Infirmary.

By the application of caustic, an issue was established on both sides of the lumbar spine; and on the 2d of January, as the integuments covering the abscess threatened to give way, a puncture was made, and ten ounces of pus discharged. On the 4th, it was found, on removing the dressings, that the wound was not adhering; twelve ounces of matter were therefore removed. In the evening he had a slight rigor, followed by smart febrile excitement, and acute pain in the lumbar spine. For several days the pulse ranged from one hundred and twenty to one hundred and forty; the skin was hot and dry; he had vomiting and hiccup; his face was flushed, his eyes suffused, his breathing hurried, and the tongue and teeth were covered with a typhoid fur. There was no pain in the abscess, the discharge from which was diminished, and had more the appearance of whey than pus. The pain in the spine, however, became so excruciating, that he could not tolerate the slightest motion. He was occasionally delirious, and died in a state of coma on the 19th.

On inspection, the cyst was found to be considerably larger and more extensive in the abdomen than exterior to it, and to extend from above the origin of the psoas muscle to the middle of the thigh. It was free from inflammation, and covered by curdy matter, which adhered firmly to its inner surface. The lumbar vertebræ were curved to the left side, and the three inferior bones carious and surrounded by pus. The inter-vertebral cartilages were ulcerated, and an incipient psoas abscess, about the size of an orange, was discovered on the right side of the spine. That portion of the spinal marrow enclosed in the affected bones was softened, the brain was in a state of congestion, there was effusion under the arachnoid membrane, on the

surface of the hemispheres, and each lateral ventricle contained about half an ounce of limpid serum.

As the puncturing of the abscess did not produce inflammation of the sac, it is probable that the constitutional excitement which ensued did not depend so much on this cause as on the disease of the spine, to which all the most urgent symptoms were to be attributed. The irritation might thus be communicated from the spinal marrow to the brain, and the congestion and effusion produced; to which secondary occurrences, the death of the patient was more immediately to be referred. But for the thin and inflamed state of the integuments covering the abscess, the tumour would not have been punctured until after a more prolonged attempt had been made to check the progress of the spinal disease. In all similar cases the evacuation of the matter should be deferred until the original disease of the vertebræ has been moderated by leeches, issues, &c., and by strict confinement in a recumbent position. By an observance of these points, I have seen some cases of lumbar abscess complicated with spinal disease, which were successfully treated; and by their neglect, the operation of puncturing the tumour is often speedily followed by fatal consequences.

ON SOME OF THE DISEASES OF THE TESTIS.

Hydrocele is not unfrequently produced by both acute and chronic inflammation of the testicle. In the former case, the removal of the fluid by puncture is seldom required, it being speedily absorbed so soon as the morbid action which gave rise to it has been arrested; but when the affection is of a chronic kind, surgical interference is generally necessary. If, on the evacuation of the fluid, the testicle is found enlarged, and acutely painful when handled, this ought to be removed by suitable treatment, before an injection is had recourse to. By neglecting it, I have frequently seen acute local inflammation and high constitutional excitement produced. When the disease is connected with a thickened state of the tunica vaginalis, it is difficult to excite by injections such a degree of inflammation of the sac as shall insure its obliteration. If this cannot be accomplished, I have, in several cases, obtained a radical cure by the excision of a small portion of the tunica vaginalis. This operation being, however, generally followed by severe inflammation, ought not to be had recourse to until the usual method by injection has failed.

Case CXLVII.—*Hydrocele cured by Excision of a portion of the tunica Vaginalis, after having resisted a variety of stimulating Injections.*—A. C., fifty-eight years of age, had been subject to a hydrocele on the left side for three years, during which time it was repeatedly punctured and injected. When admitted into the Infirmary, the fluid, which amounted to ten ounces, was drawn off by a trocar, and undiluted port wine injected. It occasioned slight smarting, but in a few minutes this disappeared, and in eight days the fluid had re-accumulated to its former extent. It was again punctured, and a strong solution of the sulphate of zinc injected: this having produced no uneasiness to the patient, was allowed to escape, when the sac was immediately filled by injecting pure brandy into it. As this failed in exciting the necessary inflammation,

the tumour was again punctured at the distance of three weeks, and after the fluid was discharged, the opening was enlarged, and a portion of the thickened vaginal coat removed. This was followed by smart inflammation, and ultimately by a complete obliteration of the sac.

When the serum is effused in an unusual quantity after the operation, which it sometimes is, I have generally succeeded in hastening the radical cure by puncturing the scrotum, and emptying the sac on the third or fourth day after the injection has been employed. In the following case, this procedure gave rise to suppuration, by which the cure, although somewhat protracted, was nevertheless secured.

Case CXLVIII.—*Hydrocele cured by suppuration.*—J. B. was admitted on the 6th July, 1831, on account of a hydrocele of the right side, of four months' duration. It had been frequently tapped, but not injected. On the 8th, nine ounces of a straw-coloured fluid were evacuated, and wine and water thrown in. In a few hours the integuments around the puncture became inflamed, and this extended along the right groin to the anterior spine of the ilium; the tunica vaginalis was speedily refilled. On the 20th, as the scrotal integuments were considerably less inflamed, and the tunica vaginalis was greatly distended, it was again punctured, and ten ounces of clear serum withdrawn. A third puncture was made on the 23d, and sixteen ounces evacuated, the last of which was purulent. To encourage the suppuration, a small tent was introduced: the purulent discharge became profuse, and the sac filled, and was secured to the testicle by granulation.

This operation is occasionally productive of serious, and even of fatal consequences. I am aware of several cases, besides those on record, in which it was followed by tetanus, by fatal erysipelas, by sloughing of the scrotum, by effusion into the brain and thorax, and by enteritis. I have also seen it produce troublesome hemorrhage, the blood either filling the sac, becoming effused into the loose cellular tissue of the scrotum, or escaping through the wound.

When an irreducible omental hernia is complicated with hydrocele, the usual expedients for the cure of the latter disease

cannot always be safely employed. The similarity of structure, and contiguity of the affected parts is such, that when inflammation is excited by injection or otherwise, for the purpose of producing a cohesion of the tunica vaginalis, it is liable to be propagated to the omentum or its sac, and give rise to alarming symptoms. It is also necessary to consider, before any operation is proposed, that as a preternatural collection of fluid sometimes takes place in the hernial sac itself, which may present all the characters of hydrocele, great caution is requisite in the diagnosis.*

In the following case there existed a double hydrocele on the same side, the lower tumour being formed in the tunica vaginalis, and the upper one in the cord. The former was cured by a stimulating injection, and the latter by the excision of a portion of the cyst.

Case CXLIX.—*Hydrocele of the Tunica Vaginalis, and of the Cord, on the same side.*—W. G., aged forty-eight, applied at the Infirmary, on account of a hydrocele on the left side, of eleven months' duration. Two tense, elastic, and transparent tumours were easily discovered on the same side, being close to, but apparently distinct from, each other. The upper one was globular, and about the size of a pigeon's egg, while the inferior one was pyriform, and as large as two fists. It was punctured and injected, when the upper one was ascertained to be connected with the spermatic cord. It was therefore exposed by an incision, punctured, and a portion of the cyst removed. The return of the disease was thus prevented by the obliteration of both cavities.

Hæmatocele.—Out of several cases of this disease which have come under my notice, I shall select the following, as it points out an unusual cause of the complaint, and the successful result of the operation required for its removal:—

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* See Remarks on Omental Hernia, in the 16th volume of the Medico-Chirurgical Transactions of London.

Case CL.—*Hæmatocele produced by a small vascular tumour growing from the inner surface of the Tunica Vaginalis—Cured by ligature and excision.*—G. G., æt. forty-four, applied on the 12th December, 1826, on account of a large, livid swelling of the left side of the scrotum, from the effusion of blood into the tunica vaginalis. The disease had existed for a fortnight, but could not be traced to external injury, or any other obvious cause. The tumour was pyriform, but not transparent; it fluctuated distinctly in the upper and anterior part, while posteriorly it had a firm resisting feel.

On the 14th, I punctured the swelling with a large trocar, and discharged about twelve ounces of a dark bloody fluid. A small soft tumour, about the size of a walnut, was then discovered in the front of the scrotum; it was apparently attached to the tunica vaginalis, but had no connexion with the testis. The gentle examination that was made to ascertain the state of this tumour, gave rise to a renewal of the hemorrhage, so that in less than an hour the tunica vaginalis was again filled with blood.

As this tumour appeared to be the source of the bleeding, it became necessary to remove it. Instead of cutting out that part of the integuments of the scrotum to which the morbid growth was attached, I made an incision, two and a half inches in length, into the cavity of the tunica vaginalis, close by the side of the tumour. When the blood was evacuated, the tumour was turned out, and found to be exceedingly soft and vascular. It bled profusely on the slightest touch, and was fixed by a narrow neck to the tunica vaginalis. I tied the pedicle, and cut off the tumour immediately before the ligature, which was allowed to hang out at the wound. Smart inflammation followed, suppuration took place, and in less than a month a cure was accomplished.

Simple Fungus of the Testis.—This disease is preceded by inflammation of the testicle, which ends in the formation of an abscess. The integuments ulcerate, and, after a certain length of time, an indolent, irregular tumour, of a granular appearance, is formed, which springs from, and is inseparably connected with, the glandular substance of the testicle. It

occurs in robust and healthy individuals from external violence, but it is most frequently met with in those whose constitutions are impaired by intemperance and sexual indulgence, or who labour under syphilis or scrofula.

Case CLI.—*Granular Fungus of the right Testis—Cured by excision.*—R. L., aged twenty-six, admitted 23d May, 1826. There was situated on the right side of the scrotum, at its inferior part, an irregular, indolent fungus, fully the size of a hen's egg, which had commenced three months previously, without any obvious cause. It was attached by a broad base to the body of the testicle, which was slightly enlarged; it had a granular appearance, the hollows or slight indentations on its surface being lined with a tenacious greyish-coloured secretion. The surrounding integuments were indurated, inflamed, and the seat of occasional burning pain. His health was much impaired, and he complained of debility and want of sleep. Two years before, he had had a sore on the glans-penis, and a bubo in the groin, which were cured by mercury; and his neck was covered with the cicatrices of old scrofulous ulcerations. He was ordered a Plummer's pill every night, with a pound of the Decoction of Sarsaparilla daily; and lunar caustic was freely applied to the surface, and around the base of the tumour. His gums became slightly affected, but the caustic seemed to produce little or no change on the size or appearance of the fungus. On the 10th of June, the tumour was removed by the knife, with a small portion of the surrounding integuments. It was found to proceed from the glandular substance of the testis, which it resembled in appearance and structure. Adhesion of the wound did not take place, but healthy granulations formed, and the parts cicatrized in about four weeks. The cure was considerably retarded by the occurrence of inflammation of the left parotid gland, about eight days after the operation, and by the formation of a large abscess under the right angle of the jaw.

Case CLII.—*Granular Fungus of the left Testicle—Excision unsuccessful.*—J. M'E., aged thirty-six, sailor, was admitted on the 7th July, 1826, with a large fungus of the left testis.

About twenty-two months before this period, he received a blow on the part when lifting a heavy cask, which produced acute inflammation of the gland. When this subsided, a small hard tumour was discovered in the fore part of the scrotum; the integuments covering it inflamed and ulcerated, and a firm indolent fungus projected, which ten months after was greatly diminished by the internal use of mercury, and the introduction of setons. On his admission, the tumour was about the size of a small lime, and there was a trifling gluey discharge from its surface, which was covered with pale, smooth, and indolent granulations. It was connected by a broad attachment to the testis, which was slightly enlarged, as was also the cord; and the integuments of the scrotum were hard, irregular, and livid.

On the 14th, the fungus was extirpated, and the ulcerated edges of the scrotal integuments surrounding it pared off. It was found, as its previous appearance and connexions indicated, to proceed from the glandular substance of the testis, which was adhering to the anterior wall of the scrotum. The tunica albuginea was laid bare, and the tumour cut off on a line with this membrane. The exposed part of the testicle was yellowish-coloured and pulpy. The inflamed and indurated condition of the integuments prevented the closure of the wound by adhesion; so that, on the removal of the dressings, the parts had widely separated, and the testicle was exposed. He complained of acute pain in the scrotum, abdomen, and left thigh; he had severe attacks of bilious vomiting, and there was a threatening of erysipelas. As these symptoms abated, there immediately sprung up from the diseased surface of the testis, another fungus, which soon attained the size and appearance of the former one. By an alterative mercurial course with sarsaparilla, and by the external use of escharotics and pressure, the tumour gradually decreased, the integuments closed, and he left the Infirmary perfectly cured.

When the testicle is enlarged or otherwise affected, the removal of the fungus by the knife or the ligature, does not always succeed in curing the disease,—its recurrence, in such cases, being only prevented by constitutional treatment. Al-

though it may arise from a local cause, yet, in general, it can be traced to some affection of the system, which ought to be counteracted by suitable remedies, before the morbid growth is extirpated.

CASE CLIII.—*Granular Fungus of the right Testis—Cured by excision, after the diseased state of the Gland was removed by constitutional means.*—T. S., aged thirty, player, was admitted on the 16th November, 1826. The fungus, which was about the size of a pigeon's egg, was protruded from the right testicle, through an ulcerated opening in the centre of the scrotum. It was indolent, and free of pain; and its surface was granular, and covered with a thin layer of a greyish-coloured and adhesive secretion. The surrounding integuments were thickened, indurated, and livid; and his health was much impaired by intemperance. Both testicles became enlarged about four months before his admission; the left remained stationary, but a small abscess formed in the right, from which the diseased growth originated.

After affecting the system with mercury, and reducing both testicles to their natural size, the fungus was removed by the knife on the 7th of December. The edges of the skin were approximated, so as to cover the testis, and firm pressure was applied. On the 22d, the wound was closed, and he was dismissed, cured.

The rapidity with which the fungus forms, and the size it may attain after the integuments have ulcerated, and the abscess burst, will be found not unfrequently to depend on the condition of the testis. When the gland is much enlarged by chronic inflammation, its cellular texture is loaded with fibrine; and it is so firmly compressed by the unyielding tunica albuginea which invests it, that, when this part ulcerates, a considerable protrusion of the substance of the testicle takes place, rapidly, in the form of an indolent fungus. The original tumour is, therefore, chiefly composed of the glandular structure of the testis; and there being no perceptible line of separation between the new growth and the old gland, we cannot often ascertain where the one terminates and the other begins. It

forms what may be called a hernia of the gland, similar to what occurs in the brain when a portion of the skull has been removed; and, in proportion as it increases in size, the testicle from which it proceeds diminishes, until nearly the whole of its substance has escaped. But when the abscess which precedes this disease is accompanied with only a slight enlargement of the testis, the fungus is slower in growth, smaller in size, and softer in texture; and it is not so much to a protrusion of the pulpy substance of the gland, as to the formation of new granulations by the vessels exposed by the suppuration, that this form of the disease is to be attributed. In the former case, the diseased state of the gland must be removed by an alterative mercurial course, before the fungus is extirpated; in the latter, firm pressure, or the application of escharotics, will seldom fail in destroying the morbid growth, without the aid of constitutional treatment.

Carcinoma of the Testis.—A true schirrous affection of this gland is extremely rare in its occurrence. I have only met with one case in which this disease was distinctly and unequivocally marked. Castration was performed, and the result was successful.

Case CLIV.—*Carcinoma of the left Testis—Cured by extirpation.*—W. G., an Irish labourer, forty-six years of age, had been affected with enlargement and induration of the left testicle, for fourteen months previous to the 18th August, 1825, when he came under my care, as one of the city paupers. The disease at its commencement was accompanied with effusion of fluid into the tunica vaginalis, which was twice drawn off with a trocar. The gland gradually enlarged, and was from the first of a stony hardness. It was about four times the natural size, its surface was irregular, the epididymis was thickened, and the pain was frequent and lancinating, but the spermatic cord did not appear to be affected. His countenance was sallow, his digestion deranged, his pulse slightly accelerated, and he complained of pain and weight in the loins. He was confined to bed for a month, and during the greater

part of this time camphorated mercurial ointment was rubbed on the affected testis, twice daily; his mouth became affected, but the disease continued to increase.

On the 24th of September, the operation of castration was performed, when the testis was found exceedingly hard and tuberculated. A section of it presented a yellowish-white colour; its centre was somewhat softened; and, in one or two places, it was intersected by white fibrous bands. Nearly the whole of the wound healed by the first intention, and in less than a fortnight it had completely cicatrized. Two years after, when I saw this patient again, he was in good health, and had not been threatened with any return of the disease.

Medullary Sarcoma of the Testis.—This constitutes the most frequent form of malignant disease to which the testicle is subject. The rapidity with which it sometimes advances to a fatal termination, by extending to the abdomen, is strikingly displayed by the following case:—

Case CLV.—*Medullary Sarcoma of the left Testis—Fatal from disease in the Abdomen.*—W. R., aged twenty, admitted 30th May, 1826. Seven months previously he received a blow on the left testicle, which part soon became swollen, hard, and slightly painful; and for this affection he had been under treatment in the Edinburgh Infirmary for several weeks, but without being benefited by it. The swelling was nearly globular, and about the size of a small orange; it was smooth on the surface, had a solid feel, and was not painful, except when much handled. The cord was unaffected, but he had a sallow, unhealthy appearance. He complained of pain in the epigastric and left hypochondriac regions; and close to the umbilicus, on the same side, and extending back towards the spine, a hard, ill-defined swelling was discovered, where he complained of tenderness on pressure.

A variety of local and constitutional remedies were employed, it being judged imprudent, from the suspicious state of the abdomen, to have recourse to castration. For the first three weeks, but little change took place; the testicle did not increase in size, or become more painful, but it became softer

and more elastic. On the 26th of June, after a severe rigor, the tumour in the left side of the abdomen began to increase more rapidly, and he was unable to lie on the affected side, or tolerate pressure over it; his pulse was small and quick, and he had incessant thirst and troublesome vomiting. The pain gradually extended over the abdomen, and was increased by pressure; and the only ease he obtained, was when he lay on the right side, and relaxed the abdominal muscles, by retaining the trunk and thighs in a bent position. Notwithstanding the use of local and general bleeding, blistering, calomel and opium, &c., the peritonitis did not diminish. He died on the 5th of July.

On inspection, the abdominal cavity contained a pound of sero-purulent fluid. The peritoneal coat of the stomach and intestines was extensively inflamed, and covered with patches of lymph. The liver was enlarged, softened, and had a motleyed appearance. There was a tumour, nearly as large as a child's head, situated under the transverse arch of the colon, and covered by the small intestines. It lay close upon the spine, and was firmly attached to the aorta, vena cava, and left kidney. A section of the mass showed it to be composed of a soft brownish-coloured substance, which resembled brain mixed with blood, and from the more solid parts a fluid like pus was squeezed out. The inferior part of the testicle presented the same appearance and structure as the abdominal tumour, but the upper half was firm, greyish-coloured, and slightly fibrous. The epididymis was enlarged, the tunica albuginea thickened, and adhering to the tunica vaginalis. The spermatic cord was sound.

The peculiarities of this case were, the apparent suspension of the malignant disease of the testicle, so soon as the tumour in the abdomen began to show itself; the absence of any morbid affection of the cord; and the occurrence of peritonitis, to which the death of the patient was more immediately to be referred. It seldom happens, even when the disease has extended to the abdomen, that the testicle remains stationary; on the contrary, it soon loses the globular shape and hardness which characterize its first stage, and becomes more and more enlarged, pyriform, and elastic; the

scrotum is traversed by varicose veins; the surface of the gland becomes irregular, and adheres to the integuments, which frequently ulcerate and give exit to bloody serum and fungus. While these symptoms are in progress, and often before the testis is extensively affected, the cord becomes implicated, by which means the disease is propagated to the abdomen. This latter occurrence may, however, take place while the cord remains sound,—a fact which it is of importance to recollect before castration is had recourse to,—it being necessary, in such cases, not only to ascertain the freedom of the spermatic cord from the disease, but also to satisfy ourselves, by accurate examination, that there exists no internal affection which can militate against the success of an operation.

When the disease has extended to the abdomen, it may prove fatal by exciting peritonitis; but, more frequently, the attachments which the tumour forms to the different viscera, will so impede their functions, as to give rise to urgent symptoms, aggravate the general excitement, and accelerate the progress of the disease.

Case CLVI.—*Medullary Sarcoma of the left Testis—Castration successful.*—J. H., æt. thirty-two, admitted March 2d, 1832. The left testicle was swollen, tense, pyriform, and hard, except at the anterior and upper part, where it had a soft elastic feel. It was nearly as large as the fist, and had a smooth surface; and the integuments covering it were of a dusky-red colour, but not adhering to it. The cord was not affected, but he complained of occasional pains in the abdomen and back, which were aggravated during the night, and sometimes deprived him of sleep. The tumour, when first observed after a severe strain, twelve months previous to his admission, was about the size of a pea, and attached to the lower part of the testis, which gradually increased, until the whole gland was involved. He was much emaciated, and had a sallow countenance; his pulse was ninety-six, and weak.

On the 3d of March, I made an exploratory puncture into the anterior and upper part of the tumour, where there was an obscure fluctuation. Only a few drops of blood escaped; and in two days the wound was healed. He was ordered a

pound of the decoction of sarsaparilla, with small doses of a solution of the murias hydrargyri daily; and an ointment, containing iodine and mercury, was rubbed on the tumour night and morning. This treatment was continued for three weeks, during which time the gums were slightly affected, but no improvement took place. On the 28th, it had to be given up, having produced diarrhœa, severe abdominal pains, and excoriation of the integuments of the scrotum. After this, his health began to decline still farther; his pulse became quick and irritable, and his appetite much impaired. The testicle continued to enlarge; the upper part of it being within an inch of the inguinal ring; the cord was slightly painful, and contained a small tumour about the size of a pea, but no disease could be detected in the abdomen. On the 17th of April, I removed the diseased testis, along with an elliptical portion of the integuments, and that part of the cord which contained the small tumour. The dissection of the gland was begun below, and carried upwards. The cord was separated from its connexions, and compressed between the fingers and thumb of an assistant; but it unfortunately slipped, and became retracted to within the edge of the ring. Some difficulty was experienced in securing the spermatic artery, which was only accomplished after the incision was prolonged upwards, and a small part of the inguinal canal slit open; three sutures were introduced; the wound was covered with dry lint, over which a T bandage was applied. In two hours arterial hemorrhage occurred, but not more than two or three ounces of blood were lost. On removing the dressings and stitches, the ligature was found to have separated from the spermatic artery. Before it could be laid hold of, and again tied, the inguinal canal had to be slit open to the internal ring.

For three days he complained of acute pain in the left side of the abdomen, which was swollen and somewhat tense; the pulse was quick and sharp, and the bowels constipated. These symptoms were removed by leeches, fomentations, and purgatives, followed by a few doses of calomel and opium. The wound adhered, except that part in the groin which became irritable and sloughy. This was checked by the application of lunar caustic; his strength improved under the use of wine,

quina, and nourishing diet; and he was dismissed, cured, on the 20th of May.

The testis, when examined, had the usual appearance and structure of medullary sarcoma, or fungus hæmatodes. It measured three inches in the transverse, and five inches in the longitudinal diameter, and weighed nearly fourteen ounces. A section of it exhibited a yellowish-white appearance, with here and there bloody patches from enlarged veins, and cysts containing a sero-sanguineous fluid. The inferior half was harder than the superior, where a cyst, about the size of a walnut, was situated. The soft, brainy-like matter was deposited between the septa of the testis; and when squeezed out, it resembled pus tinged with blood. The denser portions of the gland seemed to contain a portion of coagulable lymph, both separate from, and mixed up with, the encephaloid structure peculiar to this disease. The posterior part of the testis was covered with a cluster of varicose veins; the epididymis was enlarged, and sunk into the substance of the swelling; the tunica albuginea was greatly thickened, and adhering to the tunica vaginalis. The cord had a healthy appearance, except where the small tumour was situated, which was composed of a soft, bloody mass, like coagulated blood.

The appearance of this patient, on admission, and the state of his disease, led me to believe that he was labouring under a strumous affection of the testis. The diagnosis is often obscure, and sometimes it cannot be satisfactorily established. I began to doubt the accuracy of my opinion, when I observed the local and constitutional changes which took place during the progress of the treatment. It was evident, however, that the function of the gland was destroyed by the extensive morbid alteration which its structure had undergone; and whether this was of a simple or malignant character, its extirpation, in both cases, became equally necessary.

It is but rarely that castration is successful in removing this malignant affection; and that only when the disease is in an incipient state, and before it has involved the spermatic cord, or extended to the abdomen. Should the disease of the testis owe its origin to constitutional causes, the timeous removal of the gland, by operation, may still prove unsuccessful, al-

though the abdomen be sound, and the cord unaffected; because there often exists a disposition to the formation of such tumours in other and distant parts of the body. In a case which I had an opportunity of seeing several years ago, the removal of the testis was followed, in less than two months, by the formation of a large tumour in the posterior mediastinum, and by a number of smaller ones on the surface of the lungs, all of which exhibited the structural peculiarities of this formidable and destructive disease.

THE END.

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