

Cases of the excision of carious joints / by H. Park and P.F. Moreau ; with observations by James Jeffray.

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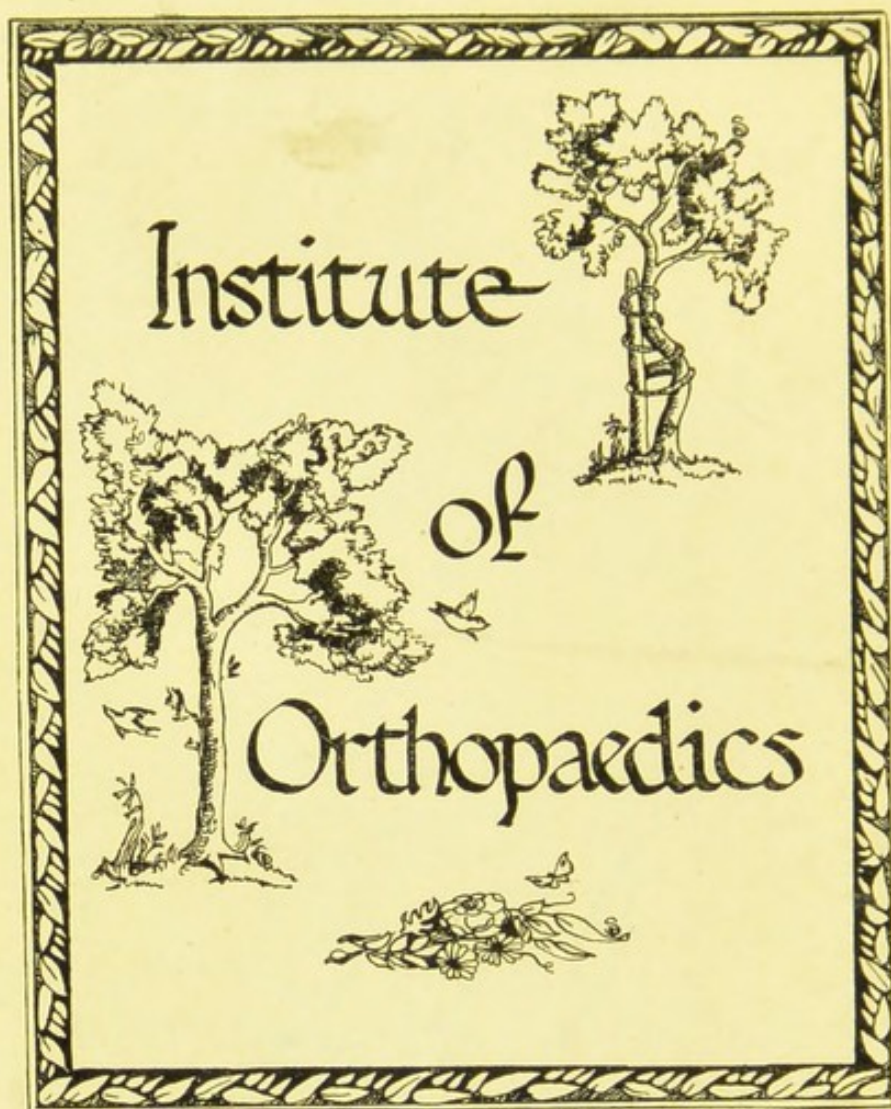
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Glasgow
Medical Society
INSTITUTED

A.D. 1809.

Cum Sociis Studeo.

No 236.

236

C A S E S
OF THE
EXCISION
OF
CARIOUS JOINTS.

BY
H. PARK,
Surgeon in the Liverpool Hospital;
AND
P. F. MOREAU,
De Bar-sur-Ornain, M. D. de l'Ecole de Paris.

WITH
OBSERVATIONS BY JAMES JEFFRAY, M.D.
Professor of Anatomy and Surgery in the College of Glasgow.

Illustrated by Engravings.

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1806.

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TO HIS GRACE

JAMES DUKE OF MONTROSE,

LORD CHANCELLOR OF THE UNIVERSITY OF
GLASGOW,

&c. &c.

THE FOLLOWING COMPILATION,

relating to

AN IMPORTANT SURGICAL OPERATION,

Is humbly dedicated

By His Grace's much obliged

And most obedient Servant,

JAMES JEFFRAY.

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Explanation of the Plates

LETTER

TO

MR PERCIVAL POTT.

BY

H. PARK,

Surgeon in the Liverpool Hospital.

LETTER

MR PERCIVAL POTT.

BY

H. PARK,

Surgeon in the Liverpool Hospital.

LETTER

FROM

MR PARK OF LIVERPOOL.

SIR,

SOME months ago I mentioned to you, that my attention had been lately somewhat engaged in attempting what I apprehended to be a new mode of treating some of the affections of the larger articulations.

From the regard which you always shewed me whilst I was under your roof, and from that steady friendship with which you have honoured me since, I am encouraged to hope you will not think I am committing too great a trespass

on your patience, in giving you a more detailed account of that business, with a view, provided I have your approbation, of submitting it to public inspection. I hope that the importance of the subject will in some measure apologize for me, as it must be allowed, that, of the various injuries and diseases by which mankind are deprived of limbs, those affecting the larger articulations form no inconsiderable share.

Scrophulous affections of the joints, commonly distinguished by the name of White Swellings;—collections of pus in the articular cavities, originating in simple inflammation;—gun-shot wounds and compound fractures of the joints;—nay, even the most simple, penetrating wounds, however favourable may be the termination in some few cases, are nevertheless, in spite of all the modes of obtaining relief hitherto discovered, but too frequently productive of such a train of evils, as terminate at length in the destruction of the unhappy sufferer, unless prevented by the timely removal of the limb. To enumerate these evils, would be only to take up your time and attention with

what is already too well known to every practitioner in surgery; and to attempt to adduce arguments or facts in support of the above assertion, would be only taking pains to prove what is already pretty generally acknowledged. To alleviate in some degree these evils, and to avert some of the dreadful consequences, is the design of these few sheets; in which I hope to shew, that in some of the affections of the knee and elbow, in which amputation has hitherto been deemed indispensibly necessary, Surgery has yet another resource, which, as far as my reading and experience enable me to judge, has not yet been attempted by any other practitioner; and by which the limbs of persons under the above circumstances may yet be preserved, with such a share of the motions which Nature had originally allotted to them, as to be considerably more useful than any invention which art has hitherto been able to substitute in their stead.

The resource I mean, is the *total extirpation of the Articulation*, or the entire removal of the extremities of all the bones which form the

joints, with the whole, or as much as possible, of the Capsular Ligament; thereby obtaining a cure by means of Callus, or by uniting the Femur and Tibia, when practised on the knee; and the Humerus, Radius, and Ulna, when at the elbow, into one bone, without any moveable articulation.

The practicability of such an operation, with a probability of success, occurred to me some years ago; but as the undertaking appeared liable to many difficulties and objections, I wished to avoid being too precipitate in the attempt, and therefore frequently made it the subject of conversation with different Gentlemen of the profession. The principal difficulties that occurred, either from my own reflections, or the observations of my friends, were as follows, viz. the hazard of wounding the principal blood-vessels;—the great inflammation, and large suppurations usually consequent on the wounds of the articulations;—the uncertainty of obtaining a firm Callus;—the loss of the insertions of the Extensor Muscles;—the doubt respecting the utility of the limb,

provided a cure could be obtained;—the uncertainty of removing the whole disease when Caries gave rise to the operation;—and, when undertaken on account of scrophulous affections of the joints, the hazard of a return of the same disease.—These difficulties, though they might appear at first sight very weighty, would, I was in hopes, on more attentive consideration, be found to lose much of their force. The danger of wounding the principal vessels in the arm was very trifling, their situation being sufficiently remote from the bone to place them out of all hazard. In the knee there was much more room for apprehension on this score, the Popliteal Vessels passing so immediately between the Condyles of the Femur; I was however of opinion, that they might be avoided without much difficulty; but this was easily determined by experiment on the dead subject: with this view, therefore, as well as to determine the mode of operating, the following trials were made in the Spring of 1781.

An incision was made, beginning about two inches above the upper end of the Patella, and

continued about as far below its lower extremity; another, crossing this at right angles, immediately above the Patella, the leg being in an extended state, was made through the tendons of the Extensor Muscles down to the bone, and nearly half round the limb; the lower angles formed by these incisions, were raised so as to lay bare the Capsular Ligament; the Patella was then taken out; the upper angles were raised, so as fairly to denude the head of the Femur, and to enable me to pass a small catlin across the posterior flat part of the bone immediately above the Condyles, taking care to keep one of the flat sides of the point of the instrument quite close to the bone all the way. The catlin being withdrawn, an elastic spatula was introduced in its place, to guard the soft parts, while the Femur was sawed through: which done, the head of the bone thus separated was carefully dissected out; the head of the Tibia was then with ease turned out and sawn off, and as much as possible of the capsular ligament dissected away, leaving only the posterior part covering the vessels, which, on

examining, I had the satisfaction to find had not only escaped unhurt, but that it was not a very narrow escape; they had still a pretty good covering, and had been through the whole operation far enough out of the course of the knife. It must be confessed, that the appearance of the wound was somewhat formidable, exhibiting a very large cavern, with very thin Parietes; and, in short, there seemed little wanting to complete the amputation; yet, as the limb below would not be deprived of any part of its nourishment; and every healthy incised surface, as well of bone as of soft parts, has a natural tendency to granulate, I could not see any room to doubt that Nature would find sufficient resources to repair this breach.—The next attempt was on the joint of the elbow;—a simple, longitudinal incision was made from about two inches above, to the same distance below the point of the Olecranon; the integuments raised, and an attempt made to divide the lateral ligaments, and dislocate the joint: but this being found difficult, the Olecranon was sawn off, by which means

the joint became so much exposed, as to be easily dislocated without any transverse incision; the lower extremity of the Os Humeri turned out and sawn off, and afterwards the heads of the Radius and Ulna. This appeared a very easy operation, not considering that this was a joint without a disease, and in an emaciated subject, consequently one in which there was a great laxity of integuments. In the diseased joint, I apprehend, the case will be found far different, and that it will be necessary to make the crucial incision, and to divide the Humerus above the Tuberosities, in the manner I have already described in the extirpation of the lower extremity of the Femur.

The next difficulty was the great inflammation, pain, and extensive suppurations, usually consequent on wounds of large articulations; these appear to be, in a great measure, owing to the exposure of the Capsular Ligament, a membrane which, on the application of the slightest stimulus, is readily brought into a state of inflammatory tension, and is then most exquisitely sensible, and of a large cartilaginous

surface, extremely unfavourable for the production of granulation. But it must be considered, that by the operation in question, this ligament and cartilage would be removed, and a fresh incised surface obtained: besides, it is now well known that, on some occasions, large articulations may be treated with considerable freedom, without producing such dreadful consequences; of this the removal of the head of the Os Humeri, as practised by Messrs WHITE, BENT, and ORRED, and the sawing off the protruded extremities of bones in compound dislocations, as recommended by GOOCH and others, though operations differing considerably from the one I am treating of, are sufficient proofs. Why the symptoms consequent on these operations have been so mild, I will not take upon me to determine, yet think it not improbable it may be owing not only to the free openings made for the discharge of matter, but, in a great measure, to the state of relaxation in which the remaining portion of the capsular ligament was placed, by the removal of part of the bone forming the articulation. Now, that

I have had occasion to mention compound dislocations, it may not be thought out of place to relate a case of this kind, which fell under the care of Mr WAINMAN, of Shripton, in Craven, twenty-three years ago, who has the greater merit, as that mode of treating compound dislocations was, at that time, but little practised. This case, which, in justice to Mr WAINMAN, as well as to mankind in general, ought to have been published long since, he describes as “ a recent luxation of the Cubitus
 “ occasioned by a fall from a horse in full
 “ speed, which forced the Os Humeri through
 “ the common integuments a considerable
 “ length into the ground, and the bone was
 “ quite denudated ;” and adds, “ there was not
 “ a possibility of reducing it, and I thought it
 “ most eligible to take off the limb, which the
 “ family objected to. I called in Dr TAY-
 “ LOR, who was of my opinion, but it would
 “ not be complied with. We then judged it
 “ best to saw off the Os Humeri, which I did
 “ about an inch above the Sinus that receives
 “ the Olecranon ; I then placed the arm in

“ such a position as I thought would be most
 “ advantageous, prognosticating an Anchylosis
 “ would ensue, in which I was much mistaken;
 “ the person is now living, and can perform
 “ all the motions of the joint, which is as flex-
 “ ible as if nothing had ever been amiss.”—Mr
 WAINMAN, in another letter to my good friend
 Dr BINNS of this town, to whom I am indebted
 for the communication of the above, as I
 am to Mr WAINMAN for his permission to in-
 sert it here, describes the Luxation more par-
 ticularly, mentioning that the Os Humeri was
 dislocated inwards, and that the heads of the
 Radius and Ulna were forced under the Bi-
 ceps Muscle.

The next objection was the doubt of obtain-
 ing a firm Callus: for this doubt I was in
 hopes there could be no reasonable foundation,
 as we daily see that when two living surfaces
 of bare bone are opposed to each other, they
 have ever a tendency to unite; and as we see
 Nature so often effect this in these very arti-
 culations, under all the disadvantages of a dis-
 eased state of parts, surely there could be lit-

the reason to doubt that she would do, at least, as much when all disease was removed, and two perfectly healthy surfaces of bone were attempted to be united.

With respect to the loss of the insertions of the Extensor Muscles, it was sufficient to reply, that the joint being extirpated, there was no longer any want of muscles to move it; and that the incised ends of these muscles, as there would not be any part of them taken away, must unavoidably attach themselves to some part of the Callus; which was all that would be necessary.

The question concerning the utility of the limb, provided a cure could be obtained, was, indeed, a very important one, and deserved well to be considered. In the arm, however, the advantages arising from the preservation of a hand and fingers, with all their original motions, except those of pronation and supination, were so very evident, and so very considerable, independent of the motions of the elbow, or of any considerations respecting the length of the arm, as not to leave room for

a moment's hesitation, and were certainly sufficient to induce persons, in every station in life, to run many risques to obtain a cure on the terms I was proposing. In the leg, I own, I was less sanguine in my expectations of advantages equal to the hazard, and for the following reasons: The parts forming the Parietes of the Cavity, after the bone was removed, would be almost wholly tendinous or membranous; the opening would not be a depending one; the confinement to bed would be necessarily long; and the limb would probably lose much of its length: whereas in the elbow the bone is much smaller, in proportion to the whole of the limb, and is surrounded by a good deal of muscular flesh; the opening would be wholly depending, the confinement to bed but little, and the shortening of the limb a matter of no great importance. However, as these tendons and membranes would be placed in a state of considerable relaxation; as depending openings might be obtained if necessary; and as the confinement to bed would, probably, be no more than we often see pa-

tients support very well in cases of fracture, I did not see so much to fear even from these causes; and with respect to the loss of substance of bone, I expected to regain some part of that by callus; as it is well known to every attentive practitioner, that there is, in many fractures, a period of time, between the going off of inflammatory tension and the formation of callus, in which the limb may, if necessary, on account of much loss of bone, be kept in a state of extension, without material inconvenience; besides, on conversing with some persons who had stiff knees from different causes, with the limbs of their natural length, I found that they laboured under some inconvenience for want of some degree of shortening; as they found themselves obliged either to describe a circle at every step, to avoid striking their foot against every pebble that came in their way, or to seek an advantage by always keeping the stiff limb on the side of the lower ground: hence it appeared that some degree of shortening of the limb would be of advantage to the patient (a circumstance, in general, too

little attended to in the construction of artificial limbs); but what this degree would be, proportioned to what would take place in consequence of this operation, experience only could decide: could it, however, be kept within moderate bounds, I could then have no idea that a foot and toes performed so insignificant a share of the action of walking, independent of the flexion of the knee, as to leave a limb of this sort of no more value than a wooden one; and, indeed, the persons alluded to above with stiff knees, did certainly walk with a degree of firmness, security, and satisfaction, far superior to what the wearer of the best artificial leg I have yet seen can boast of; at the same time, I was ready to confess, that an artificial leg was an infinitely better substitute for a natural one, than any invention which art has yet furnished could be in place of a hand and fingers, and, therefore, should be more nice in the choice of cases in which I should recommend this operation in the knee than in the elbow, until farther experience should en-

able me to distinguish more accurately in what cases it would or would not be admissible.

With regard to the two last objections, they certainly operated with some, if not with an equal degree of force, against amputation; as in those few cases in which external marks were wanting to enable us to judge with tolerable accuracy of the extent of Caries, we were equally unable to know whether it might not extend beyond the part in which we should amputate; and in those habits, in which a feropulous acrimony was so prevalent as to occasion a return of the disease, it was altogether uncertain whether the next attack would be on this limb, on any other, or on any of the internal parts.

Upon the whole, I could not see any just cause to apprehend, that a person who had undergone an operation of this kind, would be in a less favourable state than one with a compound fracture with equal loss of bone, but in which the principal blood-vessels had escaped unhurt. Sufficient openings were made for the discharge of Pus, &c. and the ends of

the bones were made smooth by the removal of every ragged point and splinter; circumstances, under which I am happy to have it in my power to say, that a very considerable majority of those who are admitted into our Infirmary terminate happily. I am very sensible that this is by no means the case in the London Hospitals. How far the air of an Hospital, in the midst of so very large and populous a City, and the previous mode of living of the major part of those who are admitted there under these injuries may sufficiently account for this difference, I must leave others to determine; yet think myself authorized to say, that the bad success to which I have been an eye witness in the treatment of injuries of this kind, which appeared in their nature by no means formidable, though under the care of gentlemen of the first rank and abilities in the profession, has been such, as to justify the removal of many such fractures, as a practitioner in a country situation would not find much difficulty in curing; for which reason I should hesitate much to undertake such an operation as I am now

recommending on the knee, under such disadvantageous circumstances.

Such were the considerations which made me resolve to put this operation in practice the first favourable opportunity; which I did not long wait for, as, at the time when the experiments related above were made on the dead subject I had under my care in the Infirmary, HECTOR M'CAGHEN, a strong, robust, Scotch sailor, aged thirty-three, was admitted for a diseased knee of ten years standing. The joint, though pretty considerably enlarged, was by no means so much so as is frequently met with in scrophulous affections; yet the integuments were so tense, as to appear incapable of yielding to farther distention; the contraction of the Flexor Muscles was such as to draw back the leg, so as to form a right angle with the thigh, in which position it was immoveably fixed. Apparently some degree of union of the bones had begun to take place; but this could not yet be determined with certainty, as every attempt to communicate to the joint the smallest degree of motion, gave him the most excruciating pain.

Various means were used for his relief, and, amongst others, blisters in their fullest extent, without the smallest benefit; but, that I may not seem to say any thing to the discredit of a remedy in many cases so valuable, let it be understood, that, in this case, their application came too late, as it was pretty evident that Suppuration and Caries had taken place before he was admitted into the Infirmary, though as yet there was not any opening obtained. This poor man's sufferings, which had been some time great, were daily increasing, and his health daily declining, in such a degree, that he began to beg to have the limb taken off. This, however, I could not consent to do, without first proposing and explaining to him the extirpation of the joint, in order that he might have the chance of such a cure, if he chose to take it; although, for reasons already explained, I rather wished to make the first attempt of this kind on the elbow: besides, what made this case rather more unfavourable, was, that it was of the scrophulous kind, and that the motions of the foot and toes were but imperfect;

yet as these parts, as well as the muscles that move them, were evidently free from disease, I was in hopes this arose merely from the painful state of the knee; and as the disease was evidently confined to the articulation, and the man was free from scrophulous affection in every other part, I did not hesitate to propose this operation, to which he assented without much hesitation, and it was accordingly done on the 2d of July 1781.

In the performance of it one circumstance occurred, which I think necessary to mention particularly, as it led me, and consequently might possibly lead others, into some difficulty; which is, that I wished to avoid making the transverse incision, thinking it would be in my power, by a simple longitudinal one, after the Patella was removed, to raise the integuments so as to divide the lateral and cross ligaments, and readily dislocate the joint, so as to be able to turn out the heads of the bones alternately, and saw off just as much as I might find diseased; but in this I was greatly deceived, and found that I had not made sufficient allowance

for the difference between a healthy and a diseased state of parts: in short, there appeared such confusion of parts on opening the articulation, the ligaments being, in some parts, extremely thickened and horny, in others in a sloughy, suppurated state, with the Cartilages almost wholly destroyed, and the heads of the bones much eroded by the offensive matter, of which there was a good deal in the joint; besides, that some degree of bony union had already begun to take place between the head of the Tibia and the inner Condyle of the Femur; that, after spending some time in the attempt, and consequently making the operation much more painful and tedious, it was thought advisable to relinquish this idea, and to make the transverse incision, and divide the Femur above the Condyles, as has been already described, in giving an account of the mode of operating on the dead subject; in which I have likewise sufficiently described the manner in which the head of the Femur, as well as that of the Tibia, were removed; it is, therefore, unnecessary to repeat it here. The quantity of

bone removed was somewhat, though not much, more than two inches of the Femur, and of the Tibia rather more than one inch; which were but just enough to enable me to bring the leg into a right line with the thigh, the previous contraction of the Flexor Muscles being such as to keep the two sawn ends of bone in close contact. The only artery that was divided in the operation was one on the anterior part of the knee, which ceased to bleed before the operation was concluded, although the pulsation continued pretty strong in the ankle; the ends of the bones, however, particularly that of the Femur, bled pretty freely. It will readily be conceived, that there remained a considerable redundancy of integument; to support this, so that it might not fall inwards between the ends of the bones, and to keep the edges of the incisions in tolerable apposition till they should acquire some degree of firmness, a few stitches were passed through the skin, as well along the course of the transverse incision, as of that part of the longitudinal one that extended up the thigh; the lightest superficial dressings only

were applied, and the limb placed in a case of tin, sufficiently long to receive the whole of it, from the ankle to the insertion of the Glutæus Muscle.

The man passed the day in a good deal of pain; had frequent vomitings, and lost a good deal of blood; so that in the evening, about six o'clock, I found him very languid, with a low, weak pulse, of about 120. On loosening the bandages, which were full of blood, and become very tight and uneasy, I found that the hæmorrhage had nearly ceased, and the man became much easier; the cavity of the wound was filled with coagulated blood, with which the integuments were distended to a very considerable size: this I did not choose to remove, but contented myself with again dressing superficially with wax and oil, laying over it compresses dipt in cold Aq. Saturn. which were ordered to be kept constantly wet; and an anodyne draught was given him.

July 3d.—Had passed a restless night, but without much pain, or any farther hæmorrhage; continued to have frequent sicknesses,

and the integuments still continued much distended, but the leg and thigh remained free from swelling. Ordered to take the Saline Draughts in the effervescent state; for drink to have butter-milk and lemonade, and to repeat the anodyne in the evening.

4th.—Had passed an easy night, and slept a good deal; had still some sickness, but begun to have a desire for a little solid food, which was allowed him; the coagulated blood beginning to dissolve and come away, and the tension to abate. Ordered to continue the same medicines and applications, with the addition of compresses, dipt in brandy, laid under each side of the limb; and to have the pillows and bandages sprinkled with Sp. Vin. Camph. to correct the foetor.

5th.—Had not passed so good a night, complaining much of pain in the back, from posture; had not any pain of consequence in the limb; pulse 120, but very little heat or thirst; had no sickness, except when he took the saline medicines, which were ordered to be discontinued. As he had not yet had a stool since

the operation, ordered to take Ol. Ricini ad Alvi Solution. and then to begin with Infus. Cortic. Peruv. and to repeat the anodyne in the evening. Removed the stitches from the inner transverse incision, in hopes of giving a more free discharge, but without immediate effect, as union seemed, in a great measure, to have taken place; filled the cavity of the wound lightly with dry lint.

6th.—Had had two stools; no more sickness; pulse 112; had some pain the day before, in consequence of the motion given to the limb in adjusting the bandages, and in going to stool, but had passed a good night, and the limb very cool and easy; the swelling a good deal subsided; the lower end of the inner transverse wound had opened a little, giving vent to some matter; the outer incision united, and the stitch removed; ordered to continue the bark and the anodyne.

7th.—The stitches above the knee seemed to be doing mischief, by confining the integuments too much; the lower one was therefore removed, which gave a good deal of liberty; the

wound opening about an inch giving much ease; the fore in general looked very foul and sloughy, and the discharge very large and foetid; in other respects as well as on the 6th. Ordered to change the infusion of bark for the decoction.

9th.—The higher stitch on the thigh had torn out, and the wound had opened more largely, but looked cleaner, and the discharge in general was more moderate. Some uneasiness had been occasioned by the matter being too much confined by the pledgets; it was therefore ordered, that, after the cavity was lightly filled with dry lint, a turnip poultice be laid over it. This application I find in general less uneasy than the carrots, and remarkably speedy and powerful in correcting the foetor of putrid ulcers, and therefore particularly valuable in an hospital. I believe it would have been better had I removed all the stitches at the first or second dressing, as their only use was to support the lax integuments, until they should acquire sufficient firmness to prevent them from falling in between the ends of the

bones, which end was sufficiently answered by the inflammatory thickening in twenty-four hours. I am likewise of opinion, that it would have been better, had I, at the time of the operation, filled the cavity lightly with dry lint, to have restrained the effusion from the ends of the bone, and afterwards to have postponed dressing the wound as long as possible.

10th.—The fore much sweeter, and the discharge improved in quality, and diminished in quantity; granulations beginning to arise from both ends of the bone; pulse 108; belly regular. His bed becoming very uncomfortable, he was removed into a fresh one.

12th.—Had been a good deal disturbed the two last nights with spasms in the thigh; his general health, however, did not seem hurt by them, and the whole inner surface of the wound appeared granulated, and the bones nearly covered;—was ordered to increase his anodyne to 40 drops, and allowed a pint of ale per day.

14th.—Had passed two better nights, though the spasms were still troublesome; had gotten

the limb into a bad position, in consequence of turning too much on the side, the posture in which he had been accustomed to sleep for several years, but at present a very unfavourable one, as by this means the end of the Femur was raised too high, and cast outwards: this was rectified, though not without some pain and trouble. It may be sufficient to mention here, once for all, that this circumstance gave me a good deal of trouble at different times during his whole confinement.

15th.—Had passed a good night, free from spasms, without opiate; ordered to discontinue the poultices, and, in their stead, to have cloths dipt in a mixture of equal parts of lime-water and brandy, and a somewhat tighter bandage.

17th.—The discharge at each dressing not nearly half as much as on the 15th, though the wound, which had hitherto been dressed twice a day, was reduced to one dressing only.

21st.—The discharge no more than sufficient to moisten the dressings; the cavity in a great measure filled up, and the wound contracted to less than half its original size; the inner end

of the transverse incision united, and nearly healed. The integuments, which, on the decline of the swelling, had been a good deal puckered on each side of the knee, had now adapted themselves very much, though there was still an overplus. Changed his bed again.

26th.—Complained that the bark disagreed with him, and that he had two or three days vomited it up in the afternoon, and with it the greatest part of the food he had taken; on which account it was discontinued: he had at that time a good deal of night-sweats.

28th.—The sickness gone off, and the sweatings abated. There appeared a small quantity of matter formed under the Cicatrix, on the inside of the knee, and was making its way through a small opening, into which a bit of sponge was introduced.

31st.—An opening, about an inch in length, was obtained in the old Cicatrix, by means of the sponge, and gave vent to about three ounces of pus.

August 2d.—The discharge from the last mentioned opening very trifling; the general

wound contracting very fast; the granulations from the two ends of the bone in a great measure united; still sweated a good deal in the night. Ordered to take Elixir Vitriol. Acid. Gutt. xx. terquaterve de die.

4th.—A small pustule, not larger than a nut-kernel, which had been observed two or three days on the inside of the leg, a little above the calf, in the place where he had formerly had an issue, but appeared too trifling to deserve notice, burst this day on taking off the dressings; and I was not a little surprised to find that it led into the cavity of an abscess, from which issued four or five ounces of pus, the principal lodgment of which was in the ham, where the skin seemed very thin; and I was in hopes a completely depending opening would soon be obtained. Two or three small scales of bone, being exfoliations from the inner edge of the Femur, not larger than a sixpence, came away this day.

7th.—The sweatings much abated, and the discharge from this last opening very trifling.

9th.—Observed two other small sinusses, one

on the inside of the knee, the other on the anterior part, too trifling to deserve much notice. He had had, during the preceding night, a good deal of pain down the shin; the union, however, seemed to be gaining strength, as, on moving the foot from side to side, I observed that the motion was communicated in some degree to the thigh.

14th.—Still complained of pain down the shin, and on the outside of the leg; and, on examining, I observed near the head of the Fibula, a small lodgment of matter, which, on pressure, was discharged from the general wound; I therefore made a small opening in the most depending part, and passed a seton through.

18th.—Thinking the seton had sufficiently done its office, I removed it; and, finding a good deal of excoriation and pustular eruption on the thigh, changed the Aq. Calcis for Aq. Saturn. with brandy, of each equal parts.

21st.—The excoriation and eruption much diminished; still some little lodgment on the outside of the leg, but no pain; the union evidently gaining strength. Had his bed, splints,

&c. again changed, which he bore with much less pain than any of his former movings.

23d.—Finding the opening I had made on the outside closing up, and the quantity of matter increasing, introduced a fresh thread.

Sept. 1st.—Dilated a small sinus on the inside of the knee; the anterior wound reduced to a very small compass; the union become so strong, that whatever rotatory motion was given to the leg, was communicated to the thigh, though the Callus was still flexible.

8th.—Began to get out of bed, and to remain up a few hours every day; little or no discharge from the orifice in the calf of the leg, nor any sensible lodgment in the ham; his general health very good; the union become so strong, that he could, by taking hold of the leg with one hand, raise the limb, and turn it as he pleased without pain, though the Callus was still flexible; removed the seton.

15th.—No fresh collection where the seton had been, and the opening seemed to be healing up.

October 1st.—The wound on the outside

completely healed; the cavity of the abscess in the ham pretty well consolidated; the orifice in the calf of the leg healed, and the anterior wound reduced to a very trifling excoriation of a very small surface; a very small discharge still remaining from the inside of the knee; the Callus not sensibly improved for the last three weeks.

20th.—Had a slight feverish attack, accompanied with a slight erysipelatous inflammation on the knee, which shewed a disposition to break out afresh. As there was great reason to believe that this might be in a great measure owing to long confinement in an hospital, it was thought adviseable to remove him into the country. Accommodations were therefore procured for him in a farm-house about three miles from town, to which he was removed on the 22d: the Cicatrix of the anterior wound nevertheless gave way, degenerating into a spreading ulcer, which, in a few days, extended to the size of a crown piece. He was put upon the use of the Cortex in substance, and had the fore dressed with Tinct. Myrrh. cum Mell. Rosarum.

Nov. 4th.—His health again perfectly re-established, and the fore again become clean, and in a healthy state; the Callus seeming to acquire firmness.

Dec. 1st.—The fore reduced to a very small compass, and the Callus sensibly improving; began to walk about on crutches.

15th.—The Callus become sufficiently hard to enable him to raise the limb, with the assistance of a hand under the thigh, without taking hold of the leg at all, and without the union appearing to give way in the least; though, upon forcible handling, it had still an obscure degree of flexibility.

31st.—Strong enough to raise the limb without the assistance of his hand.

Jan. 15, 1782.—The Callus no longer at all flexible.

30th.—A small abscess opened on the inside of the knee, but almost too trifling to be worth mentioning.

Feb. 28th.—All wounds perfectly healed, and his strength daily improving.

March 23d.—I was alarmed by a messenger,

informing me that the man had fallen and broken his leg. This I had the satisfaction to find was in some degree a false alarm; he had however fallen, owing to the breaking of one of his crutches, and bruised the outside of his knee very much. This accident was followed by a good deal of pain, pretty high inflammation, and a large abscess, which burst in about a fortnight; and, when the pain and soreness were gone off, so that he could bear to have the limb handled with some degree of force, I found that the Callus was again become somewhat flexible; nor did it recover its solidity before the middle of June, during the greatest part of which time, the orifice, by which this abscess discharged itself, continued to ouze, though in a very trifling quantity. After this dried up, all the sores remained perfectly well. He now began to make every day more use of the limb; but, as it must be expected that muscles, which had been so very long out of action, and a limb that had suffered so great a waste, must be very weak, it was not before the end of July that they acquired sufficient firmness to

support the weight of his body. He then complained that his foot and toes, though he had recovered the perfect motion of them, were yet so weak, that it was with difficulty that he could support his whole weight on them, and begged to have a high-heeled shoe; he was therefore allowed one with a heel an inch and a half higher than the one he wore on the other foot; with this he was able to walk with great ease and firmness, without even the assistance of a stick, or of any kind of splint to support the union. He continued, nevertheless, when out of doors, to make use of a crutch and stick, which, however, I expect he will soon lay aside: and, on his going to work, he was furnished with a case of thin cow's leather, made to lace from the ankle to the upper part of the thigh, strengthened by a piece of thin plate-iron up the outside, to guard him from injury. The limb was at this time nearly three inches shorter than the other; the knee very slightly bowed outwards, owing to the difficulty of keeping him in a good position, which I have already mentioned, though not in

such a degree as to occasion any deformity, but what might very readily pass unnoticed by an inattentive observer. The redundant integuments form a small plait on each side of the knee; the muscles, as may naturally be expected, are yet smaller than in the other leg and thigh; and the foot, by an exact measure, taken by the shoemaker who made his high-heeled shoe, three quarters of an inch shorter than the other. It will appear, by this account, that but a very small part of the length lost by removal of bone, was in this case regained by Callus; but let it be remembered, that I have already remarked, that the previous contraction of the flexor muscles was such, as to make it impossible it should be otherwise, although I made some attempts, during the cure, to increase the length, by placing the limb in a state of moderate extension*.

Whoever barely considers the length of time from the performance of the above operation,

* Since the above was written, he has laid aside his crutch, has gotten a strong useful limb, free from pain or swelling, and is gone to sea.

to the completion of the cure, will perhaps think the process more tedious and troublesome than the event can compensate. On this account, perhaps it may not be amiss to recapitulate the following circumstances, viz: That the operation was done on the 2d of July; that the first symptoms were by no means severe; that the discharge, which for some days was very considerable, as must be expected from so large a surface of wound, was much diminished by the 10th; and by the 21st was no more than sufficient to moisten the dressings; and that by this time the cavity of the wound was in a great measure filled up, and the ends of the bones covered by granulations: That of the subsequent collections of matter, only two were of any importance; nor were these such as to occasion the smallest apprehension of danger, or material difficulty: it was pretty evident that they were occasioned by the portion of diseased capsular ligament, which was unavoidably left in the posterior part; and probably they might have been prevented by a depending opening, which might have been

made at the time of the operation, and perhaps effectually maintained, by introducing a seton into either extremity of the transverse wound, and bringing it out at the ham, taking care to avoid the vessels: That the confinement to bed was between nine and ten weeks; which, as well as the time which the Callus took in forming, was not longer than many compound fractures require, in which it is nevertheless pretty clear that the event must be favourable. On the whole, from what I now see of this man's limb, I do not hesitate to declare, that it appears to me so much more valuable than any artificial one, that, was I in his situation, I should infinitely prefer the former, at the price which he has obtained it: nor shall I hesitate to repeat and recommend the same attempt to others under similar circumstances. At the same time, I must leave every Surgeon at liberty to determine for himself what he would recommend to his patient; and every unhappy sufferer to fix his own value on his own limbs, and on the time and pains which it may be

likely to cost him, either to preserve or part with them.

Whatever objections, however, may be made to the operation I have been describing on the knee, I apprehend few will refuse to subscribe to the utility of a similar one in affections of the articulation of the elbow. Though here, perhaps, it may be objected, that I am recommending an operation, which I have not yet performed on the living subject. I grant it; yet think myself authorised to do so, by the success of the attempt on a joint, in which I have sufficiently shewn, that the undertaking is attended with much greater difficulties and hazard; and by the event of the following case, which fell under the care of my worthy friend and colleague Mr ALANSON, already sufficiently known to the surgical world, by his excellent Observations on Amputation; and which will be allowed to be much to my present purpose, as it was a case in which the same end was in some measure obtained, though by Nature alone, without the aid of instruments.

ELIZABETH MALCOMB, a woman upwards of

fifty years of age, was admitted into the Infirmary on the 15th of March 1781, for an extensive Gangrene in the Arm, occasioned by a fall on the point of her elbow: the Gangrene destroyed the greatest part of the Extensor Muscles, and integuments on the back part of the arm, laying the Os Humeri bare, nearly as high as the shoulder, and laid the joint of the elbow largely open; yet, as the Capsular Ligament was wholly destroyed, the subsequent symptoms were by no means urgent. In a few weeks the Olecranon exfoliated, as did likewise the inner tuberosity of the Humerus, with a scale about six inches long, one in breadth, and about as thick as a shilling, from the back part of that bone: the joint was soon filled by granulations, and healed over; a firm Callus obtained, and the woman was discharged with a stiff elbow on the 19th of July following, having only a very small superficial sore unhealed in the upper part of the arm, for which she did not think proper to remain longer in the hospital, as her health was rather in a declining state. It can hardly be necessary to point out,

that this patient's fore-arm was kept in a state of flexion; nor that this is the position I should recommend after the extirpation of the elbow, as this is a practice which has long been sufficiently established in the treatment of every injury and disease of that joint, in which the recovery of perfect motion is at all doubtful. But whether this should in all cases be such as to make the fore-arm form a right angle with the Humerus, or whether sometimes a more or less acute one; and whether the position of the hand should in every case be an exact middle state, between the extremes of Pronation and Supination; are points which can only be determined with accuracy, by considering the occupation in life of each individual patient. This ELIZABETH MALCOMB, as will be seen by the dates, was in the Infirmary at the same time with HECTOR M'CAGHEN; and her cure was drawing toward a conclusion when his knee was taken out, and gave me no small encouragement to undertake that operation.

After all, I beg I may not be so far misun-

derstood, as to have it supposed that I am sanguine enough to imagine, that the method I have been recommending will certainly succeed in every case. I know the contrary, and fear that, after the Chirurgical Art has done all that it is capable of, many of these diseases will still occur, in which Amputation alone can preserve the life of the patient. Of these I have met with three cases within the few last months: two were knee cases, in which the disease of the soft parts was too extensive to encourage the attempt; and the third an elbow case, in which, not only the extent of caries was too great and uncertain, but the muscles moving the hand and fingers were so cemented together, as to have left these parts altogether useless, could they have been preserved. I have, nevertheless, reason to believe, that, even in these cases, extirpation might have succeeded at a more early period of the disease; but the misfortune is, that persons labouring under diseased joints, are but seldom willing to submit to any great operation, until their lives are brought into imminent danger; in which state,

SECOND CASE

O F

MR PARK,

As communicated by him in a Letter to Dr SIMMONS, 5th
November 1789, and published in the 11th volume
of the London Medical Journal.

IN the year 1783, I ventured to obtrude on the world a small Pamphlet, pointing out a mode of treating some of the affections of the large articulations, which I then believed had not been attempted by any other practitioner.

To the history of the case of HECTOR McCAGHEN, there related, I have now to add, that he afterwards made several voyages to sea; in which he was able to go aloft with considerable agility, and to perform all the duties of a

seaman: that he was twice shipwrecked, and suffered great hardships, without feeling any farther complaint in that limb; but was at last unfortunately drowned, by the oversetting of a flat in the river Mersey.

As the propriety, however, of adopting such a practice can only be determined by a number of experiments, I feel myself equally bound to communicate to the Public the event of my second attempt of this nature, although it proved as unfortunate as the first was successful.

The subject of this operation was CHARLES HARRISON, aged thirty years, by trade a wheelwright, and to appearance a strong, robust man; but who was, as I afterwards learned, of a highly scrophulous family.

His knee, which had been diseased about three years, was more enlarged than that of HECTOR M'CAGHEN; the disease in the soft parts was more extensive; and a considerable abscess had formed, which extended some inches below the joint, on the outside of the leg, but had not yet opened.

The operation was performed agreeably to

the patient's choice, on the 22d of June, with little variation, as to the *modus operandi*, from the former one, except that an opening was first made into the abscess, as well to answer the purpose of a depending drain afterwards, as to afford an opportunity of examining the state of the fibula, which was not found diseased.

Two small arteries were taken up, and the cavity lightly filled with lint. An anodyne was given immediately after the operation; notwithstanding which, he passed the day in a good deal of pain; but, by repeating the opiate in the evening, had an easy night.

The wound was not opened till the 27th, when only the bandages and external dressings, which were becoming offensive, were changed, and he was removed into a fresh bed. The knee appeared large, but the leg and thigh were pretty free from tension; the discharge was moderate in quantity, and good in quality, coming mostly from the depending opening; and the man seemed very well in his general health.

The dressings did not all come out till July the 1st, when the whole surface of the wound looked clean, and the granulations were so luxuriant, that the ends of the bones were covered, and the cavity was in a great measure filled up.

July 8th.—The discharge was much diminished, very little coming from the depending opening.

—— 20th.—Some degree of union appeared to have taken place; the bulk of the knee, and the surface of the wound, were diminishing apace. Some pus, however, was pressed out of the granulations, as from a sponge.

—— 24th.—He had a diarrhoea during the two last days. A small quantity of pus had made its way through the cicatrix of an old issue below the inside of the knee, but no more could be pressed out of the granulations. The union appeared to be gaining strength.

—— 31st.—He had gotten the limb into a bad position; the wound was a good deal loosened, and there was rather more discharge; the bulk of the limb, and surface of the wound,

were diminishing fast; the diarrhoea had ceased, but he had night-sweats, looked ill, felt languid, and complained of a good deal of pain in the other leg, which was swollen and œdematous.

August 10th.—The affection of the other leg was much abated.

——— 21st.—The sweats had ceased, and his strength was much improved. The discharge was small, and the union was apparently stronger than it had yet been. We now began to take him out of bed frequently.

——— 26th.—He complained of more pain, swelling, and foreness. The union appeared more loose, and the discharge more considerable; but he seemed to be in tolerably good general health. About this time I learnt that his family were highly scrophulous.

September 7th.—The discharge was still considerable. He had been languid, and had but little appetite during the two last days; but seemed better to-day.

——— 14th.—The discharge was again become moderate, with appearance of more

union; and the healing of the wound was advancing.

September 30th.—He had a troublesome diarrhoea.

October 3d.—He had incessant bilious vomiting and purging, with severe griping, great internal heat, and troublesome aphthæ. By these complaints, he was suddenly brought into such a state, as to preclude every idea of removing the limb, could we have had ever so much reason to hope that, by so doing, we should have removed the whole disease. In this state he continued until the 13th, and then sunk, in spite of all our efforts.

Soon after the publication of my little pamphlet, the late Mr FILKIN, of Northwich, informed Dr BINNS, of this town, that he had performed a similar operation, about twenty years before, with success. The Doctor, at my request, applied to Mr FILKIN for the particulars of the case, but was disappointed in his attempts to obtain them; that gentleman being soon after seized with a paralytic affection, which greatly impaired his faculties, and

at last terminated in his death. I have been, however, since favoured with a letter from his son, at present surgeon in Northwich; of which the following is an extract:

“ You will, I fear, think me very remiss in
 “ not answering your kind favour long before;
 “ but as my father’s notes do not describe the
 “ case of the operation of the knee so plainly
 “ as I could wish, I have waited till an oppor-
 “ tunity occurred, when I could see the man,
 “ to have what he knew on the matter; and
 “ though all I can collect on the subject is ve-
 “ ry trifling, still I beg leave to send you what
 “ little information I have gained.

“ The patient was always of a scrophulous
 “ habit, and had for many years a tumour on
 “ the knee, which gradually increased in size,
 “ and to which every topical application was
 “ used without effect. By accident, falling
 “ from a horse, the patella was fractured, and,
 “ from a small wound, there was discharged
 “ about half a pound of foetid, foul-coloured
 “ pus. Amputation was immediately proposed;
 “ but the parents not consenting, my father

“ was called in. Having frequently thought
 “ this method might sometimes succeed, and
 “ having performed it once on the dead body,
 “ he proposed it to the parents of the patient
 “ in this case, though it was an unfavourable
 “ one, the patient’s general health being much
 “ impaired. The parents consenting, a day
 “ was fixed for the operation, which was per-
 “ formed on the 23d of August 1762. The
 “ ligaments were found in a very sloughy,
 “ suppurative state, with the cartilages greatly
 “ injured, and the heads of the bones much
 “ diseased, particularly the head of the tibia.
 “ The patella, with the head of the femur, and
 “ a portion of the tibia, were removed; a good
 “ digestion came on; the limb was kept in a
 “ straight position; and on the 21st of Novem-
 “ ber 1762, he was got so well as to require
 “ no farther attention.

“ I am extremely sorry I cannot give you a
 “ more particular description of this case; and
 “ regret much, that my father in his health did
 “ not inform either you, or our worthy friend,
 “ Dr BINNS, minutely of it. The person is

“now living, and sometimes goes to Liverpool,
 “where, if you will give me leave, I will de-
 “fire him to call upon you.”

A letter from Mr TYRE, of Gloucester, has
 the following paragraph, which he has oblig-
 ingly given me his permission to insert here: “

“Four or five years ago, I assisted the late
 “Mr JUSTAMOND in removing the olecranon,
 “and two inches of the ulna, continued from
 “that process, in a man who had a diseased
 “elbow joint; and I have lately met with a
 “boy, in whom an accident separated the os
 “humeri from its connection with the bones of
 “the fore-arm, and forced it, denuded of its
 “periosteum, through the integuments; I
 “sawed off two inches and a half of its length,
 “including the condyles. Both these cases
 “were completely successful.”

In a subsequent letter from Mr TYRE, in an-
 swer to my request, that he would favour me
 with farther particulars of the former of these
 cases, he says, “The patient, a man, had a ca-
 “ries in the superior extremity of the ulna; it
 “was not purely scrophulous, nor were the li-

“gaments so much thickened or diseased as we
 “commonly find them, when a white swelling
 “has suppured and ulcerated: the olecranon,
 “and two inches of the ulna, continued from
 “it, were removed. To render the separating
 “the ulna from its connection with the os hu-
 “meri more easy, a portion of the olecranon
 “was first chiseled off; the ulna, cleared from
 “the soft parts, was then sawed through; the
 “articular surface of the os humeri was not
 “taken off or scraped away; the radius was as
 “little meddled with as possible; nor was
 “there more of the capsular ligament extirpat-
 “ed, than what necessarily came away with the
 “portion of ulna: so that here the elbow joint
 “was not removed, but only the extremity of
 “one of the bones of which it is compounded.
 “The man recovered without the least unto-
 “ward symptom, and had a very useful arm:
 “the motions of flexion and extension, as you
 “may suppose, were almost lost, but he retain-
 “ed the power of rotating the hand.”

The account given of my little pamphlet, in
 the London Medical Journal, concludes with

faying, that, since its publication, the operation had been repeated with success, in the elbow, by an ingenious and enterprising surgeon of one of the London hospitals.—*Query.* Is not this the case I have just quoted of Mr JUSTAMOND*? Be that as it may; though Mr JUSTAMOND's operation be not a complete extirpation of the joint, it is certainly one of not less merit, less difficult execution, or less happy in its consequences.

* Mr Park is right in his conjecture: it was to the operation performed by Mr Justamond that we alluded. See Medical Journal, Vol. IV. page 282.—EDITOR.

Liverpool, November 5, 1789.

SUBSEQUENT OBSERVATIONS

BY

MR P A R K.

LIVERPOOL, 10th Sept. 1805.

THE foregoing little work, of which a second impression is now offered to the Public, was first published in 1782; but, I am mortified to say, that it has to this day produced very little, indeed, of the effect it was intended to produce. The opposition it met with, and the failure of my second operation of the same kind, so totally defeated my views, that I have not yet learned, that it has, hitherto, proved the means of saving a single limb in the whole of the British dominions: and, since its publication, this country has passed through a long

and bloody war, without this practice being at all adopted, or scarcely known either in the Army or Navy of Britain. In this state of neglect, and indeed oblivion, would my attempt, in all probability, for ever have remained, had not the late Mr MOREAU, an enterprising French Surgeon, taken up the subject, and carried his experiments farther than I ever ventured to attempt. It appears, by the statement of his son, that this gentleman and I entertained similar ideas, nearly at the same time, without either of us knowing of the other's intentions. The son's publication on the subject has lately fallen into my hands; in which I find some criticisms on my mode of operating: to which I have only to reply, that, it will be observed, that I have already acknowledged, that I by no means considered my method of operating as perfect, and that I left it to be improved by those, who might have more frequent opportunities of performing the operation. And, I now add, that I leave every Surgeon to chuse, which of the two modes he may find most suitable to his

own ideas, and to the circumstances of each particular case. The handsome manner in which Mr MOREAU is pleased to speak of my late publication, in different parts of his work, demands my public acknowledgments. I only lament that his work did not appear a dozen years sooner: however, as we are now but just entering upon the serious part of another war, I hope it is yet in time to do infinite good, by preserving a great number of limbs, if the knowledge of it can be generally diffused through the army and navy. When Mr MOREAU's work fell into my hands, Dr JEFFRAY was accidentally in Liverpool, where he first saw it, and thought the subject of sufficient importance, to induce him to take the trouble of translating it for the benefit of his Students. This translation he has consented to publish; and politely proposed that an impression of my pamphlet should accompany it, in order that they, who read Mr MOREAU's observations upon it, may, at the same time, see the work on which these remarks were made.

To this proposal I readily acceded, in hopes that more attention will be paid to the subject now, than it has hitherto received. When I speak of diffusing the knowledge of this subject through the army and navy, I feel myself justified in using this language, by having been assured by gentlemen of the profession, who had seen much service during the late war, that the only idea then entertained, respecting wounds of the large articulations, was, that such limbs were to be considered as fit objects for amputation.

I was in hopes that this idea had long since lost much of its weight, from the success that has attended the practice, that many have adopted, of sawing off the protruded heads of bones in compound dislocations; from Mr JUSTAMOND's removing the superior extremity of the ulna, in a case of caries; and from the still more enterprising attempt of Messrs WHITE and BENT, in taking off the superior extremity of the os humeri, long before I made my attempt on the knee, and proposed the same in the elbow. I trust, however, that Mr MOREAU's success will

give such encouragement to attempts of this nature, as will be productive of infinite benefit to mankind. His success will, I hope, prove sufficient, in some degree, to counterbalance the unfortunate termination of my second attempt on the knee—an account of which is given in the present publication: but without that counterbalance, I should hope, that a failure in a diseased joint, arising from a constitutional cause, in an unhealthy subject, of a highly scrophulous family, would not be considered as sufficient to prohibit a similar attempt on an articulation, suffering from an external injury, in a healthy subject. Much less should a failure in the knee discourage the attempt in the elbow; in which I have already shewn, that the operation was more easily practicable, the attempt much less hazardous, and the end to be obtained infinitely more valuable; if these facts were not too obvious to common sense, to require any explanation at all.

To the solicitude I have expressed, to introduce this practice into the army and navy, it

has been objected, that the accommodations, in these situations, are not always such as to admit of such attempts; and that the hurry of an action may often oblige a Surgeon to have recourse to the most expeditious method of saving his patient.

These objections I admit, to a certain degree. I allow, that the excision of the knee may be wholly inadmissible in ships, as the necessary state of quietude can hardly be obtained there, for a sufficient length of time, to accomplish a cure; and, perhaps, similar difficulties may occur in military hospitals, belonging to an army in action. But I cannot admit, that these difficulties can operate to such a degree, as wholly to prohibit the attempt in the articulation of the elbow. In the first place, I cannot conceive, that any circumstances, except profuse hæmorrhage, can render any operation so immediately necessary, as not to admit of the delay of a few hours; and this hæmorrhage may, indeed, arise from such injury to the principal vessels, as may preclude every attempt to save the limb. And here I beg leave to observe, that,

when the principal vessels of a limb are so much injured, as to render it doubtful whether the life of that limb can be preserved, Surgeons may carry their fears of making the experiment, from the apprehension of a fatal gangrene, to too great a length; for I am inclined to believe, that it is not, in every case, necessary to delay the amputation of a limb, in which a gangrene has commenced, till a separation has taken place, or even till the gangrene be stopt; provided it is clear, that the gangrene arises solely from a cause, so entirely mechanical, as the privation of the nourishment, by the accidental destruction of the arteries from which it derives its support: at least, I have met with one decisive proof to the contrary. In a case of popliteal aneurism, before any operation was performed, a gangrene took place; but stopt before it had made so much havoc, as to render it certain that the limb could not be rendered useful, provided the aneurism could be cured: the operation, therefore, was done, and was soon succeeded by a fresh gangrene, which was spreading rapidly, when I took off the limb, and the

patient recovered without difficulty. I therefore venture to start the question, Whether, in similar cases, the patient may not have a better chance for recovery, from the removal of the limb, as soon as it becomes certain that its life cannot be preserved (provided the amputation be performed, at least above the part in which the vessels are injured), than from waiting till a more accumulated mass of dead matter shall have exerted its deleterious effects on the system in general? But to return from this digression, I would ask, What an army or a navy Surgeon would do, if a man was shot through the middle of the os humeri, or bones of the fore-arm, without material injury to the large vessels, and without any very extensive comminution of bone, or laceration of muscles? I hope he would not, in such a case, be so strongly impressed by the fatal consequences that await the attempts to cure compound fractures in the London Hospitals, though under the management of, perhaps, the first Surgeons on the surface of the globe, as to think of amputating the limb; especially when the case, with which very severe injuries of this

kind recover under the care of Surgeons of very inferior abilities, but placed under more favourable circumstances, not only in country situations, but even in County Infirmaries, is universally known. I trust he would attempt a cure, by removing all splinters; by sawing off the inequalities of the fractured extremities of the bones; by applying easy dressings; and securing the limb in a quiescent state, by suitable splints and bandages. Where, then, can be any greater difficulty, or will more time be required in accomplishing the same end, when the injury is in the articulation, than when it is in the middle of either humerus or cubit? Or why should we apprehend more danger in the one case than in the other, now that Mr MOREAU has adduced three cases, in which the ends of both bones were removed—Mr JUSTAMOND one, in which the upper extremity of the ulna—and Mr WAINMAN one, in which the lower end of the os humeri, was taken off?—To these I may here be allowed to add one more, in which the same end was obtained, as in Mr WAINMAN's case, though with a good deal more difficulty.

A young gentleman, of the name of WARDELL, about 14 or 15 years of age, fell into the hold of a vessel, and received a very severe injury in the arm. The os humeri was broken, very near the elbow; the fractured extremity was forced through the wound, immediately above the inner tuberosity; the point of the olecranon was likewise broken off; I dilated the wound, sawed off the extremity of the protruded bone, and removed the portion of the olecranon, which was detached from the ulna: by these means, I gained room to introduce my finger into the wound, to examine the state of the joint, which, I found was laid open; the ligaments were torn off from the head of the bone, about half way across the joint; but remained firmly attached to it on the opposite side, towards the tuberosity. After some deliberation, it was judged much more likely, that the broken off part of the bone would remain a dead mass, and prove such a source of irritation, as would defeat every intention of cure; than that it would unite to the sawn extremity by callus: it was therefore decided to remove it. This proved a tedious and

troublesome operation; yet was effected by means of a curved probe-pointed bistoury, conducted by the point of the finger; and the wound was closed by sticking plaister. The cure of this injury was interrupted by one or two abscesses; but not such as excited the smallest apprehension for the safety of either life or limb; and he now enjoys considerable strength of the arm, with every motion, very nearly perfect.

A Sketch of the Bones accompanies this: the pieces of bones themselves are in the possession of Dr WARDELL, Inspector of Military Hospitals, the young gentleman's uncle.

Having spoken of sawing off the protruded ends of bones in compound dislocations, I take this opportunity of expressing a degree of concern, to find this practice not so universal as I once thought it was. A gentleman, now established in Liverpool, but who received his education at a considerable Infirmary in the West of England, assures me, it was till lately, if it does not still continue to be, their pretty constant practice, to amputate compound disloca-

tions. And a young gentleman, a native of a town in the North of England, where there is a very considerable Infirmary, attended by Surgeons of deserved eminence, was under my care, for an injury of this kind. On his return to his friends, after his cure, he found the Surgeons there agreeably surpris'd with the success of his case; saying, that they had only made that experiment once in their Infirmary; that it failed then, and they had not repeated the attempt.

A short account of this gentleman's case may not be improper here. He was thrown out of a gig, at full speed; by which accident, the ankle was dislocated, and the lower extremity of the tibia forced through a transverse wound, about four inches long, so as to protrude very considerably. This protruded part was sawn off, about an inch and half in length, and the edges of the wound brought together by a few stitches; the limb laid in a relaxed position; the air excluded; and as neither pain nor discharge, except the hæmorrhage of the first day, made it necessary to expose the wound, it was not uncovered till the end of the third week; when it was

found perfectly united by the first intention; become a mere superficial scratch, which soon cicatrized completely; and not a drop of matter was ever perceived to be discharged from, or collected in the joint. It will readily be conceived, that the soft parts would remain, for some time, in a thickened, œdematous state, and the joint very little moveable. In a reasonable time, however, motion began to be recovered, and every action of the joint is now as perfect as in the other ankle; and such a degree of strength does he enjoy (although the limb is shortened in a degree nearly equal to the bone removed), that he is able to walk a whole day in taking the diversion of shooting, and to dance whole evenings without inconvenience.

I have seen some compound dislocations, under the care of Surgeons in small towns, in the neighbourhood of Liverpool, forcibly reduced, without taking off the ends of the bones. In these, the subsequent symptoms were abundantly more troublesome; but even these got well, without removing the limbs.

It has been the invariable practice at the Liverpool Infirmary, for more than thirty years, to take off the protruded extremities of bones, in cases of compound dislocations, and, I believe I may say, with invariable success.

END OF

MR PARK'S COMMUNICATIONS.

C A S E S
OF THE
EXCISION
OF
CARIOUS JOINTS.

BY P. F. MOREAU,

De Bar-sur-Ornain, M. D. de l'Ecole de Paris.

IL est rare que l'on arrive tout-à-coup à l'évidence: dans toutes les sciences et dans tous les arts, on a commencé par une espèce de tâtonnement.

LOG. DE CONDILLAC, chap. ix.

TO THE MEMOIR
CASES

OF THE
EXCISION

BY
GARRIGUS JOINTS
A. M. PERCY

BY P. F. MOREAU

DEPUTÉ DU DÉPARTEMENT DE LA SEINE, M. D. DE L'ÉCOLE DE MÉDECINE

PROFESSEUR D'ANATOMIE, M. D. DE L'ÉCOLE DE MÉDECINE

P. F. MOREAU

Il est rare que l'on trouve dans les livres de médecine, dans les livres de chirurgie, ou dans les livres de médecine, une description si complète de la maladie.

Les deux volumes, chap. ix.

TO THE MEMORY

OF

MY FATHER,

AND TO

A. M. PERCY,

PROFESSOR IN THE COLLEGE OF MEDICINE AT PARIS,

INSPECTOR GENERAL OF HOSPITALS, &c.

P. F. MOREAU.

TO THE MEMORY

INTRODUCTION

OF

MY FATHER,

AND

A. M. PERCY,

PROFESSOR IN THE COLLEGE OF MEDICINE AT PARIS,

INSPECTOR GENERAL OF HOSPITALS, &c.

F. F. MOREAU.

INTRODUCTION.

IN writing this dissertation, I have studied to make it a practical work; I have avoided speaking of Caries, in a general and scholastic way; I have confined myself, entirely, to one single point, on which, I hope, I can throw light. Therefore, whatever my opinion, respecting definitions, and general principles, causes, diagnostics, prognostics, &c. may, in other respects, be, the reader need not expect to meet with any thing concerning them here.

I confess, that if, in order to make what, in this little work, I have to state, be the more easily understood, I did consider myself under any necessity of saying what Caries is, I would be

very careful not to compare it to ulceration in soft parts; for, independent of the error, that must be, in any comparison between parts which differ so widely from one another, in organization as well as function, the particular characters of the two diseases are materially different from one another. Besides, every description of a sensible object, to be just, ought to be a picture of its most striking features.

I doubt, whether those, who have been practically engaged in the treatment of caries, have been able to derive any advantage from this division of the disease into the dry, the moist, &c. But, young though I be, I have been already able to see, that this classification is of little value; for, instead of pointing out any real differences between distinct and separate species, it presents, in most cases, nothing more than different stages of the same disease. The late Dr MONRO* has made a division of caries, that is still more extraordinary. He speaks of the dry or gangrenous caries; the

* Medical Essays, Edin. vol. v.

worm-eaten caries, or ulceration of the bone; the carnous caries, with spongy granulations; the phagedenic caries, with unhealthy granulations; and different kinds of caries, that are symptomatic. I quote no other authors. These are sufficient to shew, that, on this point, medical men by no means agree. We need not be surpris'd at this, for none of their classifications rest on the basis of accurate observation. I attempt no divisions. It will be sufficient, if I state distinctly the characters of the diseases, of which I propose to give some account.

The treatment of caries, situated in the body of a bone, has, long ago, been greatly improved. It is well known, that TROJA, TRIOEN, DAVID, WIEDMAN, and other able surgeons in Paris, were acquainted with other resources, than those of that timid practice, which contents itself with topical applications; and, which is worse, expects, from time, a cure, which it dares not attempt itself. My father left me some interesting cases on this subject; which, at a future period, I shall turn to use. But, as they are not immediately connected

with the subject of this dissertation, I cannot give them a place here.

The spirit of observation had raised surgery so high, during the last age, that it is surprising we have not been more familiarized with bold ideas. Men, even of enlightened understandings, are so apt to found their opinions on analogy, and on what they have been accustomed to, that unexpected discoveries will always meet with opposition, till repeated experience enforce conviction. The method, which I have to propose, for the cure of caries in several joints, is, as yet, so little known, that, with all the experience I have had, I should be afraid to mention it, if I could not bring forward witnesses, whose testimony will have the greatest weight.

In the year 1784, Mr PARK's observations on cutting out the articulating ends of the bones of the elbow and knee joints, were translated and published in France, by the celebrated Professor LASSUS; whose authority, one would have thought, might have procured for them a favourable reception. They were received with

astonishment; and so far were they from gaining credit, that, even so late as 1789, they had acquired so small a number of partisans in the academy of surgery, that some cases of a similar kind, which were presented to the academy by my father, were rejected; though they were of such a nature, and stated in a way that might have deserved a more favourable reception.

He had long felt the inefficacy of the means, usually employed, for the cure of caries; and being accustomed to deviate from the usual routine of practice, he had, on the 13th of August 1782, cut out a caries of considerable extent, from the lower end of the leg bones of a man, called LECHEPPE. The success of this operation was so complete, that, in drawing the conclusions, to which he thought it naturally led, he expressed himself in the memoir, which he presented to the academy next year, in the following terms.

“Caries in joints is accounted an incurable disease, requiring amputation. In cases, where every other method of cure has been

“ tried in vain, might we not attempt to save
 “ the limb by an operation, somewhat like am-
 “ putation ?”

He takes, as an example, the elbow joint,
 and goes on thus.

“ Although the caries should have affected
 “ the whole of the joint, yet, even in such a
 “ case, I would not hesitate to cut it out. I
 “ would bring the cut ends of the bones toge-
 “ ther; and while the contraction of the mus-
 “ cles would retain them in contact, I would
 “ keep the limb fixed, as in cases of fracture,
 “ and wait patiently, till nature should unite
 “ the ends of the bones together by callus.”

Farther on, he adds.

“ Surely, there are many other circumstan-
 “ ces, which should determine us, in the treat-
 “ ment of severe complaints of the joints, to
 “ deviate from ordinary practice.”

That the value of these quotations may be
 fully understood, it should be stated, that the
 above mentioned memoir was written in the
 year 1782: and, I believe, I do not risk much,
 when I say, that the discovery was from that

moment made; and that my father waited only for an opportunity, to carry the ideas he entertained into execution. The work of Mr PARK could not have been consulted, for it did not appear in France till the year 1784. Without wishing to take away from the author of that work, the tribute of gratitude which is his due, it may be observed, that, besides the difference between Mr PARK's method of operating, and that of my father, Mr PARK inspires fear, rather than confidence; as is manifest, from the effect which his book produced on those who might have followed his example; among whom may be reckoned, his judicious countryman BENJAMIN BELL, who, in speaking on the subject, expresses himself thus*: "Al-
 " though the merits of the operation must be
 " determined by farther trials, yet the risk at-
 " tending it appears to be so great, that there
 " is much reason to suspect that it will never
 " be generally practised."

The reflections which suggested themselves to my father, from the successful case of LE-

* Bell's Surgery, vol. vi. p. 130, edit. 3d.

CHEPPE, determined him to remove the head of an os humeri, and the corresponding glenoid cavity, which were carious. This operation, which was performed at Coufance in 1786, in presence of M. BALTHAZARD, an able surgeon of that place, was followed with complete success; and, in the same year, an account of it was communicated to the academy of surgery, by whom it was favourably received; but, like the former, it was not published, and, in all probability, it remains among the unedited papers of that society.

In 1789, my father addressed to the same society, a memoir, the object of which was, to explain his new method of removing caries; and to point out the inefficacy, and the danger of the methods, usually practised. This essay, though supported by many facts, met with the most violent opposition. They found it more convenient to deny, than to examine the facts, on which it was grounded; and, instead of taking any trouble to ascertain their reality, they answered in a way that forbade all future inquiry, upon a subject, which deserved the

greatest attention. This, however, could not discourage my father; nor did it stop him in a career, in which none of his contemporaries seemed to have the courage to follow him.

The operation, which is the subject of the 4th Case in my book, and is one of Caries of the Knee, was performed in 1792, when the army of KELLERMANN passed through Bar-sur-Ornain, in their march to the camp at La Lune; and as Messrs PERCY and CHAMERLAT, surgeons general to the army, and many other surgeons of the first rank, were present, and assisted, it is not possible to suppose that the operation was not really performed.

This case demonstrated, more than ever, to M. PERCY, the possibility of such operations; which he had, indeed, performed already, in several cases of caries; and to which, since that time, he has had recourse, with so much success, in cases of Gun-shot Wounds in the joints, especially those of the shoulder and elbow.

M. SOMMEILLIER, a pupil of my father, and a well-informed surgeon, in that part of the country where I live, has likewise accomplished

surprising cures, by this method of management, which is too little practised.

I ought to mention, in this essay, the experiments of M. CHAUSSIER, who cut out the articulating ends of the bones, from the different joints of various animals.

M. PELLETON, the eminent surgeon in the Hotel-Dieu, who, even in 1789, had his doubts respecting my father's cases, will here, I am persuaded, allow me to mention the encouragement which he gave me to publish this work.

The excision of the head of the os humeri is somewhat better known, than the operation I am going to describe. Some English surgeons, since WHITE, have given examples of it. M. PERCY, who had performed it twice, previous to 1789, and with the most complete success, has, since that time, performed it in the army frequently, in cases of gun-shot wounds; in which, according to the rules of ordinary surgery, amputation must have been performed: and many of his colleagues have, by the same practice, saved the limbs, and perhaps the lives, of many of the wounded.

My father, as I have said, addressed his memoir to the academy, in 1786. M. PELLETAN seems to have been the only one, of all the members of the academy, who, since that time, has ever mentioned the subject *. And, as his opinion was different from that of the rest of the members of the academy, I have judged it right to publish the case, which has, indeed, led the way to the operations, of which I now propose to give an account.

* Cours de Clinique externe, à l'Hotel-Dieu.

my father, and have lately published his
memoirs to the academy, in 1760. Mr. PASTORAN
seems to have been the only one, of all the
members of the academy, who, at that time,
has ever mentioned the subject. And, as his
opinion was different from that of the rest of
the members of the academy, I have judged it
right to publish the call; which has, indeed,
led the way to the operations, of which I now
propose to give an account.

Comte de Clugny, 21.11.1760.

CASES
OF THE
EXCISION
OF
CARIOUS JOINTS.

CHAP. I.

ELBOW JOINT.

BEFORE I state the case, which I intend to bring forward, in proof of the necessity and utility of cutting out the Elbow Joint, when affected with Caries, I think it proper to consider, what the present state of surgery, on this point, is. And here I cannot have many authors to consult; for, it is not long since this subject has become an object of attention; and the operations, which have been performed, have been so troublesome, that surgeons have been afraid to attempt them.

Mr PARK is the only individual, of whom I need speak. He conceived the possibility of cutting out the carious extremities of the bones of the elbow joint ; but he gives no instance, in which he had actually carried this idea into execution. He only tried the operation on the dead subject ; and of that trial he gives the following account.

“ A simple longitudinal incision was made,
 “ from about two inches above, to the same
 “ distance below the point of the olecranon ;
 “ the integuments raised, and an attempt made
 “ to divide the lateral ligaments, and dislocate
 “ the joint : but this being found difficult, the
 “ olecranon was sawn off ; by which means
 “ the joint became so much exposed, as to be
 “ easily dislocated, without any transverse in-
 “ cision ; the lower extremity of the os humeri
 “ turned out, and sawn off, and afterwards
 “ the heads of the radius and ulna. This ap-
 “ peared a very easy operation, not consider-
 “ ing that this was a joint without disease,
 “ and in an emaciated subject, consequently
 “ one in which there was a great laxity of in-

“ teguments.’ In the diseased joint, I apprehend, the case will be found far different ;
 “ and that it will be necessary to make the
 “ crucial incision, and to divide the humerus
 “ above the tuberosities, in the manner I have
 “ already described, in the extirpation of the
 “ lower extremity of the femur.”

Mr PARK observes, and very justly, that to operate on the dead subject, and to operate on the living body, are two things, between which, no comparison can be made. In fact, the disease produces such a change in the appearance and condition of the parts, that our operation cannot, in the two cases, be the same. For when caries takes place in a joint, the flesh, which surrounds the joint, becomes swollen ; and the ulcers, which follow, produce an alteration in the tissue of the soft parts, to a greater or less degree.

Till the bone be laid bare, the surgeon cannot say, how much of it he shall be obliged to remove. The duration of the disease is a criterion, on which we cannot rely ; for, recent cases of caries, either from the causes by which

they were produced, or the structure of the bone affected, or the manner in which the disease has been treated, are, sometimes, more extensive than others of long standing. The swelling of the soft parts is a symptom, that is as deceitful; for it is always considerable, when a joint is affected with caries. The probe can give intimation, respecting the state of those parts, only, which it touches; and as it cannot be made to pass, but where the fistulous openings directly lead, it frequently happens, that the caries can be discovered only at at some single point, while yet the whole body of the bone may be diseased. The suppuration, the pain, inability to move the joint, &c. can give us as little information, on which we can depend.

It is, therefore, absolutely necessary, in performing the operation, that we have it in our power to stop, or to go on a little farther, according as the extent of the caries may be. It will be seen, in Case III. that my father made only one flap, because he found nothing which required to be taken away, beyond what, in

making that flap, he had laid bare. The method of operating, which Mr PARK recommends, does not admit of this resource; for, his longitudinal incision being insufficient, on account of the swelling of the soft parts, it becomes necessary to make another across, which produces four flaps. This multiplicity of flaps does not appear to me to be dangerous; but it is totally unnecessary; for we can come at our end, as well with two: and, I can assure the operator, that he will find himself much more embarrassed by four flaps, than by two. The direction, about removing the olecranon, if it be not carious, is at least useless; and, in general, it will not be found to be the most ready way of dislocating the humeral bone.

Mr PARK relates a remarkable case, from Mr WAINMAN, which seems to be strongly in favour of his ideas. This was “ A recent luxa-
 “ tion of the cubitus, occasioned by a fall from
 “ a horse, at full speed, which forced the os
 “ humeri through the common integuments, a
 “ considerable length into the ground, and the
 “ bone was quite denudated.—There was not a

“ possibility of reducing it, and I thought it
 “ most eligible to take off the limb, which the
 “ family objected to. I called in Dr TAYLOR,
 “ who was of my opinion, but it would not be
 “ complied with. We then judged it best to
 “ saw off the os humeri, which I did, about an
 “ inch above the sinus which receives the ole-
 “ cranon. I then placed the arm in such a po-
 “ sition, as I thought would be most advantage-
 “ ous, prognosticating an anchylosis would en-
 “ sue, in which I was much mistaken: the per-
 “ son is now living, and can perform all the
 “ motions of the joint, which is as flexible as if
 “ nothing had ever been amiss*.”

This case, which would be very important,
 were we considering the treatment of compli-
 cated dislocations, does not apply to the disease
 which I am considering here; because the joint
 and the flesh had undergone no change, by pre-
 vious and long continued disease; because it
 does not hold forth a method of practice, which,
 in caries, can be followed, &c. It should be

* The os humeri was dislocated inwards, and the heads of
 the radius and ulna were forced under the biceps muscle.

considered, that it is a more difficult thing, to lay bare, and cut out a carious joint, than it is to saw off the extremities of bones, accidentally dislocated, and brought naturally, if I may so speak, into view. In such a case, the surgeon acts as the accident directs; and no general method of practice can be laid down.

I know of nothing else, that has been published, on this operation. Many late authors have spoken of it; but they have contented themselves with mentioning briefly the directions of Mr PARK.

My father has, then, been forced to create his own method; and boldly to destroy a joint, which, before his time, no man dared to touch.

The operations, which I now am about to describe, will, doubtless, be repeated. Let those, therefore, who attempt to perform them, in cases of extensive caries, take care, that they have all their self-command about them; for this kind of surgery requires caution, but it forbids fear. It has become, as I have stated, familiar to several eminent surgeons in the ar-

my of the Rhine, whom their chief, equally daring as enlightened, persuaded, in cases of severe gun-shot wounds of the joints, to give it the preference to that procrastinating surgery, the source of uncertainty, of accidental mishaps, and of fatal risks; as well as to that destructive routine of ordinary practice, that cuts off a limb, as it were by storm, which, by an operation, wisely bold, might have been saved.

CASE I.

JAMES COLIGNON, son of Widow Colignon, innkeeper at Voie, in the Arrondissement of Commerce, and Department of the Meuse, was attacked, in the 19th year of his age, with a swelling of the left Axillary [maxillaire] Gland; which terminated, at last, in suppuration. Soon after the wound was healed, the joint became œdematous. Emollient cataplasms, of various kinds, were applied, for the space of six weeks; when an abscess formed on the inner condyle of the os humeri. This abscess was followed by others; till, after seven or eight months had been spent,

in fruitless medical management, he was left with two fistulous ulcers on the inside, and a third on the outside of the elbow. They communicated with the joint; the bones of which were felt, by the probe, to be bare. The matter discharged was a reddish serous fluid. When the joint was moved, the bones rubbed against one another, and a grating noise was distinctly heard. The skin, around the ulcers, was livid. The flesh was swollen and œdematous, all round the joint. In other respects, the young man was in tolerable health.

Things were in this situation, when I was consulted, on the 26th of June 1797.

The case was one, in which, perhaps, there was reason to suspect scrophula; but, the cases in which my father was concerned had shewn me, that the fear of scrophula is frequently chimerical, and ought not to be yielded to, except the existence of scrophula be rendered probable, by the presence of other symptoms. On this account, I determined to perform the operation, and in the following manner, without preparing the patient, in any other way, than by forbid-

ding him to eat any thing on the night before.

A table, about four feet high, was placed opposite to a light window. On this a bed was spread, on which the patient was so placed, upon his belly, that the diseased arm lay on the edge of the table, presenting to the operator, the posterior and inner side of the joint.

This position required, that the patient should be fixed in a way that is apt to excite fear; but when it is considered, that the surgeon is at his ease, while the patient is to undergo a painful operation, and must be retained in his place, so that the arm may lie fair to the operator, it will be seen, that I could not dispense with this precaution.

After having applied the tournequet, on the upper part of the arm, to guard against the unnecessary loss of blood, as well as to deaden the sensibility of the parts to be operated upon, I entrusted it to an intelligent assistant. The arm being in a state of semiflexion, I plunged a dissecting scalpel * in upon the sharp edge, or

* I prefer this instrument to the jointed bistoury, on account of its firmness.

spine of the inner condyle, of the os humeri, about two inches above its tuberosity; and, directed by the spine, I carried the incision down to the joint. I did the same on the other side. I then laid the two wounds into one, by a transverse incision, which cut through the skin and the tendon of the triceps extensor cubiti, immediately above the olecranon.

By these means, I got a rectangular flap, one end of which adhered to the flesh, on the posterior side of the arm. This flap I raised from the bone, dissecting it, from below upward; and I caused an assistant to hold it up, out of the way.

The posterior surface of the os humeri being now bare, I washed it, and wiped it with a sponge, in order to satisfy myself respecting the condition it was in. It was enlarged, and rough; the joint was filled with purulent matter, and contained a fungous substance that occupied the place of the cartilages, which had entirely disappeared. No doubt remained, respecting the propriety of removing this part; but, wishing to be certain whether the caries

had penetrated into the whole of its substance, I pared a little of it away, with a gouge. This trial fixed my resolution. I then separated the flesh which adhered to the anterior side of the bone, above the condyles, taking the precaution to guide the point of my instrument, with the fore-finger of my left hand; and, after I could pass the handle of a scalpel through between the flesh and the bone, I allowed the scalpel to remain there, and sawed the bone through upon it. I finished the removal of the piece, by raising and detaching it from all its adhesions. Perceiving that the bone was diseased, higher up, I was obliged to take away six or eight lines more*.

The most difficult part of the operation yet remained; for, I had to remove the upper ends of both the bones of the fore-arm.

My first flap being no longer sufficient, it became necessary to make another. I extended the lateral incision, at the outer side of the arm, carrying it downwards, along the external border of the upper part of the radius. I separated

* See the pieces that were taken away, Plate I.

PLATE I.



Fig. 6.



Fig. 7.



Fig. 5.



Fig. 4.



Fig. 3.



Fig. 2.



Fig. 8.

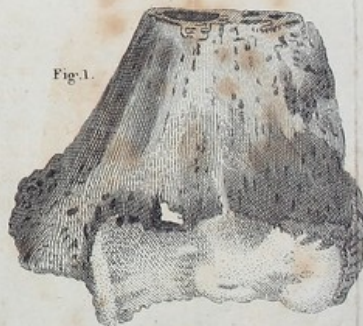
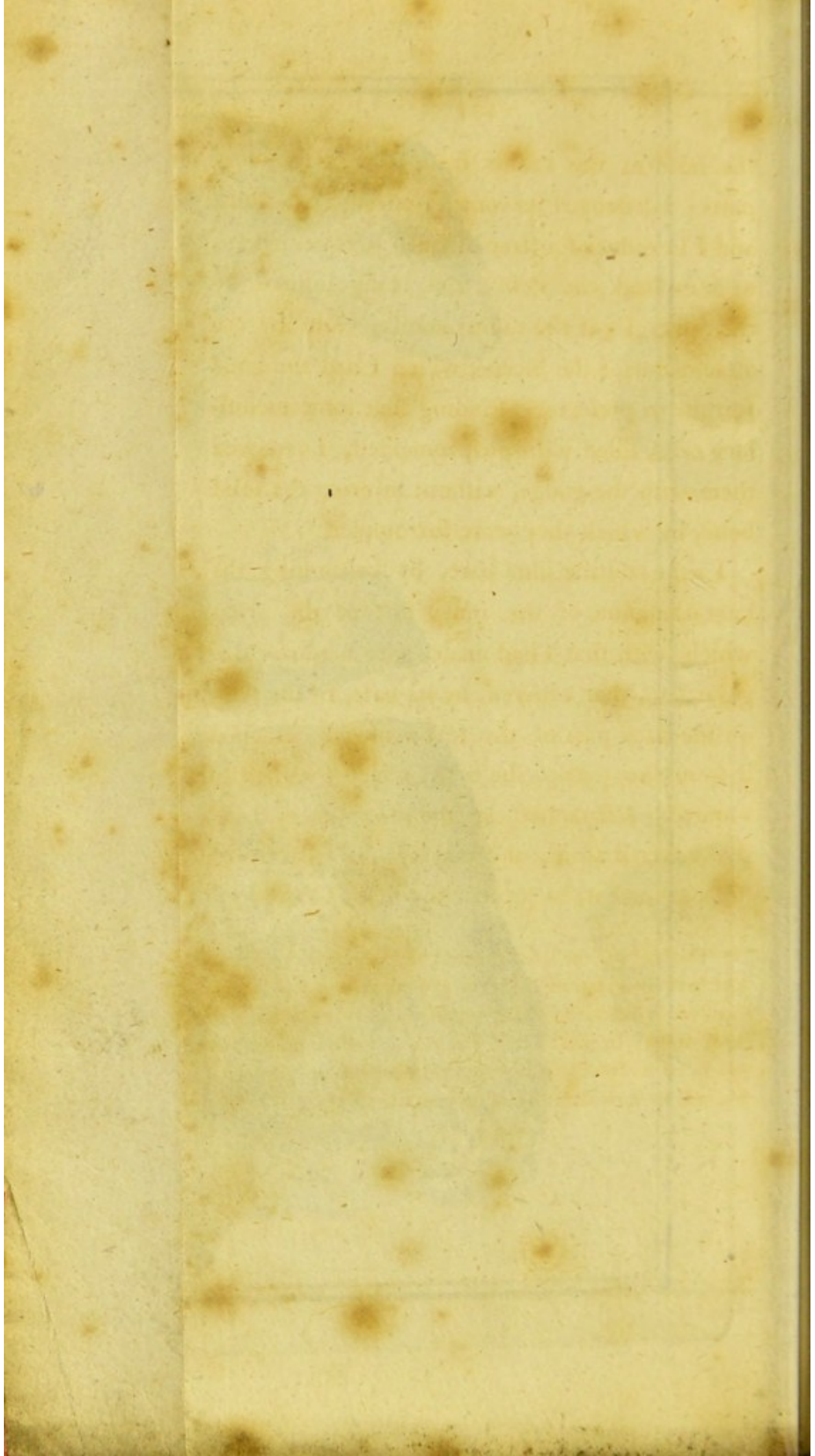


Fig. 1.



the head of the radius from the surrounding parts; I destroyed its connection with the ulna; and I introduced a strap of linen between them, to draw back the flesh from being injured by the saw. I cut the radius across, close by the attachment of the biceps, which I had the good fortune to preserve. Finding that some medullary cells, filled with pus, remained, I removed them with the gouge, without injuring the solid bone, by which they were surrounded*.

I next laid the ulna bare, by continuing the lateral incision of the inner side of the arm; which, with that I had made, gave me a rectangular flap, that adhered, by its base, to the flesh on the back part of the fore-arm. I detached it from that part of the bone, which I wished to remove. I separated the bone from every thing that adhered to it; and having put a strap of linen around it, to protect the flesh, I sawed off

* The bones of the fore-arm must be cut with a small saw: The flesh comes too much in the way of a large saw. The small one is difficult to manage; but what better can we do? And, when you add to this, the risk of cutting the vessels, which, at this place, pass through the interosseous ligament, you will see how difficult this operation must be.

about an inch and a half of the bone, measuring from the tip of the olecranon downwards. The rest of the bone being found, a few medullary cells excepted, I took them away, in the same manner as I had done those of the radius.

It may easily be conceived, that the wound, produced by this operation, was enormous. It will be seen, however, by the sequel, that it healed as soon as if it had been only a common wound. It was washed; the tournequet was slackened; two or three small vessels sprang, which I secured by ligature. I brought the two flaps together, and secured them by two stitches of the interrupted suture. I put in two more, into each of the longitudinal wounds; one into the flap of the arm, and another into that of the fore-arm, on each side*. That done, my patient was carried to bed; where a

* It may be thought, that the stitches would increase the contractility of the flaps, and be torn out. Without entering into the question of futures, which, doubtless, is not yet decided; I have to observe, that, in cases of this kind, the flesh is not so irritable as in simple wounds, where the texture of the parts is not changed. And I can declare, that it is impossible to do without them, as any person will find, who attempts the operation.

cushion of chaff, covered with several folds of cloth, and an eighteen-tailed bandage, were placed. On this the arm was laid, in a half-bent posture; and I covered the wounds with pledgets, dipped in a mixture of olive oil and yolks of eggs, in order to prevent the caddis from adhering, which renders the first dressing so painful. Over these pledgets, caddis was laid; and the whole was secured by compresses and a bandage. The weight of the bed-clothes was borne up by a hoop.

The first day passed, calmly enough. In the evening, the pulse rose; an anodyne was given, and barley-water with milk was allowed for drink. The night was passed without sleep, though without pain; but the thirst was great.

Next day, there was some fever; the skin, however, was natural. The dressings having become wet, with bloody and thin foetid matter, I resolved to remove them. The lips of the wound were beginning to inflame; similar dressings were applied. The night between the second and third day was good, with a little sleep.

On the third day there was fever, but, in other respects, the patient was easy. In the morning, the dressings were wet as before; they were removed, and the wound was dressed as on the two preceding days. During the night between the third and fourth day, the patient slept five hours, though nothing but barley-water with milk had been given.

During the night between the fourth and fifth day, a slight hæmorrhagy took place, and the inflammation had increased.

On the fifth day, the thin matter discharged was copious and foetid, and the wound was florid.

On the sixth day, the matter discharged was whitish.

The seventh was better than all the former days. The inflammation had subsided; the matter discharged was good; the pulse was natural, and the appetite and sleep as good as could be wished.

From this detail, it appears, that on the seventh day, this wound, which, from its size, might have made any one, not accustomed to

such operations, afraid of some dangerous event, was nothing more than a simple wound, discharging good pus. This will not be surprising, if we keep out of view every idea respecting a wounded joint; and contemplate nothing, in this case, but a division of soft and hard parts, the cure of which, as in amputation, goes on with a rapidity that is astonishing.

From the seventh to the fourteenth day, things went on better and better. Nothing unfavourable occurred, during this long period; the discharge decreased; the flesh began to granulate; the transverse wound healed; the longitudinal wound on the inner side, except about an inch at its lower end, was healed also. The cure of the external longitudinal wound was not quite so far advanced. It had a communication with the centre of the fore, by a shallow sinus. No pieces of bone, nor any scales, at least none that could be seen, were discharged.

The patient wanted to get out of bed, which I permitted. He was put into an arm chair; and the arm was placed, as it had been in bed, by means of a little table made on purpose. In

fifteen days, he found himself so stout, that I had a case made for him, like that described by BELL, for fractures of the cavicle. In this I placed the arm, and he could go where he pleased.

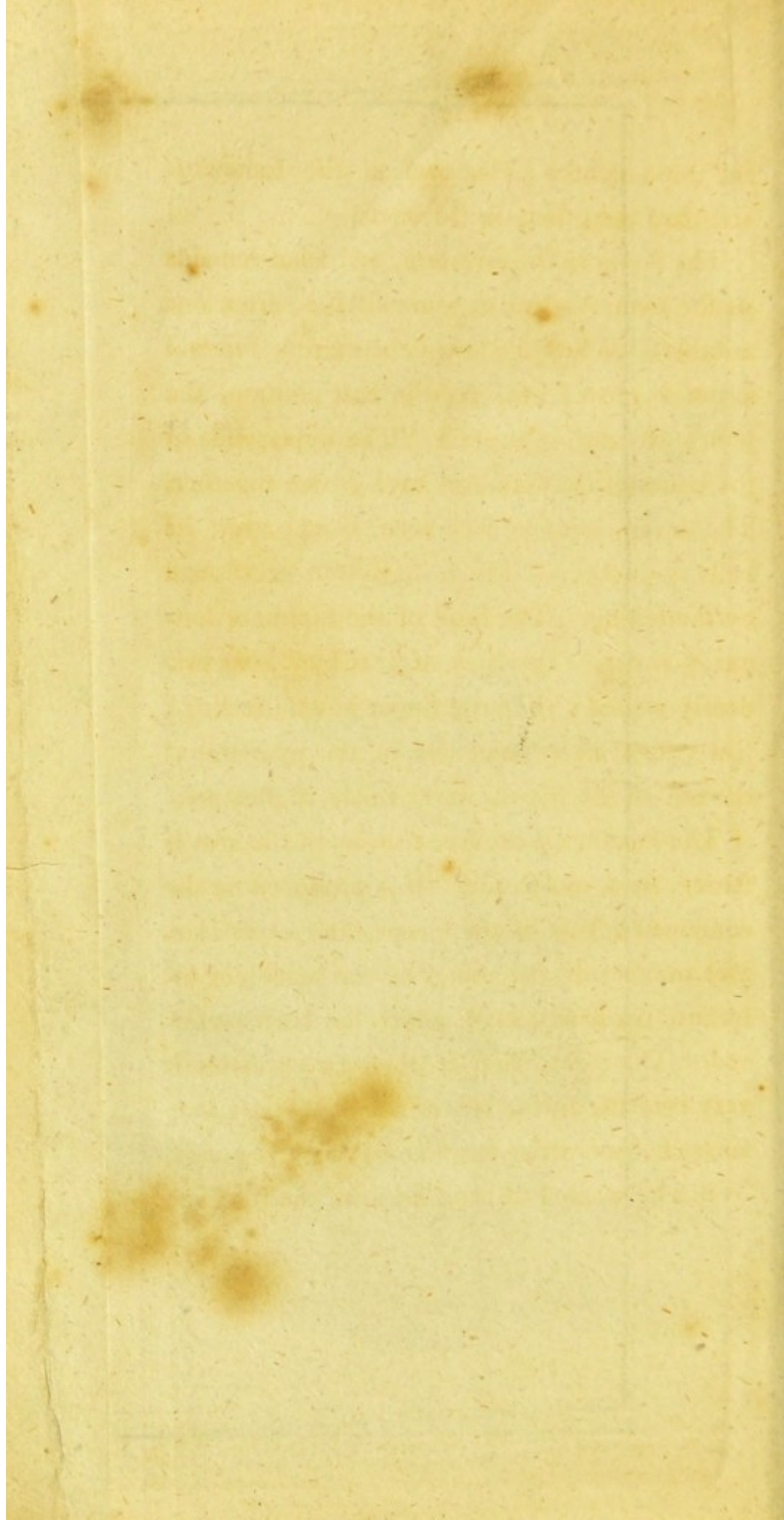
Things continuing to do well, all the wounds being cicatrized, except at a few points, where the old cicatrix had opened again, I sent the young man home, carrying his arm in the case-fling, which, however, in a short time, he laid aside.

At first, this arm was powerless; but, by degrees, it gained strength. I did not see the lad for a long time; and I cannot describe the progress of his recovery, which, it need not be doubted, was slow.

In the year 1801, I had an opportunity of examining this arm. Its external appearance was like the drawing in Plate II. which is a representation of the outer side of the arm. Its length, measured from the acromion, along the outer side, to the extremity of the thumb, compared with the length of the other arm, is less

PLATE II.





by three inches. The arm is also somewhat less than the other, in thickness.

The bones of the fore-arm, and what remains of the humerus, are at some distance from one another. When the arm is bent, this interval is not so great; but, even in that position, the bones are not in contact. The upper ends of the bones of the fore-arm have grown together. The biceps muscle has been spared; but its belly is thickened, which has been occasioned by shortening. The head of the supinator longus is entire. The back of the hand has evidently wasted; the little finger has no feeling; (the cubital nerve was cut in the operation;) the rest of the fingers move freely, at pleasure.

The flexion of the fore-arm upon the arm is strong, firm, and steady. It is produced by the combined action of the biceps, and a considerable number of the fibres of the brachii internus, the insertion of which has been preserved. The contraction of these two muscles is very evident, during this action. It was a long time before this movement was regained. When he wanted to bend the arm, the fore-arm

hook, and fell in towards the inner side ; but he has got the better of that of late, and now this motion is free and correct.

The extension is neither so free nor so firm, nor to the same extent. It seems to be produced by the action of some of the fibres of the triceps extensor ; the body of which, however, is very much wasted, which has occasioned a hollow at the inferior and posterior part of the arm.

The pronation and supination are not what they were. He can perform them ; but the bones of the fore-arm, having grown together at the upper end, both turn at the same time. The flesh, which fills up the space between the bones of the arm and fore-arm, yields, as it were, by twisting. The motion is extensive. It cannot, certainly, be occasioned by the pronators, because the radius adheres to the ulna. What, then, can the muscular force, by which this motion is produced, be ?

I must not forget to state, that this man has now the use of his arm, so completely, that he

uses it in thrashing in the barn, holding the plough, &c.

If these things seem to be incredible, they may be easily brought to the test of experiment. I am firmly of opinion, that, in similar circumstances, the issue will be the same. I have only to add, that the man is still alive; so are all the patients, the history of whose cases follow. So are many others, on whom the operation has been performed, in the army, either in the presence of M. PERCY, or by himself; in which operations, the results have varied, in proportion to the degree of injury done by the shot. I am authorized here to say, that this able surgeon avows, with grateful pleasure, that it was my father, who was one of his best friends, that inspired him with that happy boldness, which, it is true, he had previously shewn, in cutting out the head of the os humeri, but which, but for my father, he would not, perhaps, have ventured to carry so far, as to attempt the removal of the elbow joint.

C A S E II.

A man of the name of MORIOT, a Chasseur in the 1st company of the Centre Legion, was dismissed from the military hospital of Bar-sur-Ornain, upon the 29th of August 1794. There were several ulcers near the elbow of his right arm, which were the consequences of a gunshot wound.

This foldier had undergone many operations, in different hospitals, without any relief. The arm was very much swelled, and so very painful, that he scarcely could allow it to be touched. The matter discharged was sanious, and stained the dressings. He seemed, every day, to be getting worse and worse.

My father, having satisfied himself that a caries did exist, resolved on the operation, which he performed in the following way.

Having seated the patient on a chair, and caused his arm to be supported by assistants, he made two longitudinal incisions, one on each side of the arm, along the spinous edges of the os humeri. These incisions were begun, about

two inches and a half above the condyles; and were continued downwards, till they reached below the condyles, penetrating to the bone. He then made a third incision, above the olecranon. This incision, passing directly across, from the one lateral incision to the other, produced a square flap, which he raised from the bone, and made be held up by an assistant. He cut the ligaments of the joint; and, dislocating the os humeri, he detached it from its muscular adhesions, for about an inch downwards; and at that place he cut it through, because it was completely carious. The rest of the bone being sound, he contented himself with removing, by the chissel, a few spots that were carious on its posterior surface.

He next proceeded to make a new flap, in order to lay bare the upper end of the bones of the fore-arm, which also were carious; and, to effect this, he made one incision along the external edge of the radius, and another along the internal edge of the ulna, each about an inch in length, and in the direction of the longitudinal incisions formerly made, beginning where

these ended. Having thus got another flap, he separated it from the bones, which were found to be much diseased. Having detached the bones from their adhesions, he cut off, from each of them, about an inch with the saw.

The patient was put to bed. His arm, half bent, was laid on a cushion, on which an eighteen-tailed bandage had been previously placed.

My father intended to have brought the flaps together by future, but the following circumstance put that out of his power. The patient, in the hope of rendering himself less sensible of pain, had drank a whole bottle of white champagne before the operation. As the man was not drunk, my father imputed the singularity of his manner to fear. But, upon the first incision, the blood issued in such profusion, that they were obliged to tighten the tournequet. This did not stop the bleeding; so that it was judged proper to fill the wound with caddis, gently crammed in. By this means, the bleeding was checked at last, but the lips of the wound could not be brought together.

In a few minutes after the dressings had been

applied, the patient fell into convulsions, and became delirious. The novelty of these symptoms made my father suspect the cause.

On the third day, all the caddis was removed. The flaps had become retracted, inflamed, and so painful, that it was impossible to attempt futures. A trial was made with straps, so disposed, as to have in some degree the effect of the uniting bandage. For twenty days, these did very little good; but, after that time, they assisted considerably in bringing the flaps together; the tumefaction of which began gradually to subside; granulation took place, and the wound cicatrized. But this was not accomplished in less than six months, nor without a great deal of trouble.

Seven months after the operation, this patient was sent home, completely cured. The arm, fore-arm, and the hand, were perfectly found. About two years after he left the hospital, he made his appearance at Bar. The cure remained complete, and the flexion of the fore-arm on the arm was very distinct.

C A S E III.

A sergeant, of the name of MARQUOISE, in the 3d battalion of the Meuse, was sent to the military hospital at Bar-sur-Ornain, for an ulcer upon the external condyle of the os humeri of the right arm, the effect of a gun-shot wound.

My father, having ascertained that the bone was carious, persuaded the man to submit to an operation.

After placing him, as he had done the other patient, he made a longitudinal incision, from the inferior part of the external condyle upward, for about two inches. From the inferior end of this incision, he carried another across, which cut nearly the external half of the tendon of the triceps. He thus got a flap that was triangular, which he raised from the bone; and having brought the whole of the caries into view, he removed, by the gouge, the external condyle; a plate of about four inches in thickness and an inch in length, from the hard substance of the bone; together with part of the olecranon, with the bullet sticking in it.

The flap was laid down, and secured by two stitches.

In six weeks, the patient was perfectly cured, without any unpleasant occurrence. Three months thereafter, he joined his regiment, in which he continued to do duty for several years. At present, he is living at home, where he works at his trade as a shoemaker; and the only remain of his former complaint, of which he is sensible, is a difficulty of extending his arm completely.

My father cut out several other elbow joints; among which may be mentioned, that of Mademoiselle CELLIER at Bar-sur-Ornain, and that of Mademoiselle ROUYER at St Michael; both of whom can now use their arms very well *.

I may even add, without the fear of being accused of vanity or presumption, sentiments, which are as much strangers to my breast, as they were to that of my father, that both he and I have so uniformly succeeded in these operations, that our town has become, in some sort, the re-

* The history of these cases has not been preserved; therefore, I can only mention them.

fuge of the unfortunate, afflicted with carious joints, after they have tried all the means usually recommended by professional men, or have had recourse to empirical nostrums, and when amputation seemed to be their last resource, which sometimes their surgeons have been unwilling to perform, afraid lest some unknown cause, some latent virus, might render the operation fruitless.

GENERAL OBSERVATIONS.

The cases which I have related clearly shew, that surgery possesses means, the most sure, for the cure of caries in the elbow joint. The success which we have met with, will lead, I am persuaded, to the rejection of amputation, in all cases of the kind. It would give me the most sincere pleasure, if it were in my power to say, how far this method of management may be applicable to the many other severe complaints, with which this joint is occasionally affected. But, as I have no cases of such affections to bring forward, I could only reason

from analogy ; which any other person may do, equally well with me.

“ The excision of the carious extremities of
 “ bones cannot be advised,” says M. BOYER *,
 “ in cases of white or lymphatic swellings, ex-
 “ cept the affection be confined to the articu-
 “ lating cavities, and does not extend far among
 “ the soft parts that surround the joint. If, for
 “ example, the cellular substance and the liga-
 “ ments, which are about the knee, be loaded
 “ with lymph, and be so changed in structure,
 “ as to have become a homogeneous and lard-
 “ like mass, the extirpation of the joint, as pro-
 “ posed by PARK, would obviously be imprac-
 “ ticable. This bold operation can only be
 “ done, when the bones alone are affected.”

This opinion has, without doubt, been taken up from a conviction, that, in an operation, which it would be cruel to perform without mature deliberation, nothing ought to be left to chance. I am thoroughly persuaded, that, when the flesh is so far changed, as to form,

* Leçons sur les Maladies des Os, publiées par A. Riche-
 rand, tom. ii. p. 224.

with the ligaments, one *homogeneous and lard-like tissue*, the operation cannot possibly succeed. But is the bone, in any case of the kind, alone affected? In the preceding cases, the flesh was found to be very much diseased, ulcerated, thickened, hard, and, in some places, changed into a lardaceous mass; nevertheless, the operation did succeed. If this state of the soft parts depend on the disease in the bone, one should think, that, by removing the cause, all would get well. This is, in fact, what happened. I aver, with confidence, that this change takes place in a very short time. My father was so much convinced of it, that, provided the flesh was only alive, he did not hesitate to operate. Mr PARK is nearly of the same opinion; for, in the case of the knee joint, which he cured, he says, "the teguments were so stretched, that it seemed scarcely possible they could allow of farther distention."

This truth, I consider as most important. My father saw it only by degrees; for, at first, as may be seen in the case of the shoulder joint, he believed, that it was absolutely necessary to

remove the lardaceous cellular substance. There must be, without doubt, a point at which we should stop; but my experience does not enable me to say, where that point may be.

The experiments of M. CHAUSSIER, on the hinge-like joints of animals, seem to weaken the facts which I have stated. That the difference between these experiments and my cases may be seen, I shall quote the experiments here. In my opinion, we should avoid all reasonings, founded on analogy alone.

“ * M. CHAUSSIER made the same experi-
 “ ment on the inferior extremity of the thigh
 “ bone, that he had made on the lower end of
 “ the bone of the arm, and on the lower end of
 “ the tibia. He even cut out, according to Mr
 “ PARK’s method, the whole of the elbow and
 “ knee joints; but, though none of the animals,
 “ on which he made these experiments, died,
 “ the operations were always fruitless. The
 “ flesh, as well as the bones that had been cut,
 “ healed perfectly well; but, in place of a new

* Mémoires de la Société Médicale d’Emulation, troisième année.

“joint being formed, the extremities of the
 “bones continued at a distance from one ano-
 “ther; and the whole, below the joint, re-
 “mained a mere pendulous mass, totally useless
 “to the animals in their movements. Besides,
 “these operations on the ginglymoid joints are
 “very difficult, and very dangerous, on account
 “of the ramifications of the blood vessels; and
 “can afford no hope of success, because the
 “joints are not surrounded and covered with a
 “sufficient quantity of flesh.”

The motion of the fore-arm upon the arm,
 in so far, at least, as flexion and extension are
 concerned, have been recovered, in all the cases
 of which I have given an account; and this
 seems to have been owing to the care that was
 taken to preserve the radial attachment of the
 biceps, and the ulnar attachment of the bra-
 chieus internus; or, at least, by the preservation
 of one or other of the two; without which, I
 believe, what the learned professor found to
 happen, as I have stated, in his experiments,
 would have taken place—the motion of the
 hand only would have remained; a reason suf-

ficient, however, for performing the operation.

My father, in the memoir on the excision of carious joints, which he presented to the academy of surgery in 1782, was of opinion, that the operation at the elbow would end in a stiff joint, or that the bones would ankylose; and he proposed placing the arm of the patient in that position, which would render it, from its shape, most useful after they united. Hitherto, the bones have grown together after the operation at the knee joint; but things do not go on in the same way as has been already stated, at the joint of the elbow. When the whole of the joint is cut out, there always remains a space, very perceptible, between the two bones of the fore-arm and the bone of the arm. This is confirmed, by what has uniformly taken place, in the operations performed on those who were wounded, in the army of the Rhine. The same was the case with the animals on which M. CHAUSSIER performed his experiments; except that ankylosis did not take place, at the knee. There is reason to believe, that this difference arose from difference of posture.

I know nothing, as yet, of what goes on at the extremities of the bones, during the cure. Before any opinion can be formed on the subject, an opportunity must occur, for dissecting some of the limbs that have been cured by this operation. Mr PARK thought that the bones would be lengthened, by the new growth of callus; but, the first Case which I have stated, shewed, that the limb was shortened three inches: so that, if there had been any lengthening of the bones by callus, it could not be very great. It will be seen, that nearly the same thing took place in the operation at the knee joint, which is to follow.

“In the arm *,” says Mr PARK, “the advantages arising from the preservation of a hand and fingers, with all their original motions, except those of pronation and supination, were so very evident, and so very considerable, independent of the motions of the elbow, or of any considerations respecting the length of the arm, as not to leave room for a moment’s hesitation.”

* See page 12 of the present edition.

Mr PARK was indebted to his imagination, for this fore-knowledge of the result of an operation which he had never performed. It is surprising, that many of those, who have taken ideas from his book, pretend, in what they say respecting the excision of the elbow, that, after the operation, the limb must be useless. The animals, of which M. CHAUSSIER speaks, require their fore-legs, for standing, walking, &c. It is obvious, that to them, these limbs, after the operation, must, for these purposes, have been useless, and even a burden. But, with regard to man, who makes use of his arms for other purposes, the case is very different. Pronation and supination remain; the motions are new, but the effect is the same. Mr PARK did not expect this.

What M. CHAUSSIER says, respecting the want of flesh, for forming and maintaining the flaps, is just, in so far as the animals, on which he made his experiments, are interested; but it does not apply to man, whose resources are equal to what is wanted. It is true, that the success of the operation depends on getting the

flaps united, as before the operation; and, with that view, we are careful to secure to them a free and plentiful circulation: at the same time, we make them large, that they may allow space sufficient, during the operation, for the removal of what is diseased. All fear, on that point, would be superfluous, since we cut nothing that is of any importance; for, the time of the cure is not in proportion to the size of the wound.

My method of operating differs from my father's, in this, that our patients were not placed in the same position; and, that I sawed the os humeri before I dislocated it. I shall state what led me to do so.

The patient, in my father's first operation, was placed in a chair, and held by assistants; but the writhings of the man were such, that he could not be held steady. This produced a great deal of embarrassment and trouble. Dissatisfied with this posture, I adopted the one I have described, from which I have experienced singular advantage.

If the surgeon, in performing this operation,

try to dislocate the os humeri, he will find, that the two articulating processes of the ulna will give him some trouble. The difficulty is, indeed, almost insurmountable, if the bones be very much enlarged. He will also find, that as the lower end of the os humeri projects forward, it is very difficult to insinuate a sharp instrument, so as to cut, from below upward, the flesh that is attached to its anterior side. These difficulties vanish, when the bone is previously cut above the joint; because, then it can be moved, and drawn towards you, so as to be easily separated from whatever adheres to it, and without any risk of cutting more flesh than we wish. This was the method which my father followed, in operating on the knee and foot, as will be seen hereafter.

I grant, that, by first sawing off the olecranon, as Mr PARK advises, the os humeri can be more easily dislocated. But, in that case, it would be necessary to insinuate the cutting instrument before the ulna; and to carry it, in cutting, from below upwards, which is not an easy matter, and one, of which no opinion

ought to be formed, from operating on the dead subject. If, however, the length of the os humeri to be taken away, be short, it will be necessary to begin by dislocating the bone; and then, if the olecranon be found to be diseased throughout, I am of opinion, that it would be right, previously to saw it too.

I do not think, that it is incumbent on me to bring forward reasons in favour of the practice, which my father and I have adopted. Surgery should be divested of every thing that is not intimately connected with it. Matters of this kind are easily understood. Mr PARK seems to have thought it to be his duty, to give to his method an air of importance. The simple history of the cases themselves, renders any reasonings of mine unnecessary.

Hæmorrhagy is not to be dreaded so much, as might be expected. No large blood-vessel is injured. If any of the collateral or muscular branches bleed so much, as to disturb the operator, they can always be tied immediately, and with ease. But I can say decidedly, that the whole of these vessels cease to bleed, after a

certain quantity of blood is discharged. I never saw my father, in any operation of this kind, stop to tie a vessel. At any rate, the tournequet is always at hand.

I shall finish these remarks, by mentioning, that whoever may wish to repeat these operations, would do well to provide himself with plenty of water and soft sponge. He will need nothing more. He will find, that he must wash away the blood frequently, and wipe the bone, in order to examine its colour.

CHAP. II.

KNEE JOINT.

THE operation, of which I am now to give an account, was never put in practice before, except by Mr PARK. His success shewed, that the most happy effects might be expected from it. The cases, in which my father was concerned, have confirmed that expectation: and now, I believe, this operation, which was looked upon as a chimera, will, in future, be considered not only as tried and established; but, as it enables us to save limbs, which hitherto were doomed to amputation, it will be esteemed as one of the most admirable operations in surgery.

Many surgeons, in other respects expert, will be appalled at the difficulty of performing this operation; but I trust, that when cases become more numerous, they will feel themselves constrained to adopt it in practice. I grant

that amputation is more easy, and a less painful operation; but it is no longer possible to maintain, that after excision, a limb must be useless. The results of the two operations differ from one another in so many important particulars, that no friend to humanity can hesitate which to prefer.

The method which my father followed, in performing this operation, was different from that of Mr PARK, in many respects; for which he has given his reasons, after stating the case. I would advise, that all who wish to consider the subject, should consult the work of the celebrated English surgeon.

CASE IV*.

The son of M. CLAUSE, apothecary at Chalons-sur-Marne, was afflicted, for more than a year, with a swelling of considerable size in his knee. He could assign no cause for it. It had degenerated into several abscesses, which had

* This is one of my father's Cases.—This account of it is also his.

been followed by fistulous ulcers; from which a foetid, purulent matter, was discharged, and through which the probe could be passed into the joint, which was found to be rough and carious. The skin was livid and œdematous; the motion of the joint was lost; and the patient, very much emaciated, could scarcely raise himself to be carried in a long chair, on which his leg lay.

The march of KELLERMANN's army had brought M. PERCY to our town. I took him to see this young man; and, I had the satisfaction to find, that his opinion was the same with mine. He had the goodness to be present at the operation; which was performed in the following manner, on the 17th September 1792. M. CHAMERLAT his colleague, M. GREMIET surgeon major of the regiment of Chasseur cavalry, and several surgeons of the first rank in the army, likewise gave their assistance.

I made a longitudinal incision, between the vasti and the flexors of the leg, down to the bone. These incisions were begun about two inches above the condyles of the femur, and

were carried down, along the sides of the joint, till they reached the tibia. I united them, by a transverse cut, which passed below the patella, penetrating to the bone.

I raised from the condyles, by dissection, the flap which I had thus formed. The patella was attached to it; but, being diseased, I dissected it out. I then caused the limb to be bent, that I might bring the condyles of the femur into view. After having tried them by the gouge, and found that they were diseased throughout, it became necessary to remove them entirely. Wishing to cut them off from the body of the bone, before I turned them out of the joint, I separated what adhered to them behind, where they are joined to the body of the bone. I passed the fore-finger of my left hand through at that place, in order to press back the flesh from the bone; and on that I sawed. Then, causing the knee to be bent, I pulled the cut piece towards me, and separated it easily from the flesh and the ligaments, without any risk.

The condyles of the tibia being found to be carious, it was necessary that they should be

laid bare. In order to do this, I made an incision, nearly 18 lines in length, on the spine of the tibia. I extended my former lateral incision on the outer side the knee, nearly as far down upon the head of the fibula. By these means, I obtained one flap, that adhered to the flesh, which filled up exteriorly the interosseous space; and another triangular flap, formed by the skin, which covers the inner face of the tibia; which bone I was obliged to lay bare, before I could apply my saw.

Upon raising the outer flap, the head of the fibula came into view; which, after being separated from its attachments, I cut off with a small saw. I then raised the inner flap, and, separating the condyles of the tibia from the flesh behind, I sawed off from them a piece, about ten lines in length. The rest was found.

I placed the leg in the position in which it ought to be, with respect to the thigh; I laid down the flaps, and brought them together by a few stitches. The wound was dressed with pledgets, dipped in cerate, over which dry caddis was laid. The whole was supported by com-

presses, furrounded by the eighteen-tailed bandage. The patient was laid in bed, in the most easy posture.

During the first day, the pain was considerable. Next day, he was more easy. I thought it right to renew the dressings, and I applied a machine for keeping the limb in its proper situation.

This machine was composed of a board, the length of the diseased limb. It was bevelled at the upper end, that it might not hurt the thigh; and scooped out before, that it might receive the heel. It terminated in a sole; and, at the sides, it had ledges of wood, which slipped easily into grooves; and as these ledges rose higher than the dressings, there was no need of a basket to bear up the bed-clothes. I likewise prepared cushions of baked hair, one of which I put between the limb and the under board, and the other two I placed, one on each side, between the limb and the side-boards. The foot rested against the sole, to which it was fixed by a tape.

The dressings now were easy, both to the patient and to me. I had nothing to do but to pull up the ledges, and to take out the lateral cushions. Then the wounds were uncovered; upon which I again applied the caddis, the compresses, and the bandage, moistened with warm water; then I replaced the cushions, and the side-boards. If I wished to change the cushion below, and the eighteen-tailed bandage, nothing was more easy. An assistant raised the limb, without deranging its posture, and I replaced what I had taken away. At last, I raised the limb, and the patient himself changed the cushion.

By means of this apparatus, I got my patient out of bed, on the 3d day after the operation; and I laid him on a low chair. At the end of the 15th day, I placed him in an arm chair, so that the upper end of the plank rested on the arm chair, and the lower end on a chair of the same height. Nothing could be more easy than getting him up, and laying him down again.

It is scarcely possible to conceive, how well things went on with this patient after the ope-

ration. During the first days, he was feverish, restless, and got little sleep. On the 4th, the wound was painful and swollen, and the matter discharged was foetid and copious. On the 7th, he was remarkably easy. The suppuration abated very soon thereafter, and the wounds began to close. In a month, there remained only one opening at each angle of the crural flap, and another at the angle of the flaps of the leg, by which good pus issued from the interior of the wound. The bones had come together, and were consolidated to such a degree, that, when the patient attempted to turn his thigh in bed, the leg turned at the same time.

At the end of the 3d month, the consolidation of the bones was such, that I left the limb at liberty in bed; the patient moved it about at his pleasure. I used the plank, only in getting him out of bed. In short, I flattered myself, that I should be able to make him walk upon crutches, in a month or six weeks; but an event, with which my operation had nothing to do, deprived me of that satisfaction. The Prussians, in retiring from the French territory,

left behind them an epidemic dysentery, which, as is well known, carried off the greater part of those who were seized with it. It got into the military hospital at Bar, of which I had the charge, and was communicated to my patient, whom I dressed every day. He could not bear up against it. On the 15th day, he died, three months and a half after the operation.

This unfortunate accident deprived me of the pleasure of enjoying the fruits of my care; but I remained convinced of the utility of the operation, and persuaded of the propriety and necessity of performing it, in similar cases. I looked on my patient as cured, for I had no relapse to dread.

I expected that the limb would not have been shortened, in proportion to the length of the bones cut off. But I was deceived; the shortening was considerable.

GENERAL REMARKS*.

Before Mr PARK's work was known, I had thought of applying my method of operating, to cases of diseased knee joint. His success confirmed me in my resolution, but did not influence my practice. As this subject is new, and of no mean interest, it is necessary that I should explain the motives which directed my practice.

“An incision was made,” says Mr PARK, “beginning about two inches above the upper end of the patella, and continued about as far below its lower extremity; another, crossing this at right angles, immediately above the patella, the leg being in an extended state, was made through the tendons of the extensor muscles down to the knee.”

This manner of operating appeared to me, to be fraught with inconveniences.—First, There are four flaps, which must embarrass the operator exceedingly:—2dly, The inferior flaps are

* These Remarks are also my father's.

composed of almost nothing but skin ; and, as they are long, I thought they would not be sufficiently nourished ; and it is against this I have endeavoured to guard :—3dly, In cases, where a large portion of the tibia and fibula are to be removed, the difficulty would be great, with the longitudinal incision, which MrPARK makes, upon the spine of the tibia :—4thly, If the end of the tibia be carious, in a few points only, my upper flap alone is enough for me. Mr PARK, in so far as I can see, does not seem to have it thus in his power to stop short.—5thly, The fear which this surgeon manifests, about wounding the capsule, and the precautions he uses to preserve it entire, are altogether visionary ; for, in this operation, the capsule is unworthy of notice :—6thly, His tin case appears to me to be a bad contrivance, because it cannot prevent the leg from altering its position, with regard to the thigh ; and because the limb must be lifted out of it, in order to be dressed. The apparatus which I use has not these inconveniences.

I am so much convinced of the great merit of this author, a few points of whose practice I thus criticise, as to intreat, that these observations may not be considered as intended to lessen the value of his labours. But, having followed a path different from his, I have deemed these reasons, for the difference in our practice, due to those who may wish to follow us.

CHAP. III.

ANKLE JOINT.

IN offering to the public the two following Cases, of Caries of the Ankle Joint, treated successfully by excision, I believe I am the first who has spoken on the subject. My father, in thinking how he should proceed, felt how difficult it was to steer clear of the tendons, the blood-vessels, and the nerves, which surround this joint; but at last he made his mind up, and his attempt was crowned with the most happy success. I should think that his example will be imitated, and that amputation will be reserved for other cases than those of caries in the ankle.

CASE V.

The son of M. LUCOT, inspector of Gendarmerie, met with a sprain in the year 1791, which, by a train of cross accidents, ended in

an extensive caries of the left ankle. In about a year after the sprain had been received, there was a fistulous ulcer on each side of the joint, from which a sanious and foetid pus was discharged; and the probe being introduced through the openings, the articulating surface of the tibia, as well as that of the fibula, and the body of the astragalus, were felt to be bare. The foot, and lower part of the leg, were swelled. There was a dull pain in the diseased part, and the patient could not lean his weight on the limb.

Amputation, most certainly, was the only hope for relief, which surgery could afford. But my father thought, that the case was one which came within the range of his mode of practice; and, on the 15th of April 1792, he performed the operation, in the following way.

He made a longitudinal incision, beginning at the inferior and posterior part of the maleolus internus, continuing it upwards, from three to four inches. He then made another incision, transverse, which extended from the inferior end of the former incision, to the edge of the tendon of the peroneus brevis.

He made another longitudinal incision, on the inside, which began at the inferior and posterior part of the maleolus (internus), and extended from three to four inches along the internal border of the tibia. Then, by a third incision, which began at the lower end of this, he cut the skin transversely, till he came to the tendon of the tibialis anticus.

He disengaged the fibula from the tendons, the ligaments, and, in general, from every thing by which, at its inferior extremity, it is held in its situation. He passed the handle of a scalpel under it, and, with a chisel, he cut it across, above the ankle. Perceiving that the bone was affected, still higher up, he took away six lines more.

Wishing to cut the tibia above the maleolus, before he turned it out of the joint, he separated every thing that adhered to it; and then, passing the handle of his scalpel between the posterior surface of the bone and the flesh which had been detached from it, he introduced, between the spine of the bone and the flesh before the bone, the blade of a narrow saw,

fixed in a handle; and cut the bone, sawing from before backward, which was a work of no small trouble. That being done, he turned the foot outward, and, making the piece of bone which he had cut off project, he detached it from the tarsus without difficulty.

The astragalus being diseased, he removed the whole of its articulating surface, and a great part of its body, till he came down to what was found.

The foot was placed in the most natural position, with regard to the leg; the flaps were brought together, and secured by a sitch at each of their points; the wounds were covered with lint, dipped in cerate; and the whole was surrounded by compresses and the eighteen-tailed bandage.

To keep the foot steady, he got two pieces of tin-plate, and, placing one on each side of the leg and foot, he stuffed them with hair cushions, and bound the whole to the limb, by tapes that tied before. The foot rested against a sole plate, fixed to the side plates; and a hoop, placed over all, bore up the blankets.

When he dressed this wound, he made two assistants support the knee and the foot. He then removed the sole plate, the side plates, and the bandages; applied new caddis to the wound, and replaced the apparatus.

The patient was put on a low diet, for some days, after the operation. His drink was barley-water with milk. He was feverish for five days. The discharge was, at first, profuse and foetid; but, in a short time, it began to diminish, and to become better.

In six weeks, the wounds were contracted to the eighth of their original size; and the union of the foot to the leg had proceeded so far, that it was not necessary to support it during the dressing. The use of the tin plates, however, was continued.

At the end of three months, the progress of the cure was retarded by an abscess, which was treated with emollient cataplasms; but six weeks elapsed before it was healed: and very soon thereafter, a dartarous eruption followed, which was also got cured.

These two unlucky occurrences prevented the

patient from being able to lean his weight upon the foot, till the 6th month. During the 7th, he used crutches. In the 8th month, he could walk with a stick; and by the end of the 9th, he walked without any assistance whatever, and in such a way, that he could do what he pleased.

This leg is not precisely like the other. There is a very evident want, at the outer ankle. There was a swelling, for a considerable time, on the inner side, immediately over the junction of the foot to the leg. This, however, gradually diminished, and at last went away. The foot is drawn up to the leg; so that the limb is, upon the whole, about an inch shorter than it was. A new joint, between the tibia and astragalus, has not been formed; but the astragalus has acquired a degree of motion on the os naviculare, the os calcis on the os cuboides, and the other bones of the tarsus have acquired a motion upon one another, that is wonderful, and makes up, in a great measure, for the motion of the ankle joint, which is lost; so that, with a high-heel'd shoe, this man now walks without halting.

The limb was examined, some months after the operation, by M. PERCY and CHAMERLAT; who could not help expressing their astonishment, at a cure that had been so speedy, and a result so surprising.

CASE VI.

LEWIS MEUNIER was affected, when young, and without any known cause, with a caries in the left ankle joint. To say that all the topical applications, which are held in esteem by the weak minded, had been tried, would be only repeating a remark that might be applied to all the cases which I am relating; for the sick cannot brook the idea of an operation, till they find that nothing else can be done.

I was consulted in the year 1796. The patient was 17 years of age, of a delicate constitution, but otherwise in good health. There had been glandular ulcers, when he was 14 years of age, in the arm-pit and groin, of which nothing now remained but the remembrance. The diseased joint was very much swelled; the

skin was ædematous and livid ; the leg was very much emaciated, and bore the scars of ulcers, long ago healed.

The ankle was considerably enlarged ; he had lost the power of moving the joint. The bones of the tarsus, also, were immovable ; so that, in walking, he was obliged to bring the foot round with a sweep. There were two ulcers on the inner side, which gave vent to the matter of two sinuses. Through the anterior opening, the probe could be passed, along the inner side of the astragalus ; and, by the posterior, it passed along the same bone backward, into a cavity, the bottom of which could not be felt, on account of its crooked direction, and the pain which the patient felt there from the probe. The discharge was a sanious ichor, which tinged the linen with a black stain.

It was determined that the diseased bones should be cut out, and I performed the operation in the following way.

I made a transverse incision, below the malleolus internus, which extended from its posterior edge to the junction of the astragalus with

the os naviculare. I carried another incision from the anterior end of this incision, for about an inch, directly towards the sole of the foot. Then I led a third from its posterior end, towards the os calcis, directing my scalpel so as to avoid the arteries which pass along the surface of that bone.

I raised the flap, by dissecting it from what it covered, and saw that the astragalus required to be removed. I took off a little from it with the gouge; but finding the maleolus internus to be in my way, I was obliged to go to the tibia.

I made a longitudinal incision, of about two inches in length, upon the anterior edge of this bone: it joined the transverse wound below. I got, by these means, a triangular flap, which was connected to the flesh, on the posterior side of the tibia; and I had it in my power to preserve the tendons, which pass along behind that bone. I raised this flap by dissection. The whole of the lower end of the tibia was carious. Finding it impossible, on account of the fibula, so to insulate the tibia as to get the saw applied,

I was obliged to pare away all that part of it which was diseased, with the gouge, which involved me in a good deal of trouble.

In this way, I got at last about an inch and a half of the bone removed. Above that, the solid part of the bone was found. But this was far from being the case with the cancelli, which were so much diseased, that I was obliged to introduce the gouge, and take away about two inches of them *.

This being done, I took away the remainder of the astragalus. The other bones of the tarsus being found, I did not touch them. At last, I laid down the flaps, and secured them by stitches.

The patient was put to bed, with his foot laid on its outer edge, and resting on a pillow of chaff, on which a cloth had been previously laid. The wounds were covered with pledgets,

* Perhaps it will be thought, that when these cells are destroyed, the bony cylinder that covered them would die; but that is not the case. If we were deprived of this resource, the quantity of bone to be taken away would sometimes be so enormous, that the operation ought not to be attempted.

dipt in cerate; over which, dry caddis was laid; and the whole was surrounded with compresses and the eighteen-tail'd bandage.

During the two first days, the wound discharged a great deal of bloody sanies; the patient was feverish and restless. In a few days, he became quite easy, and the suppuration came on more kindly.

I intended to make my patient lie in bed, till I thought the tibia was sufficiently firm to bear his weight. Then, by giving him crutches, I thought I should be able, by gentle and gradual exercise, to get him the length of leaning his weight upon the heel; but he was young, and, at the end of six weeks, finding himself strong, I could no longer restrain him. He got up, took his crutches, and ran recklessly wherever he pleased. The completion of the cure was retarded; the wounds were a long time in healing; the fibula, having no assistance from the tibia, in sustaining the weight which it was obliged to support, sunk down upon the external side of the foot, which was thrown in-

wards * ; so that this lad rests now on the outside of his foot : that, however, does not prevent him from walking. For a long time, he needed crutches ; at last, he has been able to do without them.

There is now no joint at the ankle ; but the bones of the tarsus do the duty of the ankle joint, as in the preceding case.

The inferior extremity of the tibia is in part regenerated. You can feel, in the place where the void was, bone that is very solid, and of the shape of the tibia.

In performing this operation, I allowed the inferior extremity of the fibula to remain ; thinking, that nature, by reproducing that portion of the tibia which I took away, would finally give, by both bones, a solid support to the patient. I founded this expectation on my father's experience, in the case in which he met with the reproduction of a great part of the tibia, that had been removed, the fibula being left entire.

* I had caused plates to be made, as in the former case ; but the patient would not put them on, except when in bed, and that without my knowledge.

But whether the imprudence of my patient was to be blamed, or that my expectations were too sanguine, the event, as I have stated, was not what I expected. In a similar case now, I would determine to cut off as much from the fibula as from the tibia. The shortening would be greater, but the cure would be effected more easily, and in a shorter time.

The two cases which I have stated, shew, that the difficulty of laying the bones bare enough, so as to get them easily sawed, renders the excision of the ankle joint a very troublesome operation.

The tendons, the vessels, and the nerves, which surround this joint, must be preserved; and to do this, great care must be taken in making the transverse incision; the consequence of which is, that the wound being small, patience and caution are necessary in sawing the bone.

As the flaps of the leg can be formed of skin only, they should be small; and care should be taken to preserve their intercourse, both with the flesh before and behind the joint.

This operation is, perhaps, the most difficult

of all those I have described. The case I have related is not so interesting as that by my father. I, indeed, have accomplished a cure ; but the functions of the limb are not so completely recovered. From what I have stated, it will be seen, that I think I have discovered the cause of the failure. As this method of operating is new, I have ventured to indulge the hope, that what I have stated will help, in some degree, to lead to a more general practice.

The wounds, which are the effects of the operations I have described, heal surprisingly fast at the beginning ; but, during the progress of the cure, small sinuses or ulcers remain, which, continuing to discharge a ferous pus, are tedious in their cure. They are sometimes kept from healing, by little scales, which produce suppurations, and are discharged from time to time, when least expected. But, notwithstanding all these things, nature makes the cure complete ; so that they scarcely deserve to be farther noticed. We judge our patients cured, when they have got so far ; and, in fact, these secondary ulcers, after a shorter or a longer time, heal up, and never open more.

CHAP. IV.

TARSAL JOINT.

CARIES of the Tarsal Bones is very frequent. Their spongy texture, and the closeness of their articulations, are perhaps the causes of the rapidity with which caries spreads among them. The consequence is, that surgeons are frequently obliged to remove them.

These operations are not very difficult; the bones are easily laid bare, and the flaps have sufficient nourishment. The chief difficulty lies in dislocating the bones which we want to remove. The hold that can be got of them is so trifling, their articulating surfaces are so numerous, and their joinings so close, that it is frequently very difficult to get them disjointed. Be that, however, as it may, the event is always pleasing; the cure goes on rapidly; in a short time, the patient is able to use his limb, as if nothing had been lost; he halts for a few

months; but, in the end, he walks without limping.

Caries of the heel bone is by no means so promising. If its inferior surface be cut away, the heel can no longer support the weight of the body; and the patient is obliged to lean, thereafter, on the anterior part of the sole of the foot, till he accustom himself to use a high-heel'd shoe. If the case be such, that the tendo Achilles must be destroyed, it would be better to amputate the limb. I have performed this operation, once only. I scooped out the whole inferior surface of the os calcis; I preserved the insertion of the tendo Achilles. The power of motion has been recovered, as I have stated, and a cure has been effected.

The bones of the metatarsus frequently become carious. In general, the disease is produced in them, from their connection with the tarsal bones. If the root, or upper end only, of a metatarsal bone, be affected, the diseased part may be cut out, and the sound part may be allowed to remain; but, if the anterior part, or if the whole of the bone, be diseased, it

should be taken away ; and, as the corresponding toe would then have little or no support, it would, if left, be useless.

The extirpation of these bones is not easy, on account of their articulations with the tarsus and toes. If one of the bones only be diseased, there is no need of a flap ; a longitudinal incision, along the upper surface of the foot, is all that is required. The lips of the wound can afterwards be easily brought together, and they will unite readily.

There is a risk of cutting the plantar arch, but that is of no consequence. I have never found it necessary to use a ligature : at any rate, it is easy to suppress the hæmorrhagy. I have performed this operation often, but I neglected to take notes of the cases.

What I have said of the metatarsal bones, may be applied, and does apply, to the bones of the metacarpus.

The bones of the carpus, like those of the tarsus, are often subject to caries. In them, the disease makes rapid progress. Very often, the whole of these little bones, the roots of the

metacarpal bones, and the articulations of the carpal bones with the bones of the fore-arm, are affected, before the surgeon is consulted; and when the disease has advanced so far, nothing but amputation can be recommended.

Caries of the wrist joint admits of excision. I have performed the operation once, and with success. I kept no notes of the case; but I remember, that the patient retained the movements of the fingers, and in part recovered that of the wrist. And here I would remark, that if the end of one of the bones only be cut off, the hand falls to that side. Therefore, it is necessary that both the bones be cut, and at equal lengths, as was observed respecting the ankle joint.

It is proper to take care of the tendons; and, on that account, it is necessary that the joint be laid open at the sides.

I have only one case to state, of the many that have been performed, on account of caries in the bones of the Tarsus. It will give some idea of the general method that should be pursued.

C A S E VII.

In 1788, my father was consulted in the case of the son of M. VARINOT, at Savonnières, in Pertois. Six weeks before that time, this young man had received a blow on the upper part of his foot, from which many disagreeable consequences had resulted; and, at the time my father saw him, the foot and the lower part of the leg were very much swelled. There was an ulcer opposite to the os cuboides, about an inch in diameter, which discharged a sanious pus. There was another between the third and fourth metatarsal bone, produced by an incision made some days before, in opening an abscess. When the probe was introduced, it penetrated into the os cuboides; and the existence of a cavity was ascertained, but its extent could not be known.

The operation being determined upon, my father made an incision on the outside of the foot, beginning about one-third from the upper end of the fifth metatarsal bone, and carrying

it up above the anterior apophyse of the os calcis, passing through the old ulcer already mentioned. The incision formerly made, between the third and fourth metatarsal bones, being large enough, he made a cut across, so as to connect the two. He raised from the bone, the flap which he had thus formed, and made it be held up.

He was obliged to remove the cuboid bone, the third cuneiform bone, the posterior extremity of the fourth metatarsal bone, as likewise the inner side of the root of the fifth metatarsal bone, and, at last, the articulating surface, by which the os calcis is connected with the os cuboides. The tendon of the peroneus longus was spared, and lay bare at the bottom of the wound. He brought down the flap, and secured it by a couple of stitches.

From the 4th to the 8th day, there was a good deal of swelling. On the 5th, the stitches were cut. Between the 9th and the 12th, the swelling and pain abated, a plentiful suppuration came on, and things began to look well. Soon thereafter, the wound at the inner and

lower side of the foot began to heal. That on the outer side continued to discharge a great quantity of purulent matter.

The space, from which the bones had been taken, became filled with a substance, which has become bony. The motion of the foot is completely recovered. The patient walked with crutches at first; at length he threw them aside; and now he walks as well as ever, and the foot is not in the least deformed.

CHAP. V.

SHOULDER JOINT.

I PROMISED to give the case, in which my father cut out the articulating ends of the bones of the Shoulder Joint; which case, he sent to the academy of surgery. In this case, there will be found a method of operating, which is different from what is commonly recommended; but it will be seen, that the mode he here pursued, put it in his power to ascertain the whole extent of the disease. Afterwards, he tried the same method, with the most happy success, in a case of spina ventosa. Every one must see, that too many facts cannot be collected, and brought to bear upon one point, in a matter so essentially necessary to the improvement of surgery. The case was as follows.

C A S E VIII.

On the 15th of June 1786, my father was called to see the wife of M. VIRY, proprietor of the forges at Coufances. She was in her 45th year. She had, for ten months, been affected with a complaint in the left shoulder joint. The shoulder and arm were very much swelled. The fore-arm and hand were œdematous. When any attempt was made to move the joint, she felt the most acute pain. Indeed, she was in constant uneasiness, had lost her appetite, and got little sleep.

Some months previous to the time when my father was consulted, M. BALTHAZARD, surgeon in the town, had, on account of an abscess, made a longitudinal incision, about three inches in length, on the fore-side of the joint.

My father, being of opinion that the joint was carious, persuaded the woman to have the diseased parts removed; which he accomplished, on the 8th of July, in the following manner.

He made a longitudinal incision, on the pos-

terior side of the joint, beginning a few lines below the acromion, from which it extended, three inches downwards. This incision was parallel to, and four inches distant from, the one which had been formerly made. He laid them into one above, by a transverse incision, which cut through the flesh, about six lines below the upper attachment of the deltoid muscle. Thus, a large flap, of about four inches in breadth, and three in length, was produced; which, after being detached from the bone, he folded down on the arm.

He next made two other incisions, one from each end of the transverse incision. The anterior of these pointed towards the outer end of the clavicle, and the posterior towards the spine of the scapula. This gave him a new flap, which he raised; and then he had no difficulty in discovering the whole extent of the caries.

This done, he dislocated the os humeri; and having pushed it up, and ascertained how far down the caries extended, he there sawed the bone across: after which, with the gouge, he rounded the corners of that part of the bone which was left.

He next lowered the arm, and made it be held close to the side; and then, with ease, he removed by the gouge, the whole external angle of the scapula, together with a part of the acromion.

After having taken away as much of the cellular substance, that was filled with hardened lymphatic matter, as he could, he put the patient to bed, and placed the limb in such a position, that the arm formed a right angle with the trunk, the elbow joint being half bent. He brought the flaps together, fixed them by stitches, and covered the wounds with caddis, which he secured by compresses and the eighteen-tail'd bandage.

During the 1st day, the patient was in great pain. The following night, she got a little sleep. For some days, she was feverish. Till the 8th, she was kept on a low diet: then she was allowed something more nourishing. On the 11th, she was permitted to rise for a little. On the 14th, she did not feel much pain when the arm was moved gently; the upper wounds were beginning to unite; the anterior and pos-

terior humeral flaps were discharging pus, both good in kind, and abundant in quantity; and the œdema was disappearing. A small quantity of bark was ordered for a few days, and her bowels were regularly kept open. On the 21st day, the suppuration had nearly subsided, and she could move the arm.

In the month of October following, the cure was retarded by a phlegmonic tumour, which appeared spontaneously on the middle of the arm. It had no communication with the wound, and, in a short time, it healed.

After the cure was complete, a hollowness remained at the top of the shoulder, as in luxations of the humerus, downwards. The upper end of the os humeri rests on the ribs, anterior to the external edge of the scapula. In so far as can be perceived, its size is nearly the same; and it has formed a kind of symphyſis with the surrounding parts, in such a way, that the arm can perform all its motions, except that of elevation, which is very much confined.

IT was my wish to shew, by the evidence of facts, that excision of joints, affected with caries, is, in many cases, a very practicable operation; and one that holds forth advantages so unequivocal, that amputation ought to be proscribed, in every case where excision may be performed.

Experienced surgeons should be my judges. It rests with them to say, whether I have succeeded or not.

THE END.

OBSERVATIONS

BY

JAMES JEFFRAY, M. D.

Professsor of Anatomy and Surgery in the College of Glasgow.

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Professor of Anatomy and Surgery in the College of Glasgow.

TO THE
STUDENTS of ANATOMY and SURGERY
IN THE
UNIVERSITY OF GLASGOW.

GENTLEMEN,

IN reading Mr MOREAU's Work, I began to take notes, which I intended to insert into the Lectures annually given here for your use ; but as I proceeded, the subject became so interesting, that I thought it would be doing you a more essential service, if I translated the book altogether. In doing this, I was forcibly struck with the propriety of Mr MOREAU's advice, that all who read his Cases should consult the work of Mr PARK also. That, however, can be done

by few, as Mr PARK's book is very scarce. Therefore, I have thought it right, with his approbation, to republish his original Letter to Mr POTT; together with the account of his Second Operation, as published in the London Medical Journal. At the same time, he has put it in my power to lay before you, the Result of his later Observations and Practice. In justice to him, it should be stated, that, with modesty that equals his merit, he has anxiously wished that his papers should not precede, but follow the translation of Mr MOREAU's work, as an Appendix. In this, I have unwillingly ventured to differ from him in opinion; for I am certain that you will understand the subject better, if you read the different treatises in the order in which they were published. There are many references in Mr MOREAU's work to, and several criticisms on, Mr PARK's book, respecting which, you would not have been prepared to form an opinion, if you had not been previously acquainted with the work to which the references are made. For the same reasons, Mr PARK's last Communication should have

been placed after Mr MOREAU's treatise ; but unfortunately, by mistake, it has been placed before it. You will not, however, find your time mispent, if, after you have read Mr MOREAU's Cases, you read that Communication again.

Though Mr PARK had shewn, by his success in cutting out the extremities of the bones of the knee, that the Excision of Carious Joints was not only practicable, but safe, which was the great point to be determined, he was far from thinking that the method of operating, which he had followed, was either the best, or the only method that might be devised. In his experiment on the Elbow Joint, you must have seen, that he begun the operation in one way, but, meeting with difficulties that had not been foreseen, he was obliged to finish it in another manner ; and, in the postscript to his letter (p. 45), he mentions a third way, by which, in some few cases, he thinks the end might be better obtained. It was not to be expected, that an operation so novel, so difficult, and, at the same time, so formidable, could be re-

duced to rule, and made perfect, by a few trials. In this point of view, Mr MOREAU's Cafes, which are numerous, and were managed in a way, different, in many respects, from that of Mr PARK, are highly valuable. But, though they were all successful, some of them even beyond expectation, and have thereby had the effect of bringing the operation into practice in France, especially in the armies, I should be sorry if, on that account, you thought that the operation may now be considered as perfect. More cafes, varying in their circumstances and mode of management, may soon be expected; from which I persuade myself it will be seen, that the operation is not only capable of being still farther improved, but that attempts have been made, and with success, to render it more simple and efficacious. In the mean time, permit me to state to you a few circumstances, respecting the cafes with which we are already acquainted, which make me anxiously wish, that you should think for yourselves, before you attempt to perform this operation.

The first circumstance which must, I think,

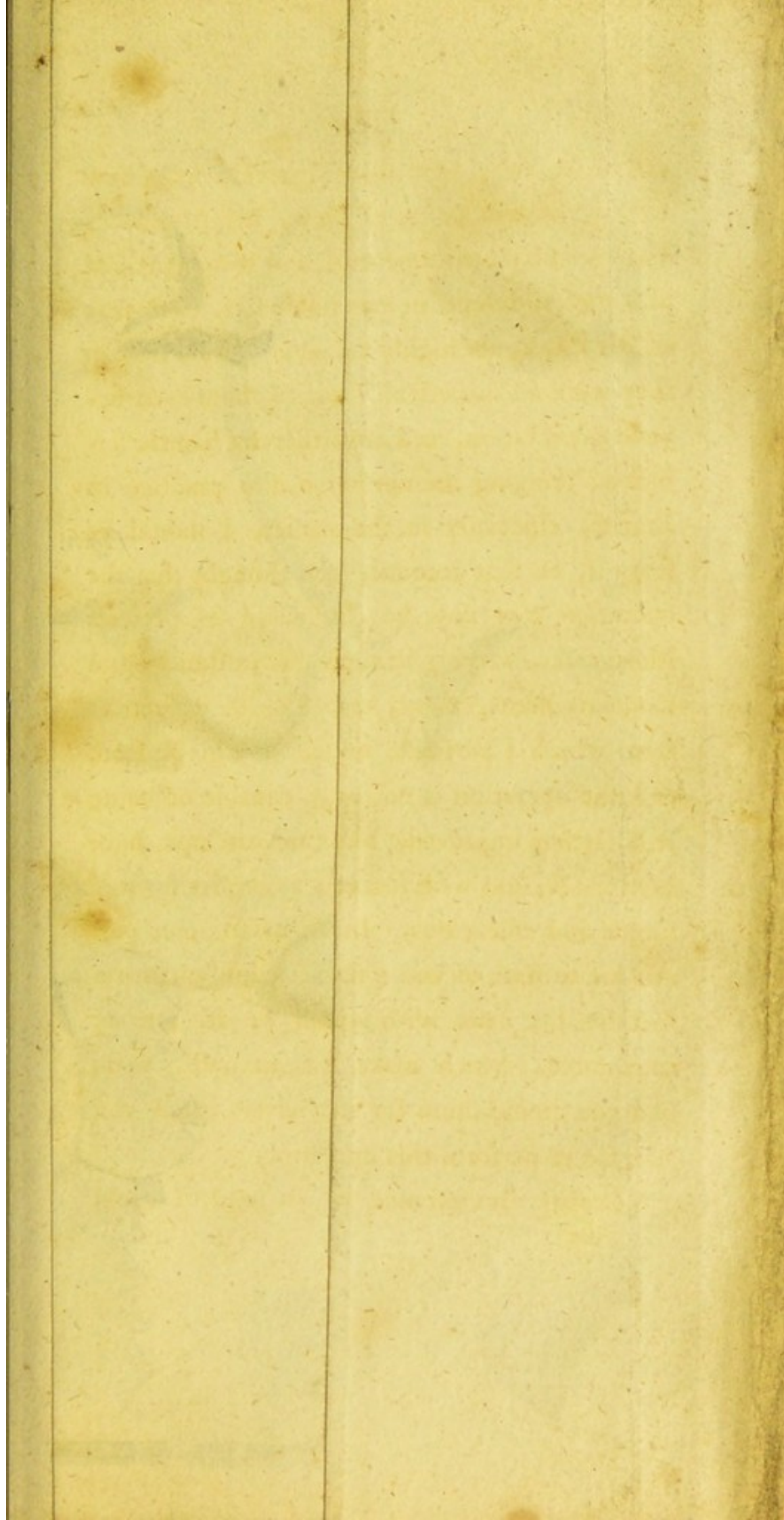


PLATE III.



Drawn by Peter Nicholson.

Hobbs sculp.

have struck you, in reading these treatises, is the difficulty of getting the bones cut, without injuring the soft parts with the saw. Mr PARK, you will see, was obliged to make a crucial incision, and to raise four flaps by dissection, in order to get the flesh drawn back, out of the way of the saw; and Mr MOREAU, in some cases, could not use the saw, from fear of injuring the tendons, the blood vessels, and the nerves; but was obliged to pare away the diseased parts of the bone with a gouge, or to cut them with a chisel.

The common saw, whatever be its size, being straight on its cutting edge, and, on that account, acting in a direct line on every thing that comes in its way, is ill adapted for this operation, when the bones are deep sunk among the flesh. The soft parts, it is true, may be depressed, or they may be drawn aside, or they may be defended by some solid substance, introduced between them and the bone; but the difficulty of doing this in some cases, the impossibility of doing it in others, and the extent of the wound necessary to get it effected in all,

are apparent, and have had no small share in deterring surgeons, in this country at least, from attempting the operation; nor is there much reason to expect, that this operation will, in many cases, supersede amputation, unless some method be fallen upon, to get the diseased bones removed in a more easy, safe, and expeditious manner; for which reason, I am very anxious that this part of the subject should become an object of your serious consideration.

Very soon after Mr PARK's book appeared, I had an opportunity of seeing an attempt made to cut out a piece that was diseased, near the middle of the thigh bone. To do that with the common saw, was next to impossible; for the wound necessary to allow the skin and flesh to be depressed so much on either side of the bone, that the saw could be applied, must have been made to extend almost from the knee to the groin. A saw, therefore, was prepared, of a different kind, to rasp the bone across, without hurting the flesh; but the difficulty that attended the execution of this operation, the time spent in performing it, and the pain which,

notwithstanding all the care that was taken, the patient seemed to suffer, made such an impression on me, that I could not rest from thinking of some method, by which bones might be cut out more easily; and at last I conceived it to be possible, that a saw might be constructed, with joints like the chain of a watch, so as to allow itself to be drawn through behind a bone by a crooked needle, like a thread, and to cut the bone from behind forward, without injuring the soft parts. A drawing of this saw was accordingly made; but it was not till some years thereafter, that I got one executed in London by Mr RICHARDS, who was assisted in making it by his nephew, the present Mr RICHARDS of Brick Lane. In the mean time, a sketch of such a saw was published by Dr JOHN AIKEN of Edinburgh. I do not know that any other saw of the kind has ever been made, except one that I got made lately, of a larger size. The one, of which the Drawing is annexed*, has been used here annually in the Anatomy Class, ever since the year 1790, and has been occa-

* See Plate III.

sionally lent to surgeons, by whom it has been used in operations; but there is no purpose to which it is so well fitted, as that for which it was originally intended, viz. the Excision of Bones from Carious Joints: of course, whenever an opportunity offered here, for shewing the manner in which Mr PARK's operation is directed to be performed, this saw, and the manner of using it, which is extremely simple, has been annually exhibited.

Having brought the bone that is to be cut fairly into view, by incision, the flesh is to be separated from it all around, and by the finger if possible. The needle, which, it is scarcely necessary to say, should be blunt at the point as well as on the edges, at the same time that it should be elastic, and adapted, in curvature and size, to the depth of the wound and the diameter of the bone, should then be taken in the right hand; and, its point being brought to touch the surface of the bone on the right side, should be passed behind, and in contact with the bone, till, sweeping a half circle, it be felt or seen in contact with the bone at the other

side, where it now may be laid hold of, and drawn through. While the surgeon is thus employed in passing the needle behind the bone, his assistant should attend to the saw, by letting it run through between his finger and thumb, so that its cutting edge shall be towards the bone. The saw being brought through, the needle is to be removed, and the handles hooked on. The surgeon should now place himself in a position, to have the full use of all the muscles of his arms; and, having tried the saw gently, to see that its side is not to the bone, he should draw one end of it towards him smartly with one hand, and then the other with the other, till it cut the bone through; during which operation, the assistants should hold one end only of the bone fixed, for, if they press upon both, they will lock the saw, and retard the operation. The execution of the saw will be found to exceed expectation; for, as it is applied round one half of the bone, its cut is extensive. When, however, the bone is sawed nearly through, the surgeon should either keep his hands farther separated from one another

than he found it necessary to do at the beginning; or he should give one handle of the instrument to an assistant, and retain the other himself, that they may stretch out the saw, and thereby make it more like a straight saw, as it approaches the anterior surface of the bone, lest, being then bent too sharp, it break; of which, however, if the force exerted be not unnecessarily great, I can say there will be very little danger, having now used, and sometimes roughly, the same saw for these fifteen years past, without either sharpening or mending.— From the account which I had in my power to give of this instrument to Mr PARK, he was convinced, that in his operations it would have done him essential service; and, on considering attentively the very accurate statements which Mr MOREAU gives, of the difficulties he and his father met with in cutting the bones, there is reason to believe, that it would have been still more useful to them.

The next circumstance to which I would direct your attention, is the difficulty which both Mr PARK and Messrs MOREAU found in

making their incisions, so as to lay the bones bare, that they might be exposed to the action of the saw, and yet spare the attachment of the muscles.

Mr PARK, in his experimental operation on the Elbow Joint, found, that when he made a simple longitudinal incision (p. 7), from about two inches above to the same distance below the point of the olecranon, he could not, after he had raised the integuments, divide the lateral ligaments or dislocate the joint: he was obliged to saw the olecranon off. And, before Mr MOREAU could get the bones sufficiently exposed to the action of the saw, he found it necessary to make two longitudinal incisions, one on each side, beginning some inches above, and carried as far down below the joint; and these he laid into one, by a transverse cut: by which means, he could raise one flap by dissection, and turn it up, and the other he could turn down, whereby the joint was doubtless brought fairly into view; so that the bones could not only be accurately examined, but they were completely exposed to the action of

the saw. You will not fail, however, to observe, that the triceps extensor suffered equally in both cases; so that, to the patient, it could make no great difference, whether the tendon of the triceps was cut across immediately above the olecranon, in Mr MOREAU's way; or whether its attachment was destroyed, by sawing the olecranon off, according to Mr PARK's plan; for in either case, his chance for regaining the power of extending his arm, could be but small. This would be a matter of no moment, if the cut ends of the bones were to grow together; for then the joint would be stiff, and the power of extension, though lost, would not be missed. But though, in all the cases given, both by Mr PARK and Mr MOREAU, it has uniformly happened, that the bones at the knee joint have grown together, and the joint has remained, after the operation, stiff for life; yet MOREAU has shewn, that things do not go on in that way at the elbow. In all the cases, of which he gives an account, the patients recovered the power of bending that joint.

In Case III. (p. 114), the greater part of the bones of the joint were allowed to remain ; and the external half only, of the tendon of the triceps muscle, was cut, which, in all probability, soon became continuous again ; therefore, in that case, it was not surprising that the power of extension was regained.

In Case II. the transverse incision was carried across, above the olecranon, from the spinous process of the os humeri on one side, to that on the other, penetrating to the bone. After the cure, the flexion of the fore-arm on the arm was very distinct ; but, with respect to extension, nothing is said, from which, as Mr MOREAU is very accurate in describing the motions that were regained in all the other cases, there is reason to believe that this patient could not extend his arm.

But Case I. is the most remarkable. The arm being in a state of semiflexion, he plunged the scalpel in upon the sharp edge or spine of the inner condyle of the os humeri, about two inches above its tuberosity ; and, directed by the spine, he carried the incision down to the joint. He

did the same on the other side. He then laid the two wounds into one, by a transverse incision, which cut through the skin *and the tendon* of the triceps extensor cubiti, immediately above the olecranon; and sawed off one piece of bone from the end of the os humeri, and then another, which, if the drawings of them be from nature, as they are said to be, were upwards of two inches and a half in length; and, having extended his lateral incisions downwards, he sawed off about an inch and a half from the ulna, measuring from the tip of the olecranon downwards. Yet even in this case, the motions of the joint, though impaired, were not lost. The bones of the arm and fore-arm, after the cure, were found to be at some distance from one another. The flexion of the fore-arm upon the arm was strong, firm, and steady; the attachment of the biceps, and a considerable number of the fibres of the brachii internus, having been spared. The bones of the fore-arm had grown together; yet, though the motions of pronation and supination were not perfect, the man could perform them, the flesh which filled up

the space between the bones of the arm and fore-arm yielding, as it were, by twisting; and the motion was extensive.

Mr MOREAU is at a loss to discover how this motion could be produced, as the radius adhered to the ulna; but it should be remembered, that in this operation, the supinator radij longus was not disturbed (p. 107). It should also be recollected, that the biceps, which is a semisupinator, was not injured; and, though the pronator radij teres originates chiefly from the inner condyle of the os humeri, along with the flexor carpi radialis, it should be observed, that there is a ligamentary cord attached to the inner condyle, from which a considerable number of the fibres of the pronator rise. This ligament, as it proceeds up along the inside of the arm, expands into a flat aponeurosis; one edge of which looks towards the bone, to which it adheres, near the inner side of the attachment of the deltoid, a number of the fibres of the brachii internus rising from its anterior side, and the fibres of the triceps extensor rising, in like manner, from it behind: while the

other edge, which looks towards the skin, gradually expands into a covering for the inner side of the arm, especially near the axilla, and, spreading out, is lost upon the breast.—From the lower end of this ligament, where it is attached to the inner condyle, so many of the fibres of the pronator radij teres rise, that, in attempting to lay the condyle bare, this ligament, which lies anterior to the longitudinal incision, must, as well as the pronator radij teres, be raised from the condyle by dissection; and they rise, adhering together by no narrow connection.

This being the case, it will be seen, that, by detaching the pronator from the condyle, if done with caution, the inside of the os humeri, near the deltoid, comes to be, through the medium of this ligament, the point to which the upper end of the pronator must be considered as attached; and, as this point is situated nearer than the condyle, to the axis of the arm, the body of the muscle in action will not lie so obliquely across the joint, as it did before.—But, notwithstanding that, its power of acting

on the radius will be thereby only lessened ; and, if it be considered, that though, as the radius and ulna had grown together, pronation could no longer be effected in the usual way, by the radius sweeping round the ulna ; yet, as both the pronator teres, and flexor carpi radialis, were still connected with the inner side of of the os humeri, and crossed the joint, though less obliquely, to be inserted into the outer edge of the radius, both the bones of the forearm, as they adhered together, must, when these muscles acted, have turned prone, because the new formed flesh, interposed between the bones of the arm and forearm, yielded by twisting. At the same time, it is evident, that, by this movement, the supinator radij longus, and the biceps, must have been put on the stretch ; nay, the brachialis, which formerly had nothing to do, either with pronation or supination, must now, by this new rotatory movement of the ulna, have been obliged to twist also ; so that, when the muscles of pronation ceased to act, the man would find very little difficulty in turning the hand supine.

But the circumstance which, in this case, I find the most difficult to be understood, is, that the man regained, in a considerable degree, the power of extending his arm. Mr MOREAU, struck with this, seems to think, that some of the fibres of the triceps extensor had been spared. But it is scarcely possible to conceive, how any of the fibres of this muscle could have escaped the knife, in making such an incision as that which he describes the transverse incision to have been; for it began at the spinous edge of the os humeri on one side, and, passing across the posterior surface of the bone, immediately above the olecranon, it terminated at the spine on the other side: and even, if, in making this incision, any of the fibres of the muscle, all of which lie on the posterior surface of the bone, had escaped the knife, they must have been destroyed by the saw; as the olecranon itself, and two inches and a half from the lower end of the os humeri, were cut off by the common saw, which, in cutting through the bones, would divide every thing that came in its way.

We would be ready to believe, that during the cure, the tendon of the triceps had formed a new adhesion with the ulna ; or that the end of that side of it, at least, which is fleshy, and is continued into, or rather sends off the anconæus, had re-united to what remained of the anconæus, which adheres for some way down on the ulna, below where it had been cut. But it is said that the bones were not in contact, and that the body of the triceps was very much wasted, which had occasioned a hollow at the inferior and posterior part of the arm ;—yet, unless the extensor had formed some new connection of this kind, or had adhered to the skin, or to the flesh, which, it is said, had grown between the bones of the arm and fore-arm, it is difficult to conceive how the power of extension could have been restored.

The information which the case holds forth, is, that the consequence of excision at the elbow is not necessarily a stiff joint ; but that, on the contrary, the motion of flexion always remains ; that pronation and supination are sometimes regained ; and, that even extension, when least

expected, is partially recovered; and the lesson that we get from the whole is, that we should spare the muscles if we can;—which leads me to state, that, except in cases where the bones are so extensively diseased throughout, that the attachment of the muscles is either already destroyed or must be destroyed in removing the carious parts, the operation may be performed, and easily too, by the chain saw, without injuring the extensor of the arm.

It may be said, that though it be an object of importance to preserve the attachment of the extensor muscles, in elbow cases, where the joint remains moveable, the surgeon may consult his own convenience at the knee, because that joint, after the operation, is stiff. But it should be considered, that though the cruræus and the vasti be extensors of the leg, their auxiliary, the rectus femoris, is a flexor of the hip joint also, and, of course, a bringer forward of the thigh; and to lose the use of that muscle, in walking, &c. must always be a serious inconvenience, whether the knee joint be stiff or not; because it acquires power by con-

traction,—the length of the lever, with which it acts, increasing as the muscle becomes shorter: whereas, most of the other flexors of that joint lose power, their lever decreasing, in proportion to the decurtation they suffer in acting. Except, therefore, it be supposed, that the ends of the common tendon of the extensor muscles, when cut above the patella, or the ends of the ligament that connects the patella to the tibia, unite after the operation, it is obvious, that, by the transverse incision, the power of bringing forward the limb must be impaired.

The question, then, comes to be, Whether do the tendons unite after the operation, or not? That they unite in some cases, is probable; that they will not unite in others, is possible. Until the point, therefore, be settled by the dissection of many limbs, in which the operation has been performed, the matter must remain as it is now, a question of mere convenience with the surgeon.

But if, in the meantime, it can be shewn, that the bones may not only be brought into view for examination, but be sufficiently ex-

posed to the action of the saw without the transverse incision, by which alone the extensor muscles suffer, you will, I am persuaded, agree with me, that the operator ought not to put the facility with which he may be able to perform the operation, in one way, in competition with the benefit which the patient must receive from it, if done in another manner.

Recollect, then, the relative situation of the different parts about the joint; and you will find, that, by making two longitudinal incisions only, one on each side, and of sufficient length, as practised by Mr MOREAU, the chain saw can be entered at the wound on one side, and be conducted by the needle, across and in contact with the upper side of the bone, to the wound on the other; and from thence it can be brought back, under the bone, with equal safety and ease. You have seen the saw applied in this way, to the bones below the joint, as well as to those above: and though the swelling of the parts must render every step of the operation more difficult in real practice, than on the sound limb of a dead subject, yet I persuade myself

you are convinced, from what you have seen, that, however necessary it may be to lay the two lateral incisions into one by a transverse cut, before the straight saw can be applied, few cases will occur, requiring a transverse incision, if the chain saw be used.

This, I cannot but consider as a great point gained. It not only diminishes the cutting, but keeps us free from all fear and trouble respecting the flaps; and it puts it in our power, when the ends of the bone are laid in contact, to bring the lips of the wounds at the sides so accurately together, that we may, in some cases, hope for a cure, as in Mr PARK's case (p. 70), by the first intention.

It remains, then, that we consider, Whether the difficulties in performing the operation with two lateral incisions, be greater than the benefit to be derived from sparing the extensor muscles?

Mr MOREAU has given two cases, of excision at the Ankle Joint, which throw much light on the subject. In these cases it was, and in all such cases ever will be, difficult to avoid the

tendons, the blood vessels, and the nerves. If a transverse incision be attempted, either before or behind the joint, they must suffer. He made no transverse incision, but, directed by the course of the tendons, he made two crooked lateral incisions; and, raising the flaps, so as to lay the bones bare, he struck off the end of the fibula, with a chisel; then, by raising the integuments from the tibia before, and passing a scalpel through between the tibia and the flesh behind, he got the blade of a narrow straight saw, fixed in a handle, introduced; and cut the bone, sawing from before backward, which, he says, was a work of no small trouble (p. 143). That being done, he turned the foot outward, and, making the piece of bone, which he had cut off, project, he detached it from the joint without difficulty.

The question, then, for your consideration, is, Whether, what he thus did at the ankle without difficulty, and with instruments not very well adapted for the purpose, may, or cannot, be done at the knee and the elbow, with the flexible saw?

If the lateral incisions be made long enough, as they ought always to be, I can say, you will find no difficulty in cutting the bone with the chain saw. You will find it still more easy to divide the lateral ligaments, because they present themselves to your view. The greatest difficulties which you may expect to meet with, will be that of cutting the capsular ligament, and of separating the flesh from the bone, before and behind. But here you will recollect, that at the elbow joint, the triceps extensor is not connected to the posterior part of the os humeri for some way above the joint, and the brachialis internus is equally free from it for some way before. It is the flesh, therefore, at the sides only of the elbow joint, along the spinous edges of the os humeri, and at the condyles, that you will, in the first instance, have to detach from the bone; and in this you can find no difficulty, for it will be as easy as raising a flap.

The only difficulty, then, that remains, is that of cutting those parts of the capsular ligament which are covered by the flesh, and the skin on the fore and back part of the joint. And here

you may consider, whether the distance from the one side of the joint to the other, at the ankle, be very much less than at the elbow.— Mr MOREAU does not say that he found much difficulty in cutting the capsular ligament of the tibia there. But let it be supposed, that the soft parts are very much tumified, and that you cannot easily get the ligament, especially at the back part of the joint, divided, while the bones are in situ; you still can, by having previously cut the os humeri above the joint, make the cut piece project, as Mr MOREAU did, when he found no difficulty of removing the piece which he had cut at the elbow. Or, if the contraction of the flexor and extensor muscles be so strong, as to draw up the inferior part of the limb so powerfully, after you have made the bone project, that you cannot get the cutting edge of your scalpel or bistoury introduced with safety, between the flesh and the bone; you still have it in your power to introduce a concealed bistoury, and easily to cut one half of the capsular ligament, either before or behind, at one side, and the other half at the other.

Or, supposing that you find it difficult even to do that, and that the bones have grown together in the joint, as sometimes happens during the disease, you can lead your flexible saw through by the needle, between the flesh and the bone, and, with it, you can cut from behind forward, both the capsular ligament and bony adhesions. If the os humeri has adhered to the olecranon behind, and, anxious to save the extensors, you wish to save the olecranon, part of it, at least, being found, you can, by detaching the skin from its sides, lay it so completely bare, as to be able, even when the parts are greatly thickened, to pass your chain saw behind the os humeri, and, by cutting downwards, detach it from the olecranon; so that the cut piece of the os humeri, being thus insulated all around, will be easily forced out of the joint. And now, the extensor muscles being safe, you will be able to turn out the ends of the os humeri and ulna for examination, and proceed in the operation, as the circumstances of the case may direct.

Here, I think, you will not forget, that the olecranon receives its nourishment from the soft

parts that are connected with it behind. Its hooked point, and its articulating surface, are, in general, the parts of it which are diseased. These, as Mr MOREAU did, you can saw off or pare away; and, if you leave only the periosteum, and the tendonous fibres of the triceps that expand out into the fascia of the arm, there will be hope left, that the power of extension will not be lost. If, however, the olecranon, and so much of the ulna, be diseased, that even by the anconæus and tendonous expansion of the triceps, the extension of the arm cannot be saved, you will have the satisfaction to think, that you have done all in your power to preserve it.

Mr MOREAU (p. 101, note) states the difficulties of cutting the fibula and ulna with the common saw, thus:—"The bones of the forearm must be cut with a small saw. The flesh comes too much in the way of a large saw. The small one is difficult to manage; but what better can we do? And, when you add to this, the risk of cutting the vessels, which, at this place, pass through the interosseous li-

“gament, you will see how difficult this operation must be.”—No words, that I can use, could set the advantages of the chain saw, in cutting the bones, whether of the fore-arm or the leg, the wrist or the ankle, in a clearer point of view. It can, in all these situations, be led through between the arteries and the bones, without doing injury to either; and, as it cuts *from* the artery, it can, while the artery is drawn aside, be sunk into the bone by a few pulls, after which the artery is out of all danger.

You may perhaps think, that though, in this way, the blood vessels may be avoided, and the muscles spared, at the elbow, it will be impossible to perform the operation in the same manner at the knee. The knee joint is, indeed, larger than that of the elbow, and is, in several respects, differently constructed; but, if you recal to recollection what you know about the knee, you will find, that the same principles which direct the practice in the one case, apply equally to the other. The os femoris must be cut, before you can expect to dislocate the joint; and to do this with the chain saw, it is

not necessary to lay the joint open, by cutting the tendon of the extensors above, or the ligament of the tibia below the patella.

The popliteal artery lies far from the bone. You will find it no very difficult matter to divide that part of the capsular ligament, called the lateral ligaments, for these will present themselves at the lateral wounds to the knife: nor can you find much difficulty in raising the skin that covers the capsular ligament before, all the way up along the edges of the femoral pulley, to the upper end of the patella; and behind, along the edges of the condyles, as far up as the heads of the gastrocnemius muscle. To go farther up, either behind or before, or to detach the gastrocnemius muscle behind, or cut the capsular ligament of the patella at the upper end of the femoral pulley, will not be necessary, at least at first, because you will generally find it convenient, whether the disease has advanced higher up or not, to cut the bone immediately above the condyles. To do this, you will find it very easy to conduct the saw by the needle, through between the bone and

the patella before ; and close to the bone, immediately above the condyles, below the heads of the gastrocnemius muscle, behind ; and to saw off the whole of the large lower end of the os femoris at once : and, if you press the head of the cut piece to one side, through either of the lateral wounds, you will be able to raise, and even to put a wedge in below, the under part of the bone at the other side, so as to be able to get the point of the curved probe-pointed bistoury introduced between the bones, and to cut the crucial ligaments within the joint. The bone being now detached from all its natural adhesions, you will, in most cases, be able to force it out of the joint by pressure, as the glenoid cavities of the tibia are shallow ; but, if the contraction of the muscles be strong, you will find no difficulty in knocking out the cut piece, by a jerk or a blow.

Let it be supposed, however, that during the progress of the disease, the surface of the inflamed bones has adhered, by the induration of effused osseous matter ; and that the piece which you have cut off from the os femoris has grown

to the tibia, so firmly, that it cannot be forced out of the joint. In such a case, which is by no means uncommon, the surgeon who operates in the usual manner, will be obliged to dissect away the flesh from behind the bone in the ham, which will not be easily done, and he will find it necessary to introduce some solid substance behind the bone; then, having pressed back the skin and the flesh at the sides, he must cut through the preternatural adhesions at the joint, by sawing backward towards the ham.—But you will meet with no difficulty here. You will pass your needle across the joint behind, and lead your saw at once into the channel between the two heads of the bones; and again passing it across the joint, between the patella or its ligament and the bones before, you will bring its cutting edge to bear upon the adhesions between the bones; and, sawing inward, towards the centre of the joint, you will, without risk to any of the surrounding parts, cut through the preternatural adhesions, the crucial ligaments, and whatever else may be in the way.

The piece of bone being removed, the condition of the remaining parts can be examined, by bending the new-formed joint, turning out the ends of the bones, and twisting the anterior flap, if I may call it a flap, at the knee, thereby bringing the patella into view.

If that bone be diseased throughout, you can remove it as easily as if you had laid open the joint by a transverse incision. If it be only partially affected, you can, with the gouge, pare away the diseased parts. But if it be found, you will, by your caution, in gaining, as Mr MOREAU says, the power of stopping short, have done your patient an essential service.

If the os femoris be diseased higher up, it can now be laid bare without risk, because the finger can be introduced to guard the soft parts, and direct the knife; and the saw may be applied again, with the utmost facility. It has, indeed, been a good deal used, in operations of a similar nature,—such as cutting off the carious or protruding ends of bones from stumps, in cases of sloughing after amputation—removing angular pieces from bones, in cases of com-

pound fractures—cutting out pieces of bones, in cases of necrosis—and sawing off the callous extremities of bones that would not unite after fractures;—for which purposes, it is found to be particularly well adapted.

Mr MOREAU, after he had extended his lateral incisions downward, and raised his inferior flap, was obliged to strike off the diseased head of the fibula with a chisel. You will be able to do this less violently, and more correctly, with the flexible saw; and, as you can apply it to the head of the tibia, on any side, and cut with it at any angle, you will have it in your power to take away all that is diseased (spots and cancelli excepted), and no more than what is diseased; though, for obvious reasons, you will see that both the os femoris and tibia should be cut directly across; for then, notwithstanding that more may be lost than was actually diseased, you will have it in your power to bring the ends of the bones into more extensive and intimate contact.

The last circumstance in this operation, to which I wish to turn your attention, is the preservation of the nerves.

The blood vessels, you have seen, are not in the way of danger. Mr MOREAU never found it necessary to take up an artery; and in Mr PARK's second case, two arteries only required the ligature. The muscles have, indeed, suffered severely; but that, you have seen, was necessary for the application of the straight saw.

The nerves are mentioned directly, in one case only, viz. the first of Mr MOREAU (p. 107), where it is said, that the cubital nerve had been cut in the operation; and, as might be expected, the consequences were, that the back of the hand had evidently wasted, and the little finger had no feeling. Such consequences must always inevitably follow, more or less, in proportion to the injury done to the nerves. Therefore, as the benefits resulting from the operation, when performed successfully at the elbow, are greater than when performed at any other joint; and as it is, on that account, probable, that the operation will be performed more frequently at that joint than anywhere else, you will be sensible of the propriety of turning your attention to the course of the ulnar nerve,

which, from its situation at the inner side of the elbow, is particularly in the way of the knife, in making the internal longitudinal incision.

The internal spinous process of the os humeri terminates in, or may be said to enlarge into, the inner condyle. The ulnar nerve comes down along the inner side of the arm, inclining backwards, till it get behind the spinous edge of the bone. It then continues its course, and, receding still farther behind the spinous process, as it descends, it passes behind the inner condyle,—where, when the arm is bent, it is sunk in between the condyle and the inner side of the triceps extensor, and is covered only by the thin fascia of the arm and the skin. After it passes the joint, it advances gradually forward, to run down on the fore part of the ulna.

These circumstances being kept in remembrance, you will understand how the cubital nerve came to be cut in Mr MOREAU's first operation; and you will see how, if you wish to preserve it, you ought to proceed.

The arm being in a state of semiflexion, which is generally the case if the complaint has been of long duration, he plunged his scalpel in upon the sharp edge or spine of the inner condyle of the os humeri, about two inches above its tuberosity; and, directed by the spine, he carried the incision down to the joint. By taking the spine for his guide, you will perceive that the incision must have passed down, anterior to the nerve. He made a similar cut on the other side, and then laid the two into one, by a transverse incision on the posterior part of the joint, immediately above the olecranon; by which means, the ulnar nerve must have been inevitably divided.

If, therefore, you wish to perform the operation in Mr MOREAU's way, you would do well to bear these things in your remembrance; but if, from what has been said, you would rather chuse to avoid the transverse incision altogether, the following circumstances deserve attention.

If the incision be made farther forward than the nerve, you will find it difficult to carry it far below the joint, as the nerve, in crossing to

the fore part of the ulna, will come in the way; and, if you make the incision at a considerable distance behind it, you will find it in your way in raising the muscles and skin, in order to get the condyle laid bare. This shews, that the course of the nerve is nearly that which the incision should follow. You need not be alarmed at this, for you will run less risk of wounding the nerve by seeking it, than by trying to shun it. It is large, and you cannot miss it: It is white, and you must easily see it: It lies close to the bone at the back of the inner condyle, where you will be sure always to find it: It is held in its place by cellular membrane, which you can easily separate; and, if you follow it, keeping the edge of your knife inclined a little away from its posterior side, you will find that your incision, which will thus run along the posterior side of the nerve, will be in the most convenient situation. You will now be able to raise the nerve; and, by causing it to be drawn either to the one side or the other, as you may find necessary, you will have it in your power to lay the bones bare, and to open

the joint, without fear of injuring the nerve.—
As the saw may be applied to either side, you
will find it most convenient, as well as safe, to
introduce it by the needle, from the outer side,
for then, in cutting the bone, you will saw from
the nerve.

These are the principal observations which I
have at present to lay before you, on this diffi-
cult and important operation;—from which, I
trust you will see, that fortunately the blood
vessels are not in much danger;—that to remove
the diseased bones, is indeed the first, but by no
means the only object, to be kept in view;—
that you should endeavour to spare the muscles,
and also the nerves. To do that with the instru-
ments in common use, is almost impossible.—
How far it can be effected, by means of the saw
which has been proposed, time must shew.

I have the honour to be,

GENTLEMEN,

Your most obedient and
humble servant,

JAMES JEFFRAY.

GLASGOW, }
April 25, 1806. }

the joint without fear of injuring the nerves.
As the law may be applied to either side, you
will find it most convenient, as well as safe, to
introduce it by the needles from the outer side,
for there, in cutting the bone, you will save from
the nerve.

What are the principal observations which I
have to present to you before you, on this dis-
cuss and important operation?—First, which I
am to you will tell you, for certainly the blood
which is not in such danger, that is to remove
the diseased bone, is indeed the first, but by no
means the only object, to be kept in view;—
that you should endeavor to spare the muscles,
and also the nerves. It is done with the instru-
ments in common use, is almost impossible.—
How it can be effected, by means of the saw,
which has been proposed, I cannot tell.

I have the honor to be, Sir, your obedient servant.

GENTLEMEN,
I am, Sir, your obedient servant,
Your most obedient and
affectionate servant,

JAMES JEFFREY.
Gentlemen,
April 25, 1802.

EXPLANATION OF THE PLATES.

PLATE I.

This plate represents, of their natural size, the pieces of bone that were removed from the patient who was the subject of Case I. in M. MOREAU's work.

Fig. 1. The inferior extremity of the os humeri, viewed from before. It is seen to be enlarged, and a good deal diseased.

Fig. 2. The inferior extremity of the os humeri, viewed from behind. At the upper and outer border of the cavity for the olecranon, a hollow may be observed. This was produced by the gouge, which was used, in order to ascertain the colour of the bone.

Fig. 3. The second piece of the os humeri, viewed from before.

Fig. 4. The same piece, seen from behind, where it is somewhat diseased.

Fig. 5. The upper end of the ulna, seen from the inside.

Fig. 6. The same, seen from the outside. The two articulating surfaces are destroyed by caries.

Fig. 7. The upper end of the radius, shewing the cut made by the saw.

Fig. 8. The upper end of the radius, shewing the glenoid cavity, which is destroyed by disease. The

oblique cut, by which he was enabled to save the attachment of the biceps, may be perceived.

PLATE II.

This drawing represents the actual appearance of the arm, which was the subject of Case I. It is seen from the outside. The scar of the external lateral incision, and a part of that of the transverse, may be seen. The natural dimensions have not been preserved.

PLATE III.

Fig. 1. A view of the piece that was sawn off from the os humeri, mentioned in Mr PARK's Subsequent Observations, seen from before.

Fig. 2. The same, seen from behind.

Fig. 3. A view of the piece that was broken off from the os humeri, seen from before.

Fig. 4. Posterior view of the same.

Fig. 5. The chain saw, rather less than nature, with one of its handles, and the needle, which is represented a little too straight and too sharp.

Fig. 6. Its other handle, to be hooked on when the needle is taken off.

Fig. 7. A side view of part of the saw, magnified, in order to shew how it is constructed.

Fig. 8. A back view thereof, to shew the three pieces, of which each joint is composed.

FINIS.

ERRATA.

Page 130, line 21.—After the word *incision*, *read* on each side of the thigh.

Page 132, line 4.—*For* outer side the knee, *read* outer side of the knee.

TO THE BINDER.

PLATE I. To face page 100.

—— II. To face page 106.

—— III. To face page 175.

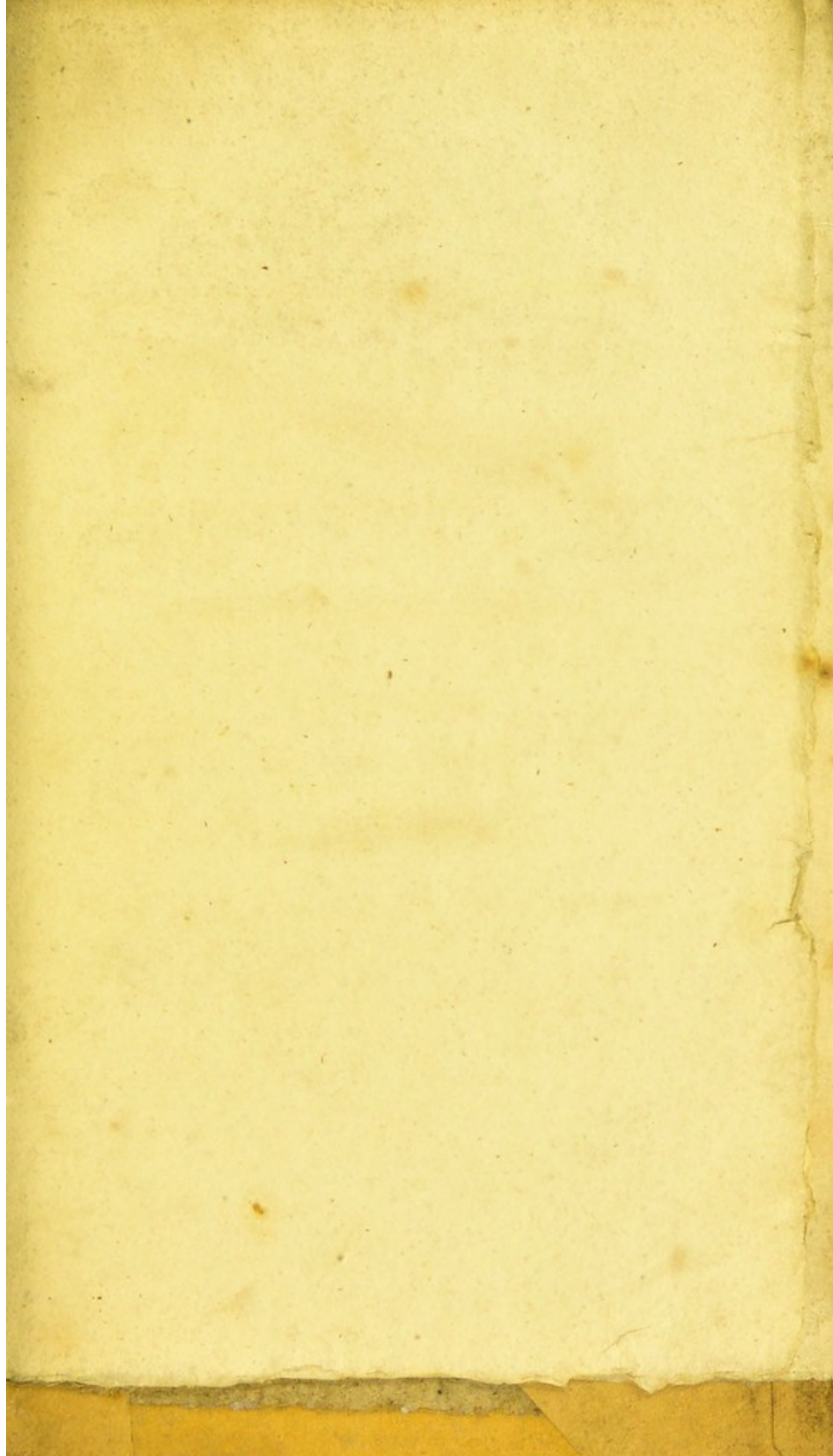
ERRATA.

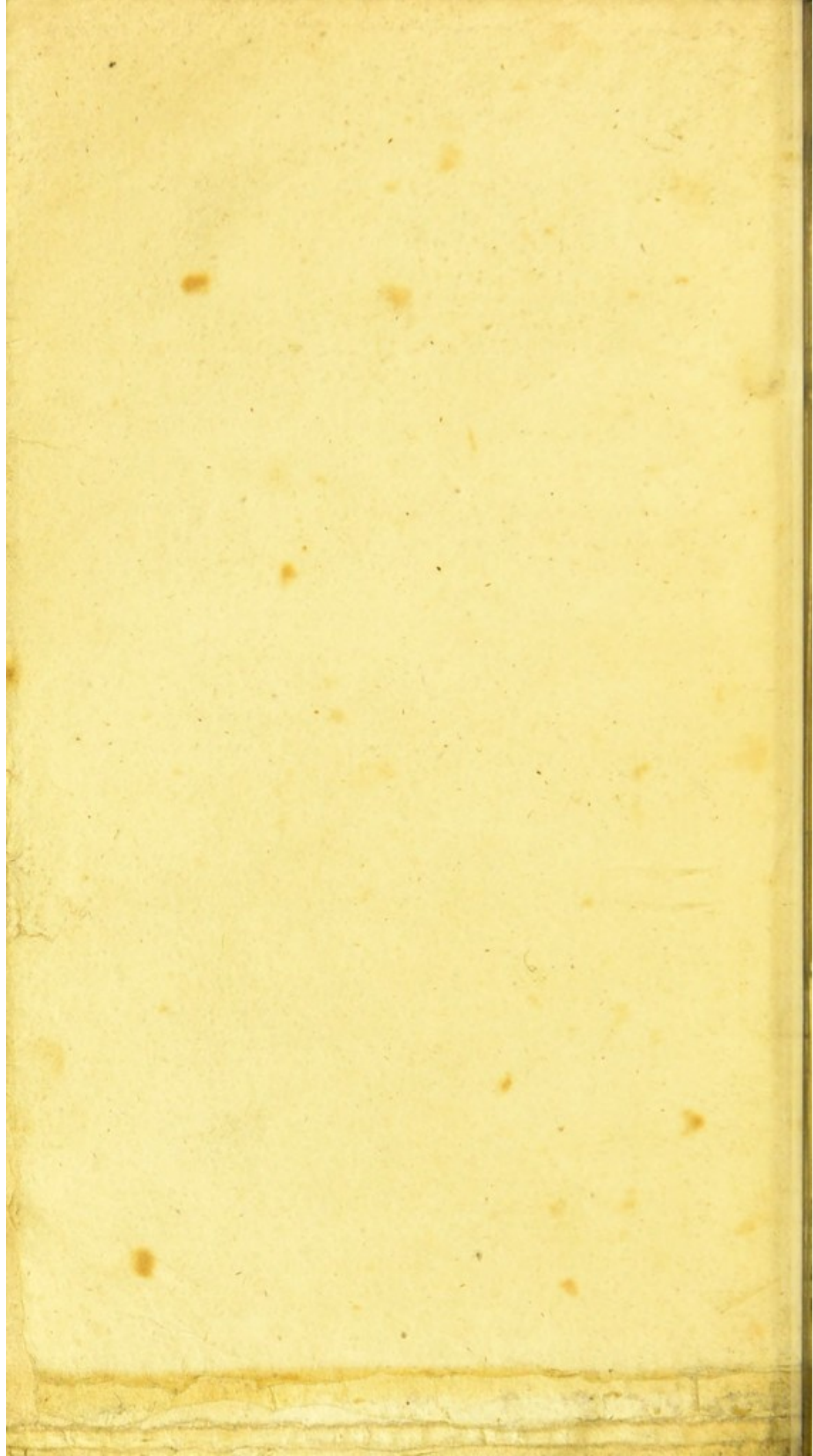
Page 120, line 21.—After the word "inches," read "on each side of the right."

Page 122, line 4.—The word "the" should be "the" and "the" should be "the."

TO THE READER.

Plates I. To page 100.
— II. To page 100.
— III. To page 100.





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P. 4. Moore's

Cases

