Its frequency appears to have led Rhea Barton into the error that there was a form of fracture limited to this region of the bone, requiring to be distinguished in practice from Colles's fracture. His idea of the mechanism of the injury is quite the reverse of what we see in action here; for he supposed that pressure of the carpus in over-extension detached the fragment. In the eleventh specimen of the series, a branch is traced passing off from the first fissure towards the anterior depression in the scaphoid facette; this fissure is seen in the bone, but as we often find in such, has left the cartilage intact. In the twelfth specimen, the fissure starting as before, passes along the route indicated in the preceding, but without any posterior branch. In the next five specimens, the primary fissure exists with its anterior and posterior branches. In three of the four remaining specimens, the features of the comminutions are the same, but chronic rheumatic arthritis has masked their exact details, so that it is difficult to follow them. In one specimen only are the features of the lines of the fracture entirely different; in it an oblique line seems to have detached the styloid process, passing from in front backwards and inwards across the scaphoid facette.

There appears then sufficient ground for the assertion that the mode of comminution is constant, and that it results from the impaction of the upper into the lower fragment, taking effect first and chiefly on the side of the fragment next the ulna.

A further examination of these specimens shows that, where the fractures remain sufficiently distinct in outline to trace their details exactly, the impaction of the fragments is reciprocal; that while the posterior surface of the upper pierces the lower, the anterior of the lower penetrates the upper, it may even lead to its splintering. This conclusion is at variance with the opinion of Voillemier; but I believe the explanation of the discrepancy between us is, that hitherto the examination of comminuted specimens has not been made with sufficient care. I believe that in many simple fractures no impaction whatever occurs, and again that in many injuries, Voillemier's third variety, the bending of the anterior wall with posterior impaction, occurs. I cannot resist the conclusion to which this collection leads, that in comminuted fractures, which occur in proportion to simple injuries almost in the ratio 2.3, the characters are constant and the result of reciprocal impaction of the fragments.

The limit of time forces me to deal very briefly with the complications of Colles's fracture presented by the series before the meeting, viz.:-

1. Necrosis of the lower fragment in the simple fracture.
2. Fracture of the shaft of the radius higher up.
3. Fracture of both bones of the fore arm, also higher up.
4. Fracture of the styloid process of the ulna.

1. The fracture in which necrosis occurred is entirely exceptional; the injury was in all respects of the ordinary type, without excessive deformity or any wound. On the patient, of 35 years of age, resuming work at the close of the treatment, which lasted about five weeks, the limb suddenly swelled and abscesses formed, leading finally to amputation.

2. The fractures of the radius alone, higher up, are seen in two instances where the usual distortions of such injuries are absent, or at least very slightly marked; phenomena which I have myself noticed in this complication occurring in the living, the Colles's fracture, so to speak, taking precedence in establishing its deformity, while the fracture of the shaft was discoverable chiefly by its pain and local crepitus.

3. In another specimen, where both bones are broken, the radius very high up, the features of the fracture suggest its having occurred independently of the Colles's fracture.

4. In the instances of fracture of the ulnar styloid, the characters of this complication are well seen. These specimens were more numerous than the collection shows, for I have, in dissecting some now not characteristic specimens, noticed this lesion, but the little fragment of bone is lost in maceration or after the specimens dry. I am confident that in all the fracture occurs as in the examples preserved—a fracture of the styloid caused by traction on the lateral ligament of the wrist, free of direct relation to the attachment of the saciform ligament; that this fracture unites in the majority by ligament only with very insignificant deformity. I notice these points merely to give expression to the opinion I hold as to this complication, that it is of practical importance only as explaining the occasionally severe pain observed at the position of the ulnar styloid, that it is quite unimportant in regard to the deformity or other leading phenomena of Colles's fracture.

Of the rare injury, fracture of lower end of the radius, with displacement of the lower fragment forwards, the collection contains four specimens; of these, two agree with the description given by Professor Gordon; two, on the other hand, agree with the figure published by Voillemier. The relative number of these specimens proves the inapplicability of

the name applied by Professor Gordon to this fracture, "articular", for we see here the fractures as remote from the joint as in ordinary Colles's fractures.

The next group of our series includes two specimens of epiphysary separation, with which I have the good fortune to be able to exhibit also the casts of the limbs of the patient. The third specimen I place in this group with less confidence, but I will presently state my reason.

The two recent specimens are taken from the limbs of a boy who died a few days after a fall from a height on his head, the head injury proving fatal.

The casts in these cases contrast, as many similar casts in our collection do, with the representations of the deformity in Colles's fracture, in the transverse features of their dorsal and palmar projections, and in the folding of the skin in the palmar depression, and again in the absence of abduction of the hand. If we add to these the easy reduction of the fracture, and the facility of obtaining crepitus, and, still more remarkable, the facility of maintaining the reduced fracture in place, phenomena all long since pointed out by Smith, which I may state I have frequently observed and verified myself, there are, I think, ample grounds for questioning the recent statement of Professor Macleod, that "there are no distinctive signs by which a separation of it (the radial epiphysis) can be differentiated from an ordinary Colles's fracture." The united fracture I place in this group is remarkable when compared with all or any specimen of the collection of Colles's fractures, for, while there has been clearly a fracture at the usual seat, it alone presents the feature of a styloid process bearing its normal relation to the ulnar styloid, and a carpal surface almost without maldirection. There are faint traces of an ulnar fracture just above its epiphysis, as often occurs with the radial detachment. The recent specimens, I should note, present fractures confined to the radius. On one side, the lower fragment is comminuted; on the opposite, simple; a little scale of bone is detached from the diaphysis on the side which shows the comminution.

The remaining specimen is interesting for its rarity; the radial styloid has been detached by a fracture passing sheer across through its base into the scaphoid facette; the fracture in its union suggests that the limb was held during treatment in adduction, for the normal obliquity of the carpal surface is increased in this direction.

NOTES ON DISEASE OF THE WRIST:

WITH REPORT OF A SUCCESSFUL CASE OF EXCISION OF THAT JOINT IN A CHILD SIX YEARS OLD.*

By JOHN FAGAN, F.R.C.S.I.,

Surgeon to the Belfast Royal Hospital and the Belfast Hospital for Sick Children.

ACUTE inflammation of the wrist, like that of any other joint, whether depending on traumatic or on specific causes, is a condition that requires a certain stereotyped method of treatment with which all are familiar, and would not require more than a passing notice, but that I feel there is one feature in it that is not sufficiently attended to, the neglect of which may lead to a chronic or subacute inflammation, frequently ending in complete disorganisation of the joint; this feature in the treatment, and the one I consider of most importance in this, as in all joint-affections, is rest.

Rest for a joint, but especially for the wrist, means more than placing it on a splint and securing it by a bandage; by this means you may render the forearm and hand motionless, but rest in the true sense of the word is not obtained. To be effectual, it must be both comfortable and continuous. By *comfortable*, I mean that all causes of irritation, both extra- and interarticular, must be avoided. There is to be no strapping, blistering, painting with iodine, etc.; while the interarticular pressure produced by the tonic contraction of the muscles surrounding the joint must be relieved by an extending and counterextending force properly applied. That the rest be continuous is also of importance, and it should be prolonged till the joint can be freely moved without causing any pain. The mode I have lately adopted for carrying out this principle of treatment in cases of wrist-affections I will explain further on.

We frequently meet with wrist-joints that have been diseased for a considerable time, in which the structures entering into their formation are more or less disorganised; this condition we designate chronic arthritis; it may be the result of traumatic causes, or, if you will, of the scrofulous diathesis. To know what is the best line of treatment to follow in such cases, is often a very puzzling question; and it is in reference to this, I believe, that surgeons are most likely to differ as to the mode of treatment to be adopted.

It is not an uncommon thing to find one practitioner, who has great

* Read in the Section of Surgery at the Annual Meeting of the British Medical Association in Cork, August 1879.

faith in the unaided powers of nature, recommending the expectant method, by that meaning all recognised forms of treatment short of excision or amputation; another performs excision of the joint, thus assisting, by a timely operative procedure, to get rid of the disease and save the member; whilst a third, having given nature what he considers a fair trial to eradicate the disease, and seeing no improvement, loses confidence in her powers and lops off by amputation the offending member, looking on it not alone as a painful incumbrance, but a possible source of mischief to the rest of the body.

The surgeon who practises indiscriminately any one of these methods, may benefit some of his patients, whilst others are sure to suffer by it. That each line of treatment, if properly carried out in appropriate cases, is the best course to follow, is, I believe, at the present time a pretty well established doctrine among surgeons; the difficult point being to decide what cases are suitable for one, what for another method.

It was principally with the view of eliciting the opinions of those who have large experience in this branch of surgery, as well as to place before you a few facts bearing on those points observed by me in the course of my practice, that I have been induced to bring this subject under the notice of the Section.

As illustrating the line of treatment I adopt, I will give briefly the leading points in the histories of three cases of diseased wrist, each typical of different conditions to be met with in disease of this joint.

CASE I.—Marianne McC., aged 11, was admitted to the Belfast Hospital for Sick Children in March last, suffering from disease of her right wrist. She was in good health, and the child of healthy parents. The hand was flexed and abducted, presenting the appearance of wrist-drop. The joint was much swollen, and its outlines obliterated from about half an inch above the radio-carpal articulation to near the centre of the metacarpus; there was an irregular ulcer, about the size of a sixpence, on the palmar aspect of the joint, from which there came an unhealthy discharge. She could neither supinate nor extend the hand. She suffered considerable pain; and, when it was not supported on a splint, she carried it resting on the sound hand.

Seven months previously, while engaged in a handkerchief-factory, a fellow-worker threw a bundle of handkerchiefs at her, and, to prevent it from passing over her head, she put up her hand to stop it, when it struck her on the fingers, causing forcible extension of the wrist; she suffered sharp pain at the time, but resumed her work. Two months after the accident, she had to give up work, owing to the pain of the joint, and was under medical treatment till she came to the hospital under my care.

I noticed, whenever the sore was being dressed, that, after the anterior splint was removed, she grasped the fingers with the sound hand and forcibly extended them. I took her hand in mine and did the same with greater force; she said she experienced great relief from it, and the more forcibly it was done, the greater the ease to her. It occurred to me, then, that if I could construct a means whereby somewhat forcible extension and counterextension could be continuously applied, it would relieve the pain and consequently the interarticular pressure, one of the most important factors, I believe, in the progressive disorganisation of the joint. I believe this splint which I have constructed, and which I now show you, meets all the requirements of the case. It produces extension and counterextension with any degree of force you may wish to apply. It serves as an easy support for the arm and hand. It does not cause the slightest pressure on the diseased joint, both extra- and inter-articular irritation being avoided, while the parts are quite accessible for dressing purposes. To sum up, by means of this splint, relief for the joint, both comfortable and continuous, is secured. (See figure.)

From the time of its application, the pain abated and the condition of the joint improved, and she can now flex and extend with scarcely any pain. The rest of the treatment consisted in keeping up her strength by proper food and occasional tonics, while the sore was dressed with lint soaked in a spirit-and-lead lotion.

Among the surgical works I have consulted, in only one do I find the principle of extension and counter-extension recommended in the treatment of wrist-joint disease—viz., Dr. Sayre's book on *Deformities and Diseases of Joints*. His mode of carrying out the principle, by means of a piece of sole-leather moulded to the arm and hand, and retained in position by means of adhesive plaster, is not to my mind an effectual one, and not at all in keeping with the many other ingenious appliances figured in his excellent work.

CASE II.—W. H. W., aged 7, came under my care on May 1st. He had a delicate appearance, and was affected with chronic osteitis of the metatarsal bone of the great toe and great enlargement of the glands on both sides of the neck. His family history bad; his father and mother were delicate; two sisters and a brother died of phthisis.

On May 27th, after improving his general health, I removed the

metatarsal bone; the wound looked well for about a week, and then took on very unhealthy action. Towards the end of June, the bases of two of the metacarpal bones of the right hand and the left wrist began to swell, and soon assumed the typical aspect of strumous osteitis and arthritis. The treatment employed in his case has been nourishment of a suitable kind, to the extent compatible with his assimilating powers. I am also administering stimulants, and a preparation that I believe to be good in such cases, "Kepler's malt-extract with cod-liver oil". The local treatment of the wrist consists in keeping on a plain anterior splint, and applying the spirit and lead lotion. Extension in this case is unnecessary at present, as he suffers no pain. Although there is an abscess on the dorsal aspect, with very thin covering, I have abstained from opening it, finding, from experience, that to deal with such by the knife is a mistake.

The accompanying woodcut represents the forearm and hand placed in position on the splint, which extends from the elbow to about four inches beyond the tips of the fingers. The splint is shaped to fit the outline of the arm and hand. Extension is produced by securing on each of the four fingers the toy known as the "Chinese link" (A), to the ends of which are attached vulcanised rubber cords; these play over a grooved roller (B) in the end of the splint, and are made fast by being passed through slits in a block (C). This block plays in a slide six inches in length, on the under surface of the splint, and is adjustable by a rack set in the border of the hand-piece. The slide is deficient for about an inch at the end of the splint; this allows the block to be removed without disturbing the cords. If the wrist require dressing, it is not necessary to remove the splint; all that is required is to take the block from its slide, when the hand can be raised and the part dressed; after which the block is replaced and the requisite degree of extension again produced. Tension on any of the fingers can be modified by lengthening or shortening its cord, where it passes through the block; this can be done by stretching it till its calibre becomes less than the groove through which it passes.

Counter-extension is produced by securing to the anterior aspect of the forearm, by means of a bandage, a broad piece of strong adhesive plaster, reaching from a little above the radio-carpal articulation to within two inches of the inner condyle of the humerus. To its upper end is stitched a piece of webbing, one or one and a half inches wide, which plays over the roller (B) in the upper end of the splint, and then, passing over the winch-fashioned roller (F), can be wound up by means of a key to any requisite degree of tightness. The splint can be secured to the arm by a bandage or the straps (G, G).

Sometimes the "links" cause a good deal of irritation if the fingers be not protected by a glove, or, better still, by a fold of lint evenly applied: even with this protection, some tender skins cannot tolerate them for more than a few days. In such cases, I adopt the following method. I place the hand on a double piece of strong adhesive plaster, with the non-adhesive surfaces in contact, and mark its outline, as well as that of the fingers, with the point of a scissors. I then cut the plaster, so as to fit accurately the palmar and dorsal aspects of the hand and fingers; and, after heating and applying it, it may be securely fixed by passing a narrow bandage round each finger, and then round the hand. Pieces of tape are stitched to the finger-ends of the plaster. The rubber-cords, instead of the "links," have small buckles" (those used in hatbands) securely stitched to them; the tapes are fastened to these, when extension can be produced as before, by bringing the cords over the roller and passing them through the grooves in the block. If properly applied, the plaster should hold for several weeks, and without causing the slightest irritation.

By a very simple and inexpensive means, the same principle may be carried out without the aid of an instrument-maker, but not so effectually as by the method already described. Take a light board from half to three-quarters of an inch thick, sufficiently broad to support the arm and hand, and extending from the elbow to three or four inches beyond the tips of the fingers. Let each of the ends be rounded off, so as to form a single broad groove. To the under surface of the splint, at its centre, a piece of webbing two inches long, with a buckle at each end, is firmly tacked on. The adhesive plaster is attached to the arm and hand as before described, and pieces of webbing are stitched to it at the elbow and fingers and carried over the ends of the splint, when they are passed through the buckles, and the necessary degree of extension and counter-extension produced.

CASE III.—Lizzie T., aged 6, was placed under my care in May 1876. Both parents were healthy. She was a very healthy child before she met with this accident. About two years previously, she fell down stairs, injuring the right wrist somewhat severely. The medical man who saw it said it was a bad sprain, and treated it accordingly. It remained in a stationary condition for a considerable time; not well, yet not painful. It then gradually became worse, and, about six or eight months before I saw her, she suffered intensely from the pain of it; and, according to the mother's statement, scarcely ever got a good night's rest, while her health was becoming seriously impaired.

When I first saw her, the wrist was very much swollen, measuring six and a quarter inches, whilst the sound one measured but four and a half in circumference. The whole joint was exceedingly painful on manipulation, but especially so over the lower end of the radius, or when the ends of the radius and ulna were pressed together. She was unable to grasp anything, and all the motions of the joint caused her pain. She

was under the care of several medical men; and the expectant method, in its various aspects, was tried without avail in her case. Amputation was suggested a short time before she was placed under my care.

I employed the expectant method of treatment for a period of three months; but, seeing no improvement, resolved on excising the joint. With the child fully under the influence of ether and an Esmarch's band applied, I removed the joint according to Professor Lister's method, following as closely as possible the very graphic and exhaustive instructions laid down by him for the guidance of those undertaking it. The operation lasted one hour and a quarter; one artery (the metacarpal) required torsion. I introduced into the lower part of the wound a thick roll of carbolised tow, to serve for drainage as well as a support for the tendons.

For the first four days, she experienced the usual inconveniences following serious operations. In four weeks, the wounds were almost healed, and she began to do some knitting; and, in seven weeks from the date of the operation, she left the hospital greatly restored in health, the wounds being quite healed, and both fingers and hand possessing considerable range of motion.

It is now three years since the operation was done. She has nearly as much power in it as in the other, and she experiences scarcely any inconvenience in the discharge of her ordinary duties.

There are a few points in connection with the operation that I think worthy of brief consideration.

Various methods have been practised, all of them having for their object the removal of the diseased parts with the least possible injury to the important structures surrounding the joint. Sir W. Fergusson and Dubled employed lateral incisions; Roux and Velpeau a quadrilateral dorsal flap; Mr. Stanley and Mr. Butcher semilunar dorsal flaps; Mr. Simon a dorsal and a palmar vertical incision; and Mr. Spence a single dorsal incision. But few practised complete extirpation of the joint, leaving one or more bones of the carpus or bases of metacarpus behind.

To Mr. Lister is due, I believe, the credit of bringing this operation to the *ne plus ultra* stage of perfection, whether anatomically or physiologically considered. I heard some time ago that he was practising the single dorsal incision; and, in reply to my letter asking him if such were true and what his reasons were for altering his mode of operating, he says: "It is true, I was induced to give a trial some time ago to the single dorsal incision; but I was quite satisfied that, whether we regard facility of access to the diseased bones, good drainage of the wound, or ultimate usefulness of the hand, the radial and ulnar incisions of my own method are much to be preferred." This statement briefly sums up the advantages of this mode of operating, which I closely followed in going through the steps of the operation in my case. However, owing to its peculiarity, I observed certain precautions that are, I think, worthy of notice.

Before making the radial incision, I got an assistant to place his thumb-nail against the outer side of the base of the second metacarpal bone; in this way serving the double purpose of a trustworthy landmark, as well as a safeguard against wounding the radial artery, which lay in such close proximity. I made the first part of my incision merely a skin-wound, sinking the knife deeper as I approached the base of the metacarpal bone. At this point, the tendon of the "extensor secundi internodii pollicis" showed itself at the outer border of the wound; then, taking it as a guide, I carefully divided the tissues lying on the bones as far as the angle between it and the common extensor.

Attention to these two points will be found useful to the surgeon who does the operation for the first time, and especially in the case of a child, where, owing to the small size and yielding character of the tissues, the deviation of his knife a line out of the proper course may wound the radial artery or divide the tendon of the second extensor: two things to be carefully avoided.

Professor Lister very properly states that the tendons should not be exposed, if possible; and, in dealing with the tendon of the extensor carpi ulnaris, he says: "It should be dissected up from its groove in the ulna, care being taken to avoid isolating it from the integuments, which would endanger its vitality." And, again, when about removing the end of the radius, he says: "It is scarcely needful to disturb the tendons in their grooves on the back of the bone, the bevelled ungrooved part being enough to remove; and thus the tendon of the extensor secundi internodii pollicis may never appear at all." I cannot say what might occur in the case of an adult, or where the tissues were much matted from inflammatory infiltration; but the following was the condition in my case. Although I proceeded with great caution and very slowly, after making the two incisions, the skin retracted very much, laying bare the tendons in the immediate neighbourhood; and,

as I proceeded with the steps of the operation, all the extensors were more or less exposed as they were drawn from one side or the other. The tendon of the extensor carpi ulnaris, after its division, hung out of the wound quite bare to the extent of an inch and a half; and it as well as the other tendons were subjected to a great amount of unavoidable rough usage while the carpus and the end of the long bones were being removed. Notwithstanding this, they preserved their vitality and formed adhesions about the new joint.

Another important consideration in the performance of this operation, is the extent to which the tissues entering into the formation of the joint ought to be removed. When the whole of the carpus is diseased, there can be no question that it should be removed, together with the articular ends of the long bones; but when the disease is limited to the ends of the radius or ulna, or to the first row of the carpus, surgeons hold different views as to the method of dealing with it. In my case, the disease was confined to the end of the radius and upper surfaces of the scaphoid and semilunar bones. I required to gouge a considerable amount of carious bone from the radius; the rest of the joint seemed healthy. Notwithstanding, I removed the entire carpus, with the bases of all the metacarpal bones.

Some surgeons would have been satisfied with the removal of the diseased portions alone. Mr. West of Birmingham, in a report of two successful cases, speaking on this point, says: "It is sufficient for the purpose of the surgeon to remove whatever portions of bone are affected by caries at the time of the operation." In contrast to this, Professor Lister says: "Parts which may appear sound in a carious joint seem apt to be affected in an insidious incipient degree, and, if left behind, may lead to recurrence of the complaint." And, again: "If the whole of the structures thus liable to morbid action were cleared out, there seemed good reason to hope that success in excision of the wrist for caries might become the rule instead of the exception." I have always held the same opinion, looking on partial excision of chronically diseased joints as mischievous practice. In my case, although the disease was apparently limited to a small portion of the joint, I yet removed the whole; and I believe the result has been more satisfactory than if I had performed partial operation.

As one of the steps of the operation, after dividing the ligamentous attachments of the carpus, I tried to remove it entire by means of a sequester-forceps, as recommended by Professor Lister. This I could not do with a justifiable amount of force, and had to remove each bone separately. This instrument I found of the greatest service. It is an ordinary incisor-tooth forceps, and held with a powerful grasp each small bone while I severed its attachments. It is a question if this method of removing the carpus, although somewhat tedious, would not be a better one than its removal *en masse*, which must always be attended with considerable risk to the surrounding important structures.

I have now considered two modes of treatment of diseased wrist-joint—that known as the expectant method, and excision. I have not seen a case that I would consider suitable for the third method—amputation. In the first two cases, the notes of which I have read, I am carrying out the expectant method, but applied differently, owing to their altered conditions.

You may perhaps say, why not have persevered with it in the third case, instead of subjecting your patient to so serious an operation as that of excision? Well, I did in that case what I do in most other chronic joint-diseases similar to it. I place the case under the most favourable conditions possible as regards general health and the local affection. If, after a reasonable time, there be no sign of improvement in the joint, and if, together with this, the health begin to break down, I recommend excision. If I see a more marked local and constitutional retrograde tendency, I urge it. The principle of dallying with chronically diseased joints, when they arrive at a certain stage, is, I believe, a bad one; and the surgeon who recommends timely operative interference is to my mind a greater benefactor to his kind than the surgeon who temporises. The one gets rid of the disease by a short and decisive operation, attended with comparatively little suffering and risk, and very soon places his patient in a condition to enjoy life; while the other is little better than a passive witness of his patient's tortures while undergoing an indefinite period of suffering, and very often in the end, to save the life, has to lop off the limb, leaving his patient a crippled object for the rest of his existence.

In my case—the first, I believe, recorded in which excision of the wrist has been practised at so early an age—the patient's youth and good family history would have induced some surgeons to continue the expectant method indefinitely; but, holding the views I do, when I saw the length of time the disease had lasted in her case, the condition of the joint becoming worse, and her health beginning to break down, I felt that the disease had come to that critical stage when some decisive steps should be taken to preserve both health and hand, and accordingly I

performed excision. This was soon followed by relief from suffering, restoration to a very great degree of the functions of the hand, improved health, and a capability of enjoying life.

The successful result that I am able to record to-day, three years after the operation, is, I believe, ample justification for any little risk incurred in its performance.

ON THE FINAL RESULT OF A CASE IN WHICH THE SHOULDER AND ELBOW-JOINTS OF THE RIGHT ARM WERE EXCISED FOR GUN-SHOT INJURY.*

By WILLIAM MAC CORMAC, F.R.C.S.I.,
Surgeon to St. Thomas's Hospital.

As a contribution to the question under discussion, the resection of joints, I desire to bring before you the final result of a case which I treated during the war of 1870-71. This case has already been recorded in the *BRITISH MEDICAL JOURNAL* and *Medico-Chirurgical Transactions*; and the reader of the surgical address, at the meeting of this Association last year, was good enough to refer to it in flattering terms. But the final result has not been made public, and I trust it may prove interesting if I now communicate it to the members of this Association.

The subject of my remarks was a French chasseur d'Afrique named St. Aubin; he was twice wounded during the memorable day of September 1st, at Sedan, the severer injury being one which extensively involved both shoulder-and elbow-joints of his right arm. It was caused by a shell explosion. The bones were much comminuted, and the soft parts lacerated. Twelve days after the injury, when I first saw the patient, I excised the shattered head of the humerus and the fractured elbow-joint; and I show you the portions of bone then removed, which are faithfully rendered in the drawing (Fig. 1). Owing to the unfavourable circumstances

Fig. 1.—Portions of Shoulder- and Elbow-Joints removed in the first instance, and the Dequestra subsequently extracted.

in which the patient was placed, he made a slow recovery, and narrowly escaped death by septicæmic poisoning. Presently, I returned home, and so did the chasseur; but I kept up relations with him, and with Professor Sarazin, lately of Strasburg, under whose able care he was fortunate enough to fall. This distinguished surgeon removed from the humerus a piece of necrosed bone, evidently a central necrosis of the shaft, which I also show you. It is, however, much reduced in size, and without the bony spicula which it had at first, as St. Aubin kept it in his own possession as a kind of fetish; and here is the upper extremity of the bone, comprising the entire thickness of the shaft, on which may be seen the marks of the saw. This was removed by Dr. Goede of Bourbon Lancy, in February 1872; while the other piece, originally eleven centimètres long, was extracted by Professor Sarazin in November 1875, a description of the operation being given in the *BRITISH MEDICAL*

JOURNAL (January 22nd, 1876). The presence of these pieces of necrosed bone had, of course, retarded the healing of the shoulder wound, and maintained a continuous suppuration from several sinuses in this region. The elbow wound healed well in the first instance, and with very complete reproduction of bone, so that the external configuration of the joint is but little changed, as the photographs plainly show, and the power of movement is excellent (Figs. 2 and 3).

Fig. 2.—Appearance of Extremity when passive. Fig. 3.—Appearances of Arm and Elbow-Joint during Active Movement.

Every new year, St. Aubin writes to me a letter full of cheerfulness and gratitude, and gives flourishing accounts of his injured arm. I consider that the interesting and unique character of the case justifies me in rendering an account of what this man can do with his arm, now that a sufficient time has elapsed for it to gain strength, and also to establish the definitive character of the cure. I wrote to ask him, therefore, for the information, and received a reply in January last. He also sent me three photographs, which were taken at the same time; and I am able to give measurements, taken at my request by Dr. Goede, who lives at Bourbon Lancy, where St. Aubin resides. These are, first, from the posterior angle of the acromion to the styloid process of the radius, which measures on the right side, 45 centimètres; on the left side, 54½ centimètres; so that the total shortening is 9½ centimètres: from the acromion to the external epicondyle of the humerus measures, on the right side, 24 centimètres; on the left side, 28 centimètres; the shortening being 4 centimètres. ("This measurement", Dr. Goede says, "was difficult to take", but he guarantees its accuracy. Dr. Goede thus gives an unconscious testimony to the actuality of the reproduction of the bones and form of the elbow.) The comparative length of the forearms is, on the right side, 21 centimètres; on the left side, 26 centimètres; the shortening is consequently 5 centimètres. The circumference of the arm, taking the average of six measurements, is upon the right side, 24.6 centimètres; and on the left side, 28 centimètres. The right hand is somewhat atrophied. The circumference of the forearm is not given. The power of abduction is extremely limited.

"I now tell you", writes St. Aubin himself, "what I am able to do with my arm. Although I am no great player, I play at billiards from time to time with one of my friends, and I play very well with my right arm. I dig and hoe in my garden without difficulty. I occupy myself in leisure hours at a carpenter's bench; and I can use the trying-plane, the jack-plane, and even the German saw with my right arm perfectly well; the trying-plane fatigues me the most. I hunt, and shoot birds as well as any other sportsman, but not like a soldier, as I cannot raise my elbow to the level of the shoulder. A young fellow here has a lathe, and I often go to amuse myself with it, turning boxes and such things. I can easily carry a large pailful of water; and, in short, I do not feel any inconvenience, or even that I have been wounded at all, as I can do everything I require to do with my arm; and, were you to see me, you would scarcely believe it was the chasseur d'Afrique on whom you operated at Sedan."

This statement requires no comment. In previous letters, similar accounts were given. St. Aubin is clearly well satisfied and contented with the result, and we surgeons may, I think, be the same.

* Read in the Section of Surgery at the Annual Meeting of the British Medical Association in Cork, August 1879.