Whether the inner fragment, like the outer one, was separated from the shaft, I could not be certain; but, if it were, the displacement could not have been great. On this supposition, the upper end of the shaft of the bone would occupy the glenoid fossa, and the inner tuberosity with a portion of the shaft form the projection beneath the coracoid; while the shortening of the arm would be accounted for by the shaft overlapping the fragments. On this point, however, there must still exist some doubt, unless it be cleared up in future by a *post mortem* examination.

Dr. Robert W. Smith describes a few cases of "fractures of the greater tuberosity of the humerus" (*Fractures and Dislocations*, p. 176), which in many respects resemble the case under consideration; but, in the present instance, the amount of injury done was greater and the fracture more extensive.

Dr. Hamilton, in his account of "longitudinal fractures of the head and neck" of the humerus, alludes to the great difficulty sometimes experienced in arriving at a correct diagnosis. In relating the particulars of the only example of this variety of fracture which he ever recognised, he says: "The physician to whom the patient 'was sent thought the humerus was dislocated'. Eight days afterwards, 'Dr. Boardman and myself examined the limb carefully. . . . Although we placed him under the influence of chloroform, the diagnosis was not satisfactorily made out. We inclined, however, to the opinion that it was fracture of the greater tubercle. . . . Subsequently, the examinations were repeated many times, and the diagnosis was at length confirmed'" (*Fractures and Dislocations*, p. 221). He does not, however, refer to any instance in which the fracture was so extensive or the displacement so considerable as in the one of which I have given a description above.

Treatment.—I think that in this case the fragments might at first have been brought almost together, and maintained in apposition by means of Professor Gordon's clavicular apparatus* and the judicious application of a properly adjusted pad over the outer fragment. But it must be admitted that in such fractures the chances of complete bony union and of freedom of movement at the joint are slight indeed. Dr. Hamilton states that union "without any degree of displacement" is a "result which probably ought never to be expected" (*op. cit.*, p. 232); and Dr. R. W. Smith thinks that "when the displacement is considerable, the fragments generally unite by ligament rather than by bone" (Hamilton *On Fractures*, p. 221). At present, nothing can be done to remedy the deformity under which the patient labours; but the amount of mobility of the joint will undoubtedly increase through time—indeed, in this respect, there has been considerable improvement already, and with this small comfort he must rest contented.

I may add that Professors Redfern and Gordon also examined this case carefully, and they arrived at almost the same conclusions as I did regarding the nature of the accident. Professor Gordon's opinion as to the relation of the inner fragment to the shaft is that which I have stated above as the second hypothesis.

The patient was exhibited before the Ulster Medical Society in March last.

CASES OF CONVULSION FROM ORGANIC BRAIN-DISEASE.†

By W. R. GOWERS, M.D.Lond.,

Assistant-Physician to University College Hospital and to the National Hospital for the Paralysed and Epileptic.

MY object in this paper will be to lay before you the details of some convulsive seizures of local commencement and deliberate march in which there was found after death a naked-eye lesion of the brain, the position of which could be determined with accuracy. It has been shown by Dr. Hughlings Jackson‡ that the study of such convulsions affords one of the chief practical means of ascertaining the precise motor relations of many parts of the human brain, and of extending to it the conclusions reached by experiments on the brains of lower animals.

CASE I. Unilateral Convulsion beginning in both Frontal Muscles, in a Case of Renal Disease, with an old Hemorrhage into the opposite Cerebral Hemisphere.—A little girl, aged 8 years, was admitted into University College Hospital, under the care of Dr. Wilson Fox, on February 7th, 1874, with slight œdema of the legs and albuminuria. The dropsy had existed for two months. One day, about the time of

the commencement of the dropsy, she had been seized with severe pain in the head and vomiting; and, next morning, a series of convulsive attacks commenced, which lasted for thirty hours, the headache and vomiting continuing for some days. A few weeks afterwards, a second similar attack occurred. On admission, the child presented no evidence of cerebral mischief; she was cheerful, quick, and there was no discoverable paralysis. The ophthalmoscope showed well marked albuminuric retinitis. One day, about a fortnight after her admission, she suddenly, without obvious cause, vomited, and, a few hours afterwards, was seized with a convulsive attack, involving the left side only. A similar attack was repeated every ten or fifteen minutes for about twelve hours, when she died, the temperature rising before death to 107.2. I was able to watch carefully several of the attacks. In the first two which I saw, the earliest spasms appeared to be at the angle of the mouth, on the left side; but, in all that followed, this was preceded by movements in the frontal muscles; and I think it probable, therefore, that all the fits began thus, but that, in those first seen, the earliest movement was overlooked. The spasm in the frontal muscles, with which the fit commenced, was clonic, and occurred simultaneously and equally in the two frontal muscles. In a few seconds, clonic spasm set in in the orbicularis of the eyelids, on each side, but greater on the left than on the right. The left angle of the mouth was then twitched outwards, apparently by the action of the zygomatic muscles, the right side being quite motionless. Next the left arm began to jerk, apparently as a whole, and soon afterwards the left leg. The muscles passing from the limbs to the body were involved, and also the muscles of the abdomen—certainly of the left, and I thought also of the right side. No tonic spasm was observed. After lasting about a minute, the spasmodic contractions subsided, lasting longest in the zygomatic muscles and in the muscles of the left arm. When the movements were at their greatest intensity, there was a little contraction of both *levatoris menti*; but, with the exceptions mentioned, there was no affection of muscles on the right side. I was informed that, in some of the earlier fits, there had been some jerking of the right limbs; there was none in those which I saw. During the fits, and also in the intervals between them, the eyes were directed to the right, the axes remaining parallel, and were not moved to the left. During the fit, the pupils were widely dilated.

In the intervals, there was no return to consciousness; then, in emotional movements, the right side of the face alone moved.

At the *post mortem* examination, there was found an old clot, apparently of at least several weeks' duration, which was situated above the right lateral ventricle, just inside the convolution of the corpus callosum, the white matter of which it involved. In size, the clot was about as large as a walnut, and its centre was about midway between the anterior and posterior extremities of the corpus callosum. The clot itself did not extend outwards beyond the middle of the roof of the ventricle, but adjacent softening reached as far as the junction of the roof and outer wall, so as to approach within one-sixth of an inch of the outer part of the corpus striatum. The softening had extended irregularly to the surface of the convolution of the corpus callosum, opposite the clot, so as to involve the grey matter at this spot. Some minute extravasations over the right parietal and occipital lobes, beneath the pia mater, constituted the only other lesion to be found in the brain. The heart was much hypertrophied. The kidneys presented extreme and old-standing disease.

REMARKS.—A convulsion affecting one-half of the body, as far as our present knowledge extends, always owns as immediate cause an organic change in one-half of the brain. As the only considerable lesion, we are justified, then, in regarding the clot as the immediate cause of the fits in this case. There was, further, that condition predisposing to convulsion which accompanies grave organic renal disease. Of the systemic influence of the renal disease, the existence of albuminuric retinitis furnished a sufficient proof. The presence, however, of this additional predisposing cause does not interfere with the interest which attaches to the character of the convulsion and to the position of the lesion causing it. The rule is, as Dr. Hughlings Jackson has shown, that, in unilateral convulsions, or in general convulsions beginning unilaterally, the fit begins in the side which is first or only affected, and in some muscles on that side which are usually put into unilateral action—at the angle of the mouth, the hand, or the foot. In this case, however, the fit, which was essentially one-sided, deviated from the rule, in beginning simultaneously on the two sides, that is, in the two frontal muscles; and in this deviation it is, so far as I am aware, unique. It is interesting, therefore, to observe that it began in a muscle which is rarely, if ever, put into unilateral action. Few people indeed possess the power of moving the frontal muscle on one side only without that on the other. The orbicularis of the eyelids were next involved, but less equally than the frontal mus-

* This apparatus will probably be described in a short time by Professor Gordon. It serves for the treatment of almost all the injuries of the shoulder-joint.

† Read before the Medical Section at the Annual Meeting of the British Medical Association in Norwich, August 1874.

‡ In many places, and especially in his article on the "Localisation of Movement in the Brain", in the *Lancet* for January 13th, 1873.

cles, that of the left side being slightly affected. The orbicular muscles have a greater power of unilateral contraction than the frontal muscles, but the power is limited, is to a considerable extent acquired, and it is difficult for many persons, and especially for young children, to put one orbicularis into any contraction without causing some contraction in the other. The muscles drawing outwards the angle of the mouth were affected on one side only. Although those of the two sides are often moved together, they possess the power of perfectly separate action. The same is true of the arm and leg, in which the convulsion was strictly limited to one side. We thus see that the distribution of the convulsion in the muscles of the two sides, as far as observation went, corresponded closely to the degree of associated bilateral action of the muscles concerned, to the uniformity with which the muscles of the two sides habitually act together.

The relation between this distribution of the convulsion and the distribution of the paralysis in an ordinary case of hemiplegia a little time after the onset, will probably have already struck you. In hemiplegia, there is, with severe affection of the arm and leg on one side, moderate affection of the straight muscles which go to the angle of the mouth, much less affection of the orbicularis of the eyelids, and scarcely any perceptible paralysis of the frontal muscle. In proportion to the bilateral association in action, the muscles of the affected side escape in the paralysis, and those of the unaffected side are involved in the convulsion.

It is commonly admitted that the hypothesis of Dr. Broadbent* explains best the escape of the bilaterally acting muscles in hemiplegia, and it furnishes an equally good explanation of their involvement in spasm.† The theory is, that the muscles acting bilaterally have such commissural connections of their nuclei, that the muscles of both sides are connected with each side of the brain in proportion to their bilateral use. The effect of this is, that, if a lesion cut off the higher centres on one side from the lower, those lower centres are in such connection with the lower, and therefore also with the higher, centres on the unaffected side of the brain, that the muscles on the side which would be paralysed are affected but little, or not at all. It is evident that the same commissural connection which ensures the escape of one side in paralysis permits the involvement of both in spasm. The discharge of a higher centre in one hemisphere will involve the lower centres, and therefore the muscles, on the two sides in more or less equality, the degree of that equality being proportioned to the completeness of the commissural connection of the centres, and therefore to the degree with which the muscles are associated in ordinary action. This was precisely the condition present in the case described.

It is true that in some unilateral fits the muscles which act bilaterally are affected on one side only. Of this the case I am about to relate affords an example. The difference probably depends on the position of the lesion, and many more careful observations on the relation between position of disease and character of fit will be needed before the difference can be explained with confidence.

CASE II. Convulsive Seizure beginning unilaterally by a Co-ordinated Movement of the Left Hand, and due to Thrombosis in Veins on the Right Frontal Lobe.—A man, aged 30, in University College Hospital for phthisis, of which he was in the last stage, after a day or two of mental dulness, was suddenly seized with a convulsive attack, which lasted about a minute and was repeated every ten or twelve minutes, until his death, about two hours afterwards. After the first fit, no manifestation of consciousness could be obtained. Two of the attacks, which I was able carefully to watch, and which were said to resemble the others, were of the following character. While lying still, with his head in the middle line and his eyes directed forwards, his left hand was slowly raised to the head, the forefinger being extended and the whole arm being stiff. Just after the movement commenced in the hand, the left angle of the mouth was drawn outwards, and the head and eyes turned to the left; the hand was then slowly lowered to the chest, the fingers being bent inwards. The mouth meanwhile was drawn more to the left. Presently, the tonic gave place to clonic spasm, which involved the head, side of the face, arm, and leg, all the muscles of that side of the face, and of that side only, being at first convulsed, the left half of the occipito-frontalis jerking and the right half remaining still. Presently, the right arm began to twitch, and then the right side of the face. The mouth became equal, the lips being closely pressed together. In a few seconds more, the spasm was slighter on the left and more severe on the right side; the mouth was drawn to the right, and the eyes and head slowly turned over to the right side, the eyes maintaining their parallelism. The left side ceased to move; then the jerking on the right side also became less frequent, until they ceased

altogether, and the fit was over. He lay perfectly still until the commencement of the next fit.

At the *post mortem* examination, the whole length of the superior longitudinal sinus contained an old discoloured and partly granular clot, which did not quite fill it. It did not pass into the lateral tributaries of the sinus, except in front, where it extended on each side into a vein from the surface of the frontal lobe. The clot on the left side extended for about two inches outwards, and was *not* accompanied by marked hyperæmia of the convolutions. That on the right side, however, extended across the frontal lobe to its outer surface, as far as the short anterior limb of the fissure of Sylvius, and crossing the anterior portion of all three frontal convolutions. The veins plugged were widely distended by clot, which was dark red, mottled irregularly with paler portions. Several small branches from this right vein were also plugged for about three-quarters of an inch from the vein itself. Over the area corresponding to the blocked veins, the pia mater covering the convolutions was intensely hyperæmic and dotted over with small extravasations. On section, the grey matter of the convolution was much more vascular than that of the opposite side, but was not softened. The exact area of the hyperæmia extended in the form of a band across the three frontal convolutions, involving the greatest area of the superior and the least of the inferior convolutions, and ceasing in front half an inch from the anterior extremity of the hemisphere. There was no abnormal appearance in the rest of the brain.

REMARKS.—The convulsion in this case, in its general character, its commencement in a part capable of the fullest unilateral use, its extension to the other muscles of the same side, the deviation of the head and eyes to that side, the extension of the convulsion to the muscles of the opposite side in the same order, its subsidence on the side first attacked as it became more severe in the other, and its final gradual cessation: in all these points, the attack corresponded perfectly to the common character of a convulsion due to disease of one cerebral hemisphere. There can be little doubt, therefore, that it is to be ascribed to the disturbance of the grey matter of the frontal lobe consequent on the venous thrombosis; and, as the change in the hemisphere was circumscribed and distinct, and the movement with which the fit began was special and uniform, the locality of the lesion becomes interesting in relation to the motor points which galvanisation of the brain has revealed in the lower animals. It would seem that the locality of the disease in this case is anterior to the spot assigned by Dr. Ferrier for the movement of the arm in monkeys. It would cross, I think, the points for the deviation of the head and eyes and the movements of the mouth; but, as those movements in this case only corresponded to what is seen in the evolution of every severe convulsion of unilateral origin, however it may begin, I do not think they can be regarded as specially related to the situation of the disease.

CASE III. Tumour of Left Hemisphere associated with Fits, which were preceded by an Aura in the Left Wrist; the Aura, when arrested by a Blister, being transferred to the Opposite Side.—The case is that of a girl, aged 18, who died of acute phthisis in the National Hospital for the Paralyzed and Epileptic, having suffered for six years from convulsive attacks. None occurred while she was in the hospital, and their exact character could not be ascertained, but they were accompanied by loss of consciousness and preceded by a sensation in the left wrist. This aura existed before even the earliest attacks. About two years after their commencement, by the direction of Dr. Buzzard, whose out-patient she then was, a blister was applied to the left arm above the point in which the fits seemed to begin. For a time, they were less frequent, and those which occurred commenced by a similar sensation in the *right* wrist.* Afterwards, however, the aura again returned to the left wrist. Attacks occurred once or twice a week, in spite of treatment, and maintained the same general character, and only ceased when the decided phthisical symptoms manifested themselves. At no time was headache a prominent symptom.

After death, the sole lesion discoverable in the brain was a small tumour, about the size of a walnut, situated in the white substance of the left hemisphere, above the middle of the lateral ventricle. Its outer boundary was even with the junction of the roof of the lateral ventricle with the corpus callosum. Internally, it extended as far as the grey substance of the convolution of the corpus callosum, which was much thinner opposite the tumour than in front or behind it, and the upper part of the convolution, contiguous to the calloso-marginal fissure, was somewhat softened. A thin layer of white substance lay beneath the tumour, forming the roof of the lateral ventricle. The substance of the growth was soft, vascular, having a reddish, semitranslucent aspect. Its inner boundary was well marked, but there was no limiting capsule

* *Medico-Chirurgical Review*, April 1866.

† See Hughlings Jackson (*Medical Times and Gazette*, August 15th, 1868).

* See Dr. Buzzard, "On the Arrest of the Epileptic Aura by Blistering" (*Practitioner*, October 1868).

or adjacent softening. In its centre were two calcareous masses, irregular in shape, each about the size of a bean. The microscopic characters were most nearly those of a glioma. No structural lesion could be found elsewhere in the brain.

REMARKS.—That the tumour was the cause, direct or indirect, of the convulsive attacks must be regarded as highly probable. It was the only cause discoverable. Its duration was evidently considerable, and may well have corresponded with the duration of the symptoms. Calcareous nodules of such a size rarely form in a tumour of that character, except after a long period of time. The points of chief interest about the case are:

1. The aura existed, and probably, therefore, the convulsion commenced in the arm of the same side as that on which the tumour was situated.

2. The aura was arrested by a blister above its position and then transferred to the opposite side. The arrest by local treatment of the local commencement of a convulsion due to organic brain-disease is, of course, common enough; but migration of the aura to the opposite side in such a case is certainly a rare event.

A fit commencing by motor or sensory alterations in one side of the body must be due to changes taking place in the opposite hemisphere of the brain. Hence the commencing convulsion in this case cannot have been due to the immediate local effect of the tumour, but must have been produced by its influence on the distant grey matter of the opposite hemisphere by means of the commissural fibres, in the midst of which, it should be noted, it was placed. When, by a peripheral impression on the left wrist, such an influence was exerted on the right cerebral hemisphere as to restrain the development in it of the convulsive tendency, the influence of the tumour on the hemisphere in which it was situated was such, that that hemisphere then led the way in developing the convulsion in a similar manner by producing the same symptoms on the opposite side of the body.

The length of time which the tumour had existed without causing other symptoms is worthy of remark. It is no doubt to be accounted for by its distance from the motor tract and by its tendency to degeneration rather than to growth.

A MODE OF EMPLOYING PRESSURE IN CASES OF INFLAMMATORY ENLARGEMENT.*

By S. M. BRADLEY, F.R.C.S.,

Assistant Surgeon to the Royal Infirmary, Manchester.

MY object in this brief communication is to introduce to the profession a mode of employing pressure in certain cases of inflammatory enlargement, which, I think, will prove more efficient and convenient than the methods at present in vogue.

Whether the *modus operandi* of pressure in removing such enlargements be simply due to the support afforded to the weakened vessels, and the too abundant blood, etc., being squeezed from the part, or whether it be due partly to this cause and partly to a stimulation of the lymphatics, forms no part of my theme. I go on the idea that the advantage of pressure in certain cases of inflammatory enlargement and thickening, both acute and chronic, is well established and generally admitted, and, for the sake of brevity, shall confine my remarks to explaining the mode of compressing, 1, the testis; 2, the breast; and 3, various parts of the trunk and extremities, presuming that a little ingenuity will enable the surgeon to adapt the treatment to any other part of the body not specially named.

1. *Mode of Compressing the Testis.*—The admirable results obtained by strapping the testis in cases of orchitis are known to all; but, in spite of this, it is not as frequently practised as it should be, partly owing to the time it takes, and partly to the fact that if improperly applied, as it is apt to be, it does more harm than good, and, according to Van Buren, has even been known to cause gangrene. Further, there is the trouble of reapplying it every forty-eight hours; for in a short time the dwindling testicle hangs loose in its sticky case, and ceases to derive any good from the strapping.

The little appliance which I use obviates these disadvantages, and, while it is more efficient than the plaister, it is perfectly easy to apply. It consists of a piece of stout elastic webbing two and a half inches long by half an inch broad; five ends, each half an inch broad, are appended to each side, each of them measuring about one and three quarter inches; the upper and lower being a little shorter than the central pieces. The belt is applied to the back of the unshaven

testicle, and laced up in front from top to bottom. The last end, being placed at right angles to the rest, comes up the front of the testis, and is fastened to the first end of the tape, left long for the purpose, and by this means all is made snug and comfortable.* The apparatus is exhibited applied to an egg-pessary, and I can assure the members of the Association that it is perfectly easy to adapt it as neatly and completely to the swollen testicle. By this appliance, pressure can be applied with the greatest nicety, and, of course, as the testis shrinks, the elastic webbing follows it, so as to keep up an equal and a constant pressure; while, again, if it require tightening, this can be done in a moment without the inconvenience of depilating the scrotum as we are apt to do in dragging off adhesive plaister. I do not wish to encumber this communication with cases; suffice it to say, that I have obtained the most satisfactory results from this mode of compressing the testicle, not only in cases of orchitis, but also in hæmatocele, and in hydrocele, after preliminary tapping.

2. *Mode of Compressing the Breast.*—The breast, no less than the testis, is difficult to compress by strapping, and hence often left unstrapped when great good would accrue from its proper application. To overcome this difficulty, I have had constructed a modification of Salmon and Ody's well-known truss, and find that by this means we can in a minute apply a perfectly uniform and sufficient pressure to the entire gland, or to any part of it which requires compressing. The principal modifications consist in the hoop being larger and less stiff, in the spinal pad being very much larger than in the truss, and in the breast-pad being concave, with a diameter of five or six inches. A ball-and-socket joint, with studs inserted at different points of the outside of this pad, enables us to apply pressure to any part of the gland by means of the strap, which encircles the opposite half of the body to that embraced by the steel hoop, being affixed to any of these studs as circumstances may require. The instrument is prevented from working down by a second strap, or broad piece of tape, passing over the shoulder, connected to the hoop back and front. I cannot but hope that the advantages of this plan are sufficiently obvious to render further argument unnecessary.

3. *Mode of applying Pressure to various parts of the Trunk and Extremities.*—We not unfrequently meet with cases of inflammatory enlargement about the trunk and limbs which require pressure; e.g., the cure of boils and carbuncles is expedited, and the pain is lessened, by such treatment. The simplest, and at the same time the most effectual, method of accomplishing this, is by placing a piece of sheet lead, such as the one here shown, with a hole cut out of the centre large enough to encompass the base of the carbuncle, and then, by means of elastic straps and a lace, affixing it firmly to the part required. Anyone can manufacture such an appliance in a few minutes; the size of the lead sheeting and the length of the straps, of course, being proportioned to the size of the tumour and the part of the body to which it is applied. In the treatment of indolent bubo, with high, hard, and irregular edges, I have obtained most gratifying results from the employment of pressure by means of a piece of sheet lead placed over the bubo, without, of course, any aperture being made in the pad. The three instruments exhibited are manufactured by Messrs. J. and W. Wood of Manchester.

ACUTE INTERSTITIAL INFLAMMATION OF THE KIDNEYS IN SCARLET FEVER, FATAL ON THE TENTH DAY.

By JOSEPH COATS, M.D., Pathologist to the Royal Infirmary, Glasgow.

THE following case seems to me to be of considerable importance, and that on several grounds. In the first place, we have here an acute renal complication occurring in scarlet fever, not, however, at the usual date of the nephritis of scarlet fever, but in the course of the fever itself. Secondly, the kind of inflammation is not that usually met with in connection with scarlet fever; we have here a case of interstitial inflammation, whereas it is well known that the parenchymatous or tubal form is that commonly met with. It may be also worthy of remark, in the third place, that this is a case of acute interstitial nephritis, a form of disease whose existence has been doubted by some. In connection with the first of these points, I subjoin a brief history of the case, and an abstract of the *post mortem* appearances.

Y. R., aged 20, was admitted into the fever wards of Glasgow Royal Infirmary, under Dr. McLaren, on September 30th, 1871. The patient stated that his illness began five days before admission,

* Sometimes I have two pieces placed at right angles to the lower margin. I should add that the belt is curved a little forward at the lower part so as to form a partial bag.

* Read before the Surgical Section at the Annual Meeting of the British Medical Association in Norwich, August 1874.