1. "The movement of the sap depends upon a vital irritability, and is independent of mechanical causes."

2. "The proximate principles are formed by the vital powers of the plant acting, in conjunction with air and light, upon the fluids contained in its system."

3. "*All the phenomena connected with the growth of plants are caused by an inherent VITAL ACTION.*"

New York, Sept. 25, 1848.

CASE OF DISLOCATION OF THE SHOULDER, OF FORTY-TWO DAYS STANDING, REDUCED BY DR. JARVIS'S ADJUSTER.

BY G. O. JARVIS, M.D.

[Communicated for the Boston Medical and Surgical Journal.]

THE above is selected from a number of cases, some of longer, some of shorter duration. This is one, however, which may very justly be regarded as a fair exponent of the whole, except so far, perhaps, as there may have been any reason to fear, that in *this* the axillary artery was implicated.

It is not, however, for the purpose of showing "what has been done" that this case is presented for publication; but it is to "show how it should be done." Nor is it that another instance may be given, where through much tribulation, or some not easy to be accounted-for, yet lucky effort of our own, our labors have happened to be crowned with success; but that what may be regarded as the *true*, the *only* true principles, those on which we can with some confidence rely, may be so clearly set forth that they shall, at once, become obvious to all who will give themselves the trouble to examine the subject.

A further object is to show (not only by this case as an example, but by the philosophy which the subject itself necessarily involves) that the pathology of the two stages of a luxation, *recent* and *old*, is as distinct, and that they require as distinct and different modes of treatment to reduce them, as the several stages of typhus fever differ from each other in their pathology, requiring such a diversity in the mode of treatment to fulfil the various indications as they arise.

A still further object is, that what is regarded as the *correct mode* of using the adjuster in old dislocations may be very plainly shown. The importance of this, I trust, will not be questioned, when it is considered that it would not be strange should more than one be found of the *hundreds* who now own the adjuster, who either do not understand its use, or do not, from some cause, choose to apply it correctly, even in this particular kind of dislocation; some, perhaps, for want of time, others for want of attention, and others because the instrument itself involves principles so entirely different from those which they have ever been in the habit of using (whether true or false, it matters not), that they cannot seem to comprehend anything which would appear to reflect on those "long-cherished virtues" of surgery, or which would in any way place in the

back ground *their own peculiar* notions. For those, however, who *will* bestow their time, who *will* give their attention, and wish to understand its use, in such cases, for the sake of the good service which they may possibly thereby render in their profession, and also for those who may wish to examine the philosophy of reduction conducted on those principles, that they also may have an opportunity to practise it, I have penned this short article. But especially have I done it, that I might call attention to this much-neglected department of surgery. No department has received so little attention, and none has made so little progress, as what may very properly be called *osseal* surgery; while in fact, in point of real importance, both to the profession and the world, it is not surpassed by any, if indeed it has its equal.

It would be but an act of justice to notice, in this place, a case in many respects parallel to the one about to be related, which was reduced by the adjuster, and published in this Journal under date of March 17th, 1847, in vol. xxxvi., p. 145. The operation was performed by Prof. J. F. May, M.D., of Columbia College, and reported by Robert King Stone, M.D. The operation reflects great credit on the surgeons who performed it, since Prof. May and his reporter appear first to have designed their plan (which certainly was very correct) and then to have carried it out as designed, with very great skill. We would refer the reader to that case, as well as to the one which we shall now relate, as fully corroborating the views which we are about to advance.

During a recent visit at the South, and while I was in Mobile, Ala., I was invited by Dr. Lewis, a resident physician there, to visit the Marine Hospital of that place, of which he was physician and surgeon, for the purpose of reducing a dislocation of the shoulder, of forty-two days standing. Accordingly, on the following morning, in company with Drs. Levert and Carter, of that place, I proceeded to the Hospital to examine the case, and, if judged practicable, to reduce it. A very tall and rather spare man was shown to me, as the subject of the injury in question; yet, notwithstanding his leanness, it was obvious he had good general health, and possessed much muscular strength. I judged him to be about 45 years of age. On examining the shoulder, the head of the humerus was found resting in the axilla, partly under the pectoralis minor muscle anteriorly, while posteriorly the head rested on the axillary artery, so that there appeared to be nothing between the fingers and head of the bone, except the artery and common integuments. The artery was felt to pulsate strongly between the fingers and head of the bone, and was but slightly moveable on the head. The arm had acquired great freedom of motion, equal to what I have sometimes found in the same kind of dislocation, of at least six months standing. Attempts had previously been made in the Hospital to reduce it, but without any success.

Here some questions arose, with regard to the practicability of reduction; the most important of which was—Are there any adhesions formed between the head of the bone and the artery, which would endanger the life of the patient by reduction? Although, from some cause, the artery could be made to move but very sparingly on the head of the bone,

still, from the uninterrupted current of blood constantly flowing through the artery, as could be determined by the feel, I was led to the opinion that there could not be formed any greatly condensed cellular tissue, uniting together the artery and head of the bone, so as to endanger life by reduction, provided it could be accomplished without using violence to the parts around the joint. This opinion, I believe, was also entertained by all the gentlemen present. As it regarded the great *mobility* which the limb had acquired, although it was such, as had, with other causes, defeated all previous efforts, and would undoubtedly defy all the means in common use, still I was inclined to the opinion that by the adjuster a *momentum* might be communicated to the head of the bone, *by the muscles of the arm*, which would disengage the head, and re-open the capsule, through which, doubtless, it had escaped; and thus force it back again to its normal position within the glenoid cavity. On this point, however, none present could consistently express an opinion, having never seen the adjuster used, but all thought so favorably of it, as to desire that the instrument should be tried. Here a medical friend present (who, by-the-by, is quite clever in his profession) suggested that he could reduce it by his heel in the axilla, he having much confidence in that mode, especially since it had not been tried in the present instance. I therefore requested him to make the attempt. He, however, declined, saying he preferred to see me use the adjuster, rather than to have it reduced in any other way. I assured him that he would have that opportunity after he had made every effort in his power, for that I did not believe it in the power of *any* man to reduce it, by any of the old or ordinary means. He still entertained the opinion, however, that it could be so reduced. I then insisted the more strongly on his making the attempt, assuring him, now that he entertained that opinion so decidedly, that I could not consent to even apply the instrument until the effort was made. Seeing, probably, that I was determined on this, he accordingly made the attempt, calling to his aid, of those persons present, just such individuals as he chose to assist him. Tart. antim. had been given the patient, and was occasionally repeated during the whole operation, but, if I recollect rightly, not so as to produce sensible nausea at any time. If I may be allowed to be any judge of such matters, I can assure the reader it was not "all boys' play." After having persisted in the effort (how long, I know not, but until all hands were well fatigued), it was again given up as a bad job; and the case was handed to me to try the power of the adjuster.

The instrument being arranged, it was applied according to instructions given in Jarvis's Lectures, fourth edition, pp. 62, 63, 64. It was then stated, that in all probability, at least one full hour would be occupied in making extension, &c., before even an attempt would be made at reduction. (Reasons for this will appear hereafter.) Extension was now begun, and was increased progressively, slowly, and from time to time, as the muscles were found to yield to the extending force of the instrument, until it was judged that the head of the humerus was extended fairly beyond the line corresponding to the plane of the glenoid

cavity. We were thus occupied in applying the extending force, and in manipulating the limb, the more effectually to disengage the head of the bone, about one hour. It is at this point, then, at which we are to arrive, before even an *attempt* be made at reduction. It being therefore judged that we had now reached that point, the effort was made in the following manner. Dr. Levert, being requested to assist in the operation, placed a silk handkerchief high in the axilla; then seizing the two ends, he forcibly drew the head of the bone outward and a little upward. In this he used all his force to bring the head of the bone out from the axilla, while the arm and instrument was being carried forcibly downward and forward on the chest, so that the arm was made to press hard on the ribs. At this juncture the catch was raised from the ratchet wheel, so as instantly to let fly the whole force of the instrument; thus driving the head of the humerus forcibly upward by means of the *muscles of the arm*. On examining the shoulder, the dislocation was found not to be reduced. No time was, however, lost in applying again the same degree of force to the limb which had once carried the head beyond the plane of the glenoid; indeed, it was a little increased, since it could now be done very readily, lest possibly we might have been mistaken before, in supposing the head to be beyond that plane, while in fact it was not. The arm was again carried forward and downward, as before, while Dr. Levert again assisted, as previously, in throwing the head of the bone outward and a little upward. The catch was again raised, and let fly the whole force of the instrument with the rapidity of lightning. On examining the shoulder this time, it was found to be "all right." All present appeared to be well pleased with the operation, and the result, and probably none more so than the patient.

I beg, here, to be allowed to comment briefly on the foregoing case. Ether was not used, and for the reason that it had not been employed in any previous attempt. Bleeding and the warm bath were not resorted to, and for the same reason. I was resolved, at the commencement, that it should not be claimed that I had derived advantage from any of the ordinary means which had not already been employed. No doubt some advantage might have been obtained by employing either of them; although I confess I generally care not, if the head of the bone can be carried beyond the plane of the glenoid without too much violence being used, how strong the muscular contractions may be. The stronger they are, the more sure am I that the head, by this process, will be driven back through the capsule, without which, reduction can never take place, i. e., in the state in which old dislocations are usually found.

From the little experience which I have had, I am convinced that there are hundreds of cases of dislocation now existing, which might, by the foregoing process, have been readily and safely reduced, but which may have defied (at the time), all of the older and more common means, used *secundum artem*, and to have persisted in them would even have cost the lives of many of the patients. I cannot but indulge the hope, that in the following remarks this fact will plainly appear.

1. Reasons for adopting the foregoing mode to reduce old dislocations

of the shoulder.—In employing this mode, I refer to those cases only, where the head of the humerus lies below the glenoid-cavity, which, in fact, includes them all, except two, one only of which is classed by writers on the subject among the ordinary dislocations of that joint, to wit, that in which the head of the humerus is thrown forward against the coracoid process, resting on the margin of the glenoid cavity. In this evidently the head of the bone does not lie below the glenoid, and of course the foregoing would be a wrong application of force. The other kind of dislocation to which I refer (and only one case of the kind have I ever seen) is where the head of the humerus is thrown directly backward, resting on the neck of the scapula, under and against the spine and acromion process of the scapula. I should, however, generally apprehend no great difficulty in reducing such a dislocation, provided force be applied in a right direction; but to apply it either in this or in the one just referred to, as it was in the case of the man at the Marine Hospital in Mobile, would manifestly be a wrong application of power; while in all cases where the head lies below the glenoid, it would be a right application of that power.

Before entering fully into the reasons, &c., referred to above, it may be necessary to take a practical view of the anatomy of the shoulder; its bony articulation, the texture of its ligaments, and the arrangement of its muscles, together with the particular kind of mechanical effect which these various parts may have on each other in their several abnormal relations. As to its articulation, then, suffice it to say, it is by ball and socket; the ball relatively very large to that portion of the socket made up of bone. Independent of that security which the muscles, proper to the shoulder, give to that articulation, by being attached above and below the joint, thus passing over it, together with the additional security which it derives from the atmospheric pressure which surrounds it, several *strong ligaments* are so disposed over it, as to admit of motion the most free of any joint in the body, and yet securely to tie the bones together, so as under no ordinary movements to be displaced by this great liberty of motion. The most important of these ligaments, especially in their relation to our present subject, is the *capsular*. It surrounds the joint, is attached in its whole circumference to the margin of the glenoid cavity; reflected from thence over the head to the neck of the bone, is attached to it; surrounding, in like manner, both the head and the neck. A further fact in regard to this ligament, let us here notice; its texture is *fibrous*, its fibres lying parallel, and running longitudinally over the joint.

We will now turn our attention to the *myology* of the shoulder; and in looking at that articulation we shall find it surrounded by twelve muscles, each of which is attached, at some point, above or beyond; passing over it, is again attached at some point below the joint. We shall also find them distributed in the following order: three to pass the joint on the top of the shoulder—to wit, the deltoid, the long head of the biceps, and supra-spinatus; six to pass it on its posterior and inferior surface—to wit, the infra-spinatus, the sub-scapularis, the two teres, minor and major,

the latissimus dorsi, and long head of the triceps ; and three also to pass it on its anterior and inferior surface—to wit, the pectoralis major, the coraco-brachialis, and the short head of the biceps. All of these twelve muscles, except the three first, viz., the deltoid, the long head of the biceps, and supra-spinatus, it will be seen, when the arm is a little thrown out from the body, and *traction* applied to it, tend to cast the head of the humerus downward, and to fix it below the centre of the glenoid cavity ; and it is only while two, at least, of those muscles which pass on the top of the shoulder, viz., the deltoid and supra-spinatus, possess their full power to act, that the head, under the influence of such traction, would be likely to find the glenoid cavity, as the centre of those opposing forces. Let it be here observed, that in a dislocation of the shoulder, where the head lies below the glenoid, the long head of the biceps can have little or no effect (mechanically) on the head of the bone, to elevate it, from the fact, that the head, by being driven through the capsule, becomes disengaged from it, and the only influence which the tendon of the biceps can hold over the head of the bone, to elevate it, being through this capsule, all of such influence necessarily becomes lost to the head of the bone. Under any circumstances, therefore, in such a dislocation, the deltoid and supra-spinatus muscles are the only ones which tend to elevate that head.

Now let us view these facts in reference to our practice. In all *complete* luxations of the shoulder, the capsular ligament must necessarily be ruptured or torn ; and through this rent, must the head of the humerus escape from the glenoid cavity. The deltoid and supra-spinatus muscles are put largely on the stretch, and so must remain, ultimately losing all power to contract, becoming paralyzed by long-continued over distention, until that head is again restored to the glenoid cavity, when the tone of the muscles may be restored and the rent healed. That rent, also, be it observed, would, most likely, be a longitudinal one—since those fibres are more likely to be separated or torn asunder, than they are to be broken across ; or, in other words, any round substance, as the head of the humerus, applied with force against the inside of this ligament, so as to rupture it, would be much more likely to make a longitudinal rent than to make a round hole. A moment's reflection will doubtless satisfy the anatomist of this ; but should any one doubt it, let him try the experiment on the dead subject. This laceration may be a very free one, or it may be only sufficient to allow the head to escape, and indeed a little stretching may have been done even at that. Now suppose, in an adult but young and healthy subject, the head of the humerus should be thus driven through the capsule and lodged in the axilla, and it should there remain for five weeks or more. Within that period of time, by the reparative process which nature sets up, to repair as much as possible the injury done to the parts, the capsule has become healed, and the lacerated part again united, except so far as the neck has served to keep them asunder. The neck of the bone thus becomes closely embraced by the capsule with the head on its outside. The deltoid and supra-spinatus muscles, too, have become paralyzed ; indeed, they are almost power-

less, as may be known by their emaciated and withered form ; while all the other muscles have been able to retain nearly or quite their full vigor. Now what amount of force, let me ask, applied in the line of that limb, would re-rupture the capsule and return the head of the humerus again to the glenoid cavity ? Indeed, is it not plain that force so applied surely tends to restore the head of the humerus to the glenoid cavity ? My wonder is, how so many old dislocations of the shoulder have been reduced. Many, very many, have failed, altogether failed, in their attempts ; by using such means. But how they ever should have succeeded, it is not easy to divine, except we be allowed to suppose that the laceration of the capsule had not become strongly united, and the deltoid and supra-spinatus muscles not completely paralyzed. Under such circumstances, I am fully aware, that, in addition to that degree of extension and counter-extension necessary to bring the head of the humerus out to a line with the plane of the glenoid, to apply force, outwardly, to the shaft, near the head of the bone, would be likely in many instances to effect reduction ; but not in any other instance. It surely must be plain to every surgeon, at all acquainted with the anatomy of the shoulder, the character of its displacements, and the texture of the parts which surround it, that to depend for reduction on the application of force, in the line of the limb, with all the additional force applied transversely which one person could well command, while its capsular ligament is strong and entire (except so far as its lacerated edges are separated by the neck of the bone lying between them), and the two muscles, the deltoid and supra-spinatus, remain powerless, would be but making an attempt, to be defeated in the end. The tendency of force thus acting in the line of the limb, is not, as we have seen in such a case, to elevate the head of that bone, but to depress it ; and it is only by the force which we may be able to apply transversely, that we can even hope to succeed ; and even in this, the greater the traction on the limb, the less must be the influence of that force applied transversely on the head of the bone. With the ordinary strength, therefore, of a healthy capsule, we can hardly expect to succeed by such means.

[To be continued.]

FIBROUS TUMOR OF THE UTERUS.—GASTROTOMY.

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THE subject of the following notice is a healthy woman, 43 years of age, the mother of several children. Early in the year 1847 she discovered a small tumor in the left iliac region, for which she consulted her physician, Dr. Duncan, of Shelburne, and during a long period all known means were exhausted to arrest its growth, but without success. Being of spare habit, the superior boundaries of the tumor were easily defined. Its position was central ; it occupied the hypogastric and iliac regions, but inclined a little to the left side. It reached from the pubis to the ensiform appendage nearly, and admitted of pretty free lateral move-