Dr. Crile recorded that by administering large doses of strychnine he was able to induce a state of shock, and there is no difficulty in believing that this treatment would bring about an intense contraction of the vessels, although he maintained that it induced a relaxation; the only evidence he adduced, however, being a fall of blood pressure, which, as I have shown, does not prove that the vessels are relaxed. Assuming that strychnine in large doses produces contraction, it seems to follow that small doses would also be harmful in their influence on the vascular changes, but strychnine acts primarily on the nervous system, and in full therapeutic doses it produces an irritability of the nerve centres which in all probability favours the numerous reflex actions tending to assist in the defence of the body rather than those directed towards its hurt.

There is no doubt in my mind that whenever a patient has been put to bed, if the wound has been nicely closed, if no septic condition remains, and if no further loss of blood takes place, the whole physiological tendency is towards recovery, and the explanation of the beneficial effects of strychnine, which clinically seem indisputable, may be that it acts as a general stimulant.

In conclusion, I would point out that the views I advocate are founded on the well-known physiological fact that stimulation of a sensory nerve causes arterial contraction, whereas the view that a general paralysis of the arteries is caused by an injury has no such basis. Moreover, in addition to the exhaustion of brain power due to over-stimulation of the nerves and the starvation of brain tissue which may be explained by the theory that the vessels are contracted in proportion to the intensity of the stimulus caused by an injury, this theory that the arteries contract also explains fully those cases of sudden death in which the injury, although severe, does not affect any vital organ. It is quite certain that a sufficiently acute contraction of the arteries might suddenly overcome the power of the heart, and might thus induce death immediately from heart failure. This is an explanation of the cause of the fatal issue quite different from that which I have suggested as taking place when death is due to a prolonged operative procedure, and it seems to me that if death in the latter case is attributed to shock, death from sudden heart failure might be attributed to *acute shock*—a description which on careful consideration will, I am sure, not be considered such a contradiction in terms as it may at first appear.

Death may also be brought about by fear. Sir Lauder Brunton has recorded a case in which a man was killed, after a mock trial, by a smart stroke of a wet towel on the back of his neck, when he expected an axe to descend.* Without doubt fear causes a blanching of the skin, which must be due to a contraction of the arterioles, and it seems quite possible that these contractions might be sufficient to arrest the heart action even when produced by fear alone.

Very chronic conditions of vascular contraction, such as those causing hypertrophy of the arterioles in connexion with chronic kidney disease, might also be discussed as bearing indirectly on the questions I have raised, but I hope I have said enough to show that a careful reconsideration of our views on the vascular changes produced by an injury is necessary.

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ON ATYPICAL "INTERNAL DERANGEMENTS" OF THE KNEE JOINT.

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No surgeon can operate on a large number of cases of "internal derangement of the knee joint" without sooner or later becoming convinced that the classical description of this lesion does not cover all the displacements of structures within the joint which give rise to the symptoms usually supposed to indicate dislocation of the internal semilunar cartilage. In other words, he will arrive at the conclusion that in some few cases, where both the history and symptoms

point to a condition closely if not exactly resembling a displacement of the meniscus, the latter may be in no wise altered in its relation to the coronary ligament. And, further, that these symptoms do not depend upon a "loose body" slipping about freely in the joint unattached, and therefore felt frequently under the capsule, now in one place now in another. The fact is that the delicate mechanism of the knee joint, with its complex hinge-movement and gliding of the round condyles on the almost flat tibia, may be deranged by any substance which becomes interposed between either the bones or between the ligaments and the bones. Further, it is sometimes almost certain that irregularities produced on the borders of the articular surfaces such as arise in chronic rheumatic arthritis, will occasionally lead to symptoms closely resembling those due to a displaced semilunar cartilage.

But it is to a condition quite different to any of those mentioned that I desire now to draw attention, inasmuch as it appears fairly common and yet has been but little noticed in the ordinary literature of the subject of derangements of the knee joint. In the last dozen or so of cases in which I have operated I have found this condition three times.

There is, as is well known, behind the patellar ligament and on either side of it, a quantity of loose areolar and fatty tissue underlying the folds of synovial membrane, which follows all movements of the joint. Under normal conditions this fat and synovial tissue is yielding in every direction and escapes all pinching during movements of the joint. But in some cases, owing to bygone inflammation, traumatic or other, it may lose its great resiliency, and, moreover, be thrown into folds and prominences, and these may become engaged between some of the moving surfaces of the articulation, giving rise to symptoms deceptively like those of displaced semilunar cartilage. Such a condition is quite another thing to the hyperplastic fringes produced in tuberculous synovitis. It is certainly independent of tubercle, and the tags produced by the chronic irritation are limited to the front of the joint, behind the patella so far as I have seen.

The reason for drawing attention to this condition is that it produces symptoms sufficiently like those of a displaced internal meniscus to mislead a surgeon and lead to disappointment unless it is recognized. He may open the joint under the impression that the internal semilunar cartilage is detached from the coronary ligament and dislocated, and be surprised to find it in its usual situation and quite normal. If he look no further he will have to close the joint with the feeling that it has been opened to no purpose, and much to the patient's disappointment when the old symptoms return. I have been very near to making this mistake in several cases, and have only been saved from it by a thorough inspection of the interior of the joint with good light through the first incision. The symptoms were so alike in the last three cases that the same description will serve for all. There was the usual account of a slip or wrench of the joint, followed by pain and swelling. After this had gone down a feeling of insecurity followed. Then another slip or stumble at a shorter or longer interval was followed by more or less "locking" of the joint in the flexed position and lasting some time. This locking or stiffness was not as clearly pronounced as in the typical cases, but was nevertheless a factor in the case. The pain was always in the same place, namely, over the inner and lateral part of the knee, and of a very severe kind, though not so bad as in the most typical cases of displaced semilunar cartilage.

Nothing objective could be discovered on an examination of the knee in the intervals between the attacks to account for the trouble. Taking these symptoms to indicate a derangement of the internal meniscus, I operated as for the latter by the curved internal antero-lateral incision. On opening the joint as usual under the internal meniscus the latter was found normal, but in further inspecting the cavity during flexion and rotation outwards of the tibia a long white "tag" was seen in both cases projecting backwards from the loose tissue behind the patella. This was drawn with a sharp hook towards the opening, and was removed with scissors. The tags in these cases proved to consist of dense fibrous tissue. The patients were quite relieved of all their symptoms.

The best explanation of the formation of these loose fibrous fringes in this situation which offers appears to me to be that the original wrench of the joint had led to a subacute synovitis, and that a hyperplasia of the synovial tissues behind the patella had followed, increasing their bulk until they came to catch between the femur and tibia. Each nip thus received would increase the irritation and add to the

size of the fringe. Without a very careful examination of the interior of the joint such a body would be easily overlooked. But in the position of extreme flexion and rotation of the tibia outwards on the femur such an inspection is easy if the light be good.

This condition of things is probably not so rare as might at first sight be supposed. I have operated on several among many scores of typical cases of dislocation of the semilunar cartilage which have passed through my hands. But it seems probable that in some cases of "derangement" where the symptoms were not so severe as to appear to call for operation this condition was present. It is worth noting that the pain in all cases was in the same place, namely, over the inner anterior aspect of the knee. But, as far as I can see, this is the rule in all cases of derangement of the knee involving the catching of displaced material of any kind between its surfaces. The explanation is probably this, that when during flexion something is interposed between the surfaces of the two bones the latter cannot be fully extended without a severe stretching of the lateral ligaments of the joint, and, of the two, perhaps the internal more than the external. Be this as it may, the pain is usually referred to about the tibial insertion of the internal lateral ligament.

This fact may be very misleading, and if not fully realized may result in great disappointment. This may be illustrated by another case. In this all the symptoms seemed to point to a complete dislocation of the internal semilunar cartilage, and yet on opening the joint this was found intact, while the external semilunar was completely separated at its periphery, and was only attached at its two ends.

The patient, a gentleman of about 60, had formerly been in the army. During some violent exercise when quite a young man he had wrenched the right knee. This was followed by typical symptoms of dislocation of a semilunar cartilage—that is, pain, locking of the joint in flexion, and synovitis. The same attacks recurred from time to time, causing much inconvenience. But this was dwarfed by an affection of the left hip joint, presumably tuberculous, which after a long time healed, leaving a serviceable but somewhat shortened limb, with movements limited but not so much as to prevent exercise with the help of a stick or crutch; but for several years past the condition of the right knee had been causing much trouble. There were repeated attacks of "locking" in it, requiring chloroform for reduction. Besides this, there was always a feeling of insecurity in the right knee, which was peculiarly troublesome to one whose other leg was limited in power.

When I was consulted the pain was always described as confined to one spot on the inner and anterior aspect of the head of the tibia. Here there was also tenderness to pressure but nowhere else. During the locking, too, the pain was described as on the inside of the joint. All this, taken together with an experience of a large number of cases of this trouble among which were no instances of dislocation of the external semilunar, led me to expect to find a loose internal meniscus. But, on opening the inner anterior side of the joint, the semilunar cartilage was seen to be intact. Suspecting a tag behind the patellar ligament such as described above, I flexed the knee strongly, and rotated the tibia outwards. The light now fell well into the joint but no tag was seen; but beyond the crucial ligament I saw a white mass, and on putting a fine hook into it could draw it forward. It was then seen to be the external semilunar cartilage only held by its two ends, and forming a free loop between these. With a slender scissors passed into the joint it was easy to divide both the attachments of this loop when put upon the stretch with the hook. This semilunar cartilage now before me is of normal size and shows on its outer border where it was originally torn away from the coronary ligament a smooth surface. This is not to be wondered at, as the original tear took place, according to this gentleman's description, as long before as forty-four years. The patient made an excellent recovery, and writes that he has no further trouble.

Although I have now operated for a very large number of loose semilunar cartilages, this is the only instance in which the external was at fault. And if I had been told that it would be possible to remove the external cartilage through the usual small, curved incision in front of the internal lateral ligament which I always make for dealing with the internal meniscus, I should not have believed it. But, as a matter of fact, it offered but little difficulty, once the displaced external cartilage was seen. This case, however, reminded me of what I had suspected once or twice before—namely, that the symptoms of a dislocated external carti-

lage may all be referred exclusively to the inner aspect of the knee.

My object in writing this short communication is to point out that we may meet with atypical as well as the typical cases of "internal derangement" of the knee, and must be prepared for them. Also to insist that with flexion of the joint, combined with external rotation of the knee, we can with a good light discover which of the varieties we are dealing with. I have never been obliged to divide the internal lateral ligament, and hold this practice to be most undesirable as likely to weaken the joint. Further, my own cases—now very numerous—prove that, whatever variety is met with, it is possible to deal with the case without ever allowing the hand or finger to come in contact with the wound or any part of the joint surface. I believe this to be most important, and that it is one of the reasons why I have never had any inflammatory trouble in these joints which has injured the patients.

In a paper published in 1902 I described the many varieties of displaced semilunar cartilage which may be met with, and figured those which I had actually seen. The present communication is complementary to this, and adds, I hope, some information on an interesting subject.

ACUTE ARTHRITIS DEFORMANS.*

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THE accompanying plates are selected from a series of slides which were shown at the Leicester meeting, and are intended to illustrate some of the salient features in the condition which has been described as acute arthritis deformans. In a recent com-

Fig. 1.

munication read before the Clinical Society of London¹ some evidence was brought forward in favour of the view that there is no essential clinical or pathological difference between the chronic and acute forms of this disease. The plates now reproduced afford further support to the opinion that the

* Read in the Section of Pathology, Annual Meeting held at Leicester, 1905.