cent, the contra-indication is much less than if they are present; if remote and without other objections, these diseases are most favourably influenced by the change. If there is reason for some doubt, in any such otherwise favourable case, a gradual rise in elevation should be chosen.

8. High bodily temperature, whether it be rather constant, as in some inflammatory states, or in catarrhal extension beyond a tubercular zone, or whether it be regularly vacillating, as in tubercular infection, that is, daily low or subnormal in the morning and up to 103 degrees or more later in the day, especially with suspicious laryngeal complication.

9. Extensive involvement of lung-tissue in diseased action, that is, so that the healthy spirometrical record is more than one-half abridged. Of course advanced stage of disease renders this contra-indication much stronger.

10. The stage of softening, if accompanied by marked pyrexia, or in one of decided hæmorrhagic diathesis.

LOOSE BODIES IN JOINTS.

By G. M. HUMPHRY, M.D., F.R.S.,

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I HAVE delayed replying to the able and courteous comments by Mr. Sheild and Mr. Howard Marsh (*JOURNAL*, March 31st and April 14th) on my letter (*Loose Bodies in the Knee-Joint*, March 17th) in order that I might give the consideration to the subject which their remarks demanded, and that I might examine certain specimens which I have only lately had the opportunity of seeing.

My statement was that we have a ready and sufficient explanation of the formation of these bodies in the growths from the synovial membrane into the joint; that only by an extraordinary and violent accident could a piece of cartilage or bone be broken off into a joint, and that necrosis could scarcely be credited as a cause.

With regard to the first of these points (the formation of loose bodies from the synovial membrane, which is generally admitted), I will go into a few particulars. The synovial membrane, which is continuous with the articular cartilage as its epithelium is continuous with that of the epithelium existing upon the surface of articular cartilage in early life, is prone, under morbid conditions, to the formation of cartilage and bone in its substance. This may take place in the villous processes which exist adjacent to the articular cartilages, about the lines of reflection of the membrane and at other parts, and which are not infrequently, in the normal state, found to contain cartilage cells; and it may also take place in the substance of the membrane, more especially in the vicinity of the articular cartilages, and sometimes as an outgrowth from them. A local irritation, a sprain, a wrench, or a blow may give rise to these villous outgrowths, or to one or two of them, in the otherwise quite healthy joint; and the villous outgrowths projecting into the joint becoming cartilaginous, and perhaps osseous, becoming also pedunculated, and finally detached, and losing, it may be, all trace of their former connection, constitute, as commonly admitted, the ordinary mode of formation of loose cartilages. This is more often observed to take place in a localised or isolated manner, so as to produce one or two loose cartilages, in early life, in young men and boys, whose active movements render them especially liable to sprains, and in the knee-joint, where the extent and reflexions of the synovial membrane are so great and so numerous, where the range and variety of movements are exceptional, and where the leverage against the joint given by the long thigh and leg is greater than in the case of any other joint.

In some instances these bodies soon give rise to symptoms which lead to their removal. In others they remain before or after their detachment in snug quarters or recesses, and cause little trouble, affording perhaps no indication of their presence, till by some particular movement, or strain, or blow, they are dislodged, get into inconvenient positions, give rise to the well-known symptoms, and are found slipping about in the cavity of the joint. Thus a man, aged 63, from whom I removed one of these bodies, stated that when he was a boy the "knee used to slip out of place at the inner side, and used to kink at the joint." Twenty years ago a piece seemed to break away; and from that time it used to slip about in the joint, and it became larger and more troublesome. A young gentleman had for years suffered weakness and uneasiness in the knee, and peculiar sensations at

the back of the joint, consequent on a sprain in childhood; but the cartilage, which was quite loose, appeared in the front of the joint only a few weeks before I removed it.

A schoolboy, aged 15, whilst playing at football, fell with the left knee bent under him. He contrived to walk home, a distance of half a mile. Synovial inflammation followed, and was for some months easily re-excited, but subsequently subsided. Two years after, whilst walking in the street, he suddenly felt a severe stabbing pain in the joint, and was for some hours unable to extend it. Similar attacks, followed by synovitis, recurred, and a loose body was felt on the inner side of the patella. Having made a subcutaneous incision through the synovial membrane, I slipped the body into the tissue outside the joint, and secured it there. This was three years ago, and the body, which was about the size of a horse-bean, now feels about the size of a pea and has given no trouble.

I removed a loose body from the knee of a young man, who experienced severe pain in the joint three months previously, when straddling across a ditch gathering watercresses. He was set fast and could not move from his position without assistance. The pain subsided in a few minutes, and he was able to walk and jump over a ditch. Next day the joint was swelled, and had to be kept on a splint. The loose body was discovered a few days afterwards. On two occasions, one three years and the other a year previously, he had experienced sudden pains in the knee, but less severe than the last attack.

During this period in which they remain in retirement, as it were, they may slowly enlarge and undergo calcification or ossification in the middle; and the section of such a body may show a nucleus or centre of true bone with the characteristic corpuscles, imbedded in true cartilages with the process of ossification from cartilage to bone progressing in the ordinary manner. These loose bodies are in some instances fibro-cartilaginous, in some cartilaginous, in some fibro-cartilaginous at one point and cartilaginous at another; and the cells near the surface may be, as seen in a specimen I have just examined (a loose cartilage of the ordinary type with bone in the middle, recently removed from the knee of a young man) flattened out and lying parallel to the surface, whereas the deeper cells are more spherical and arranged more or less in vertical columns, thus simulating very closely the structure of articular cartilage. Such a body may therefore present closely the appearance of a portion of bone and cartilage detached from the articular surface of a bone. I do not think the last feature has been previously pointed out; but in reality such arrangement of cells in the superficial and in the deeper strata is by no means, as seems to have been thought, peculiar to articular cartilage and to be regarded as diagnostic of it. It is indeed a feature common to cartilage in various parts and under various circumstances. Thus it is found in the costal and laryngeal cartilages as well as in loose cartilages, also in the superficial layer of the cartilage covering ordinary exostoses in parts where the whole thickness of the cartilage is not occupied by the columnar arrangement of the cells preliminary to ossification.

My attention was first seriously drawn to the formation of these bodies from the examination of the loose body removed from the knee of the young man last mentioned, which consisted of bone and cartilage, was flat and oval (an inch by an inch and a half), and was on one side bare of cartilage and presented a plain surface of bone, so that it much resembled a portion of articular cartilage and bone. Indeed, it was much like the specimen figured 4 and 5 by Mr. Howard Marsh in the paper referred to. The explanation I then gave of the condition was, that during a long period of repose this body had not only undergone central ossification, but that one side of it, through contact with, and perhaps attrition upon, the femur or tibia, had been deprived of cartilage, and its bony nucleus had been laid bare. This view certainly seems to me much more probable than the supposition that it was the result of direct injury or of a process of necrosis separating it from any part of the articular surface of the bones. The view that in this and similar cases the origin and progress was such as I have mentioned derives corroboration from a specimen in the Pathological Museum at Cambridge, where a subspheroidal or flattened osseous body with cartilaginous margin hangs by a broad peduncle from the synovial membrane into the space between the patella and the femur. The cartilage from both the patella and the

¹ One in the museum at Vienna, which still retains its connection with the capsule of the knee-joint, is said to be as large as the os calcis. Tillmann's *Lehrbuch der Allgemeinen Chirurgie*, p. 467.

femur in the vicinity have disappeared, and the surface of each bone is somewhat worn away. It is quite certain that this pendulous body is a product or outgrowth of the synovial membrane from which it hangs, and not a detached piece of bone, and that the surfaces of the patella and the femur are in process of being worn away by its attrition; and it is almost as certain that it has, in like manner, suffered from attrition on both its surfaces, its cartilaginous covering having disappeared and its osseous part having been exposed. So that we have here a good illustration of the effect upon one another of the pendulous body and the articular surfaces.

This view also derives corroboration from two specimens in the same museum; one being that of the knee with rheumatic arthritis, mentioned in my former letter, which I excised from a man, aged 60, in which there are many loose bodies of various sizes, some cartilaginous, some with osseous centres, some loose in the joint, some connected by pedicles more or less broad with the synovial membrane. One of them occupies a concavity nearly large enough to hold it and adapted to it, in the side of the articular part of the tibia, and there can, I think, be little doubt that it, like the others in the same joint, had its origin in the synovial membrane, and that it had gradually, by pressure and friction, led to the formation of the cavity in the tibia in which it lies. In the other specimen, a loose, tubercled, bony nodule, with cartilaginous covering, larger than a filbert, is lodged, for about one-third of its thickness, in a fossa in the outer and fore part of the internal articular surface of the tibia, which has evidently been formed by the pressure and friction of the body; and the tubercles on the side of the body apposed to it have been rubbed down so as to present a nearly smooth osseous surface. The cartilage has in great measure disappeared from the corresponding femoral condyle, and it is remarkable that movement of the joint can have taken place, notwithstanding the presence of such a body in such a position. There are villousities of the synovial membrane, and "lipping" of the articular margins.

Specimen 1,926 in the College of Surgeons furnishes still better evidence of the process. In it a foreign body, an inch in its greatest diameter, attached to the crucial ligaments, has, by friction and constant pressure, worn for itself a deep cavity, with grooved walls, in the posterior and lower part of the outer condyle of the femur in which it lay imbedded and apparently immovable, and a second smaller body having similar attachment appears to have begun to wear a hole on the inner side of the under part of the internal condyle. In the museum of the Middlesex Hospital (No. 710) is a pointed fibrous growth, $1\frac{1}{2}$ inch long, hanging by a narrow neck from the posterior attachment of the internal semilunar cartilage and lying upon the articular surface of the tibia. Whether it has begun to make an impression upon that surface cannot be seen, but that it would soon have done so if it had continued in that position and gone on enlarging and hardening there can be little doubt. In a recent specimen in the same museum is a loose body, like a miniature patella, lying in a bare cup-like depression of the femur above the outer condyle; and in St. George's Museum, III, 44 b, is a smaller pendulous body hanging in a cavity above the coronoid fossa of the humerus.²

It is clear that in these cases the bodies were of long standing, had slowly grown and hardened, and had gradually—very gradually—worn, or were in process of wearing, for themselves nests in the bones on which they laid, and they might at any time have become quite detached and lost all trace of their former synovial attachments. During the time of their repose they would have caused little or no inconvenience. It would have required a considerable force, such as a violent strain or blow, to dislodge them, to bring them into notice, and to cause them to give rise to the symptoms which indicate the presence of a loose body. Their existence would thus, not improbably, be dated from the time of their dislodgment, and their origin would be attributed to the force which had dislodged them. Thus the "irregular nodule of bone" (Museum of College of Surgeons, 1,931), one side of which is bare and the other covered with substance which looks like cartilage, and which presents "no indications of its ever having formed a part of articular surface, and no broken part to show that it separated from any pedicle," was removed by Mr. Barwell from a retired army-surgeon, aged 43, subject to rheumatic arthritis. Two months before it was removed he struck his knee sharply, and the next day he found a loose body in the joint. He

had no synovitis or pain. He then missed a bony lump which he had noticed previously over the inner condyle. So also the large loose body (in the same museum, 1,935), nodulated on one side, flat on the other, partly bony and partly cartilaginous, which presented "no evidence that it ever formed part of the normal surface of a joint or was ever pedunculated," and which was excised from a man, aged 40, and presented by Sir William Fergusson, was detected after a severe twist of the knee. A young man in Addenbrooke's Hospital sprained his right knee while boxing, was carried home, and kept his bed for a fortnight. He then perceived a loose substance in the outer part of the joint. After a month he could get about pretty well. As he experienced inconvenience from the substance, he came into the hospital and it was removed. I am informed that it showed no sign of having been detached from an articular surface, and presented the ordinary appearance of a loose cartilage, being about the size and shape of a strychnine nut. The joint was, to all appearance, quite sound before the injury. Instances of the discovery of these bodies soon after injury are also given in Hey's *Surgery*; in one case there were two in the same knee, the fact of their being two precluding the idea of their being the direct result of injury.

It is well known that in rheumatic arthritis these cartilaginous and osseous bodies are very liable to form in the synovial villi, which commonly enlarge in this disease; and these may be found to have become detached in great numbers. They also form in the synovial membrane, and possibly in the subsynovial tissue, and often in close proximity to the articular cartilage.

When thus situated they may grow into contact with, or encroach upon, the thickened, outgrowing, nodulated, and "lipping" margins of the articular cartilage so often met with in rheumatic arthritis. In this borderland between cartilage and synovial membrane it is not always quite easy to tell in which of these structures the osseous bodies were formed; and of two observers, one will judge that they have originated in continuity with the articular cartilage and are in process of separation from it, while the other will conclude that they have originated in the synovial membrane and are in process of encroaching upon or coalescing with the abnormally projecting articular cartilage. The latter, which I believe to be the more common, may be often proved by noting the manner in which the several stages of growth in the membrane with approximation to the cartilage are evidenced at different parts in the same specimen. The edges of the projecting and overhanging lips of articular cartilage do, however, sometimes grow out irregularly with intervening spaces. This is well seen in specimen 709 in the museum of the Middlesex Hospital; and it is possible that they may become detached from their bases, though I have not seen an instance in which it seemed very probable that this had taken place.

It is, therefore, sufficiently proved that a loose body formed in the synovial membrane may (1) come very closely to resemble, microscopically and to the naked eye, a portion of articular cartilage and bone; may (2) in course of time form, by its pressure and friction, a fossa in the articular end of a bone more or less adapted to it, in which it may lie without giving rise to any particular symptoms, from which (3) it may become dislodged and first excite attention in consequence of a blow or strain, and so lead to the presumption, which may seem to be confirmed by microscopical examination of the loose body and even by examination of the joint, that it had been detached from the articular end of the bone by the blow or strain from which the symptoms of its existence were dated. It appears, moreover, that this is no very infrequent sequence of events, and that it may occur in a joint which presents no other indication of disease.

I should add that the presence of a loose, or nearly loose, body in the knee, caused by the tearing off one end of a semilunar cartilage from its attachment, and its nearly complete severance from the rest of the disc, has been instanced by Mr. Brodhurst (*St. George's Hospital Reports*, vol. iii), and by the specimen shown by Mr. Bowlby at the Pathological Society on April 17th. Possibly also loose bodies may occasionally originate in fibrinous masses effused into the joint after the manner often taking place in ganglions.

The dominance in my mind of the view I have expressed, as to the manner of formation of loose bodies in joints from the synovial membrane, may have led me to write in rather too strong terms against the view that they may also be formed by the detachment of portions of articular cartilage and bone by accident or by necrosis, and though on the former point I give in a little, on the latter I am still *tenax propositi*.

² It is represented in the *System of Surgery*, by Holmes and Hulke, II, 355; and in the College of Surgeons (1,927), are two "pendulous masses of bone and cartilage," in the olecranon fossa.

With regard to the former of these modes of detachment—namely, by accident—I am not aware that any reliable instance has yet been adduced of the formation of a loose body by the breaking off of a piece of articular cartilage or bone by a blow; and we can scarcely conceive such an occurrence without greater damage to the joint than appears to have taken place in any recorded case of loose body in the synovial cavity.

The specimen which has been referred to by Mr. Howard Marsh, in St. Thomas's Museum, of a fragment of cartilage and bone, taken by Sir John Simon from the knee-joint of a man, and judged by him to have been detached from the articular surface by a wrench in falling three weeks before its removal, cannot perhaps now, in its bottle, be sufficiently determined. Its minute examination, however, by Mr. Shattock is, I believe, confirmatory of the view of Sir John Simon. The accident to which it is attributed was followed only by some inconsiderable synovitis. Mr. Teale has been so good as to send me for inspection the fragment represented by him in a woodcut in this JOURNAL, May 26th, p. 1109; and its rough (fractured) bony surface on one side, and articular cartilage on the other, as seen in the bottle, leave no doubt, I think, that it was, as he concludes, broken off from the articular surface of the patella by the severe wrench which he describes. Possibly it was broken off by a violent wrench against the margin of the femoral condyle, and the St. Thomas's specimen may have been due to the same cause. At any rate, it must be admitted that these are two instances of the production of loose bodies in the joints by accident.

Weichselbaum³ goes into this question, and gives the account of the elbow-joints of a strong male subject, aged 20, in each of which was a loose body, occupying a vacancy in the part of the articulating margin of the head of the radius which plays in the lesser sigmoid cavity of the ulna. The form and adaptation of these to the vacancies in the two radii, and the absence of other disease, leads him to the conclusion that they were the result of fracture. In what manner symmetrical fractures in those particular situations could occur, he does not suggest, and it is not easy to conjecture. It is further to be observed that each of these bodies was more than large enough to fill the vacancy in the head of the radius, and was composed of hyaline cartilage, fibro-cartilage, calcified cartilage, and bone, and that the thickness of the cartilage exceeds that of the head of the radius. These points he endeavours, but insufficiently, to make tally with the supposition that the bodies had been broken off from the bones, in the hollows of which they were placed. It is quite as probable that these were congenital as that they were separated by fracture. Is it not more probable that they were the result of disease? In two nearly symmetrically rheumatoid elbows in the College of Surgeons (1,928-9), besides other bodies which were nearly loose, but attached—one in front and one behind the joint—there appears to be a body in the retiring angle in front of the radio-ulnar joint on each side. The coronoid process also looks as if it had been truncated by the presence of one of the bodies which, if it had been solitary, might have been supposed to have been broken off from it.

The occurrence of loose cartilages in the corresponding joints of the two sides has been observed in several cases, and I need scarcely say that such symmetrical occurrence is scarcely compatible with their being the result of injury.

Mr. G. A. Syme⁴ removed a loose body from the right elbow-joint of a man aged 22. Five years previously there was a slight wrench of the joint, followed by pain and swelling, which subsided, and he felt no further inconvenience for three years, when, "while holding up the shafts of a heavy dray, it overbalanced and he was thrown violently to the ground on his back. He retained his hold of the shaft with his right hand, and, keeping it supported off the ground, felt a strong 'jar' in the right elbow which rested on the ground. The joint became very painful, and he found he could neither straighten nor fully bend the arm; and, when he did attempt to straighten the arm, a 'lump' appeared on the outer side of the joint, but disappeared on his touching it." Efforts to keep the lump in place failed; the use of the arm was in great measure lost. Mr. Syme accordingly removed it. He says: "From the history given of the previous inflammation in the joint and the nature of the accident, I thought that the body was probably an hypertrophied fringe of synovial membrane that had become pendulous and then been detached by the accident;" and the account he gives of the specimen certainly does

not seem to justify his departure from that very probable view, for, although "it consists of true bone covered on its (presumably) upper and outer surfaces by articular cartilage," which appearance, I have shown, is not uncommon in loose cartilages formed in the ordinary way, yet "on the other surface (presumably the line of fracture) it is covered by fibrous tissue"—a condition much more indicative of loose cartilage than of a fragment of articular surface detached by accident. The size and shape of the body are not given, nor the extent to which the cartilage surrounds the bone, which, be it remarked, is stated to have "an areolar appearance, as if recently ossified."

With regard to NECROSIS as a cause of loose bodies such as I am discussing, I must confess that the process of exfoliation, or "quiet necrosis," as it has been designated by Sir James Paget, was not in my mind when I wrote (March 17th), and is not mentioned in the work to which I have referred. This, no doubt, sometimes occurs in bones, a portion dying and being slowly detached beneath the periosteum with little or no suppuration. A good instance is furnished by the bone of a calf in the Cambridge Museum, on the shaft of which is a broad, raised, sharply-defined table of bone; and, on making a section, I found a loose sequestal scale, half an inch in diameter, lying in a completely-closed cavity; but it requires rather more evidence than we yet have that, in an otherwise healthy joint, a portion of bone and cartilage, presenting to the naked eye and under the microscope quite a natural appearance, has been the seat of necrosis, and has in consequence been separated. Surely the death—the necrosis, however quiet—of a portion of articular cartilage and bone must leave some structural traces of the process by which that death was brought about, and which attended upon it; and a necrotic piece of bone and cartilage could scarcely present the perfectly normal character which the loose bodies supposed to have been thus detached are said to have had.

Still I could not help feeling that the very remarkable and interesting case given by the late Mr. Teale in vol. xxxix of the *Medico-Chirurgical Transactions*, and quoted at length by Mr. Howard Marsh, did seem to justify this view. My good friend Mr. Teale has, however, kindly sent me the specimen from the Leeds Museum for examination. I find that the loose body does, as described, present very much the appearance of a portion of articular cartilage and bone, and is nearly adapted to the space in the condyle of the femur from which it is supposed to have been detached by some necrotic process. On the other hand, it was situated on the under and outer part of the internal condyle, a very sheltered spot, where a blow even from a beer barrel could scarcely cause the change in question. Secondly, the cavity in which the loose body lay is at one part continuous with the intercondyloid fossa, a situation in which synovial growths have a tendency to form and to work their way into the surfaces of the condyles, especially that of the internal condyle. Thirdly, the articular margins present—in no very marked degree, it is true—the lipping indicative of rheumatic arthritis, in which disease, we know, synovial growths are very liable to form. Fourthly, the cavity in the condyle occupied by the loose body is smooth, slightly uneven, with a well-defined edge of cartilage, and presents no indication whatever of ulcerative or other process by which the loose body can have been detached, but rather that of absorption from pressure. Fifthly, at the circumference of the loose body the cartilage is projected into a flail-like edge, and above this edge it extends, with a smooth contour, upon the upper or applied surface of the body, where it gradually fades and is partially continuous with the cartilaginous nodules next to be mentioned. Lastly, the upper or deeper surface of the loose body—that applied against the condyle—is slightly knotty or tuberculated; and these tubercles are found, on microscopical examination, to be composed of true cartilage, which is continuous with the cartilage of which the body is composed. In this cartilage calcification has taken place at parts, but no trace of bone is to be found. These features, especially those last mentioned,⁵ seem to preclude the possibility of this body having been detached from the articular surface by necrotic process or in any other way, in spite of the peculiar circumstances which favour the view taken by Mr. Teale and others, and to accord, on the whole, best with the supposition that the body was an outgrowth from the synovial membrane, which gradually formed for itself the cavity so nicely adapted to it. The same remark must, I think, apply to

³ Zur Genesis der Gelenkkörper, Virchow's Archiv, lvi, 121.

⁴ Australian Medical Journal, July 15th, 1888.

⁵ The flail-like edge of this body and the tuberculated character of its applied surface, with the border of cartilage remaining upon that surface, are fairly represented in the figure at p. 788 of this JOURNAL for April 14th.

the layer of fibrous tissue found in the corresponding situation on each of the symmetrical bodies removed from the otherwise healthy knee-joints of a young man by Mr. Holden, quoted by Mr. Howard Marsh.⁶ It can scarcely be supposed that this tissue would have been formed upon a surface separated by necrosis from the articular end of a bone. This remarkable case is to some extent paralleled and probably elucidated by that reported in the *American Journal of Medical Sciences*, October, 1848, in which two oval flat bodies weighing, one 283 grains, and the other 257 grains, and measuring $2\frac{1}{8}$ inches by $1\frac{1}{8}$ and $\frac{3}{4}$ in thickness, and the other $2\frac{3}{4}$ inches by $1\frac{1}{8}$ and $\frac{3}{4}$ in thickness, were removed from the knees of a man, aged 43, who recovered from the operations and was able to walk with perfect ease. That these bodies were of synovial origin is rendered probable from the statement that he had swelling and severe pain in the knees when he was 17; and three years afterwards he found a movable body just above the right patella, and, after a short interval, a similar body in the left knee. A cast of these bodies in the College of Surgeons' Museum shows them to have been uneven on the surface.

In the case carefully described and figured by Klein,⁷ where two bodies, each composed of a layer of cartilage and a layer of bone, occupied a fossa in the outer part of the internal condyle of the femur, the idea of their having been separated from the articular surface is negatived, first, by there being two bodies; secondly, by one of the bodies still retaining its connection with the synovial membrane, thus indicating its origin; and, thirdly, by the cartilaginous coverings extending over the smooth edges of the loose bodies, upon their applied surfaces beyond the deeper level of the surrounding articular cartilage. This last point—the extension of the cartilaginous covering in a smooth manner over the edge of the loose body on to its applied surface, between that surface and the bony surface of the cavity of the condyle—may, I think, be taken as a proof, in any case, that the loose body has not been separated from the articular surface either by necrosis or direct force, but that it has been formed independently, and that, by friction and pressure upon the condyle, it has rubbed a cavity in it, and has been more or less completely deprived of its cartilaginous covering on one side. If this test be applied, it will, I think, be found to indicate the improbability of detachment by necrosis in most, if not all, of the instances with regard to which that view has been entertained. It does so in the cases just mentioned, as well as in the second case represented by Mr. Teale in the *JOURNAL*, May, 26th, p. 1109 (which specimen I have had the opportunity of seeing), where there were two loose bodies, one of which retains attachment to synovial membrane; and another loose body in the same specimen shows well the usual effects of rubbing on one side. It does so in the instance represented by Cruveilhier,⁸ and often quoted as an example of a loose body detached from the articular surface. It does so, as far as I can judge, in the case of the loose body (No. 947 or 647) in the College of Surgeons, referred to by Mr. Howard Marsh, which also looks as if there were some remnants of cartilage upon its bony, or applied, surface. In the specimen in St. George's Museum (III, 140), which has been elsewhere referred to, the loose body is not apparent; but the cavity which it occupied in the condyle is in the situation into which, as I have before said, bodies formed into the adjacent part of the synovial membrane are liable to intrude themselves.

Mr. Bernard Pitts showed me a specimen in St. Thomas's Museum, in which from the under part of a condyle of the femur, in each of two knee-joints of the same person, a flake of cartilage, about a quarter of an inch in diameter, appears to be in process of separation, and its flocculent deeper surface is still connected by threads to the fossa in the cartilage from which it is being detached. The patient was under 30, but the effects of rheumatic arthritis are shown in the extension of the articular margin, and in a slight villosity of the synovial membrane, also in fibrous or velvety degeneration of the articular cartilages, especially in the neighbourhood of one of the separating fragments; and it seems probable that the separation of these fragments was being brought about by a modification of that change in the cartilages which is so common in rheumatoid disease. This view derives confirmation from the presence of cartilaginous bodies, such as I have mentioned, in the synovial membrane. In what number these existed,

and whether any of them were pendulous in the joint, is not now apparent.

The conclusions, then, at which I arrive are:

First: Although I am not aware of any instance in which a portion of articular has been detached by a blow, yet in two cases (Simon's and Teale's) this appears to have resulted from a violent wrench. In each case the loose body so formed was removed by operation.

Secondly: In none of the instances that I have read of, in which the formation of a loose body has been attributed to necrosis, does the evidence of such process appear to me to be satisfactory. The resemblance in structure of certain of these bodies to articular bone and cartilage as an argument in favour of that view, and it was perhaps the strongest, is, in a great measure, set aside by the discovery that this resemblance exists, also, in loose bodies formed in the ordinary way, namely, by synovial outgrowth; these being found in microscopical characters and general features much to resemble portions of articular bone and cartilage. They may, however, be distinguished by one or more of the following features. 1. The presence in greater or less amount of fibro-cartilaginous or fibroid, as well as cartilaginous tissue in the body. 2. The imperfect denudation of the bone upon the rubbed down, or applied, surface of the body, so that remnants of cartilaginous or fibro-cartilaginous or fibroid tissue are found there. 3. The varying thickness of the cartilaginous covering, which in some parts may exceed that of normal articular cartilage, and its extension over the rounded edge of the body, to a greater or less extent, upon the circumference of its applied surface. 4. The knotty outline of the osseous nucleus and the imperfection of its bone-formation. 5. The size of the loose body being greater than that of the cavity in the condyles, so that it rises above the level of the surrounding articular cartilage. The presence of any one of these features renders a derivation from the articular surface very improbable; and the combination of two or more of them renders it almost impossible.

THE TREATMENT OF PHARYNGEAL CATARRH.

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ACUTE catarrh of the naso-pharynx is usually associated with a similar condition in the nose or lower pharynx, and therefore the general treatment will be the same as for the latter, though local treatment for the space is indicated. The most prominent symptoms to be alleviated are increased secretion, which is exceedingly troublesome, especially at night, preventing sleep from dropping down into the pharynx; ear complications, if they exist; and, from swelling and hypersecretion, more or less obstruction to the breathing, especially so if the nose be implicated. The troublesome secretion may be conveniently removed with a tepid three-quarter per cent. solution of common salt, ammonium chloride, or sodium bicarbonate, or with a 2 to 4 per cent. solution of borax or boracic acid injected through the nose with a two or three ounce india-rubber ball-syringe. The head is held slightly backwards, the ball-syringe gently compressed, and, when the patient feels the fluid at the back of the nose, he throws his head forwards and allows it to run out at both nostrils. In the same manner the solution may be poured from a spoon or other suitable vessel. If the head be held forwards, the syringe must be more firmly compressed, in order to force the fluid through and out at the other nostril. After syringing, the nose should not be blown for at least a quarter of an hour, to avoid the risk of the fluid being driven into the ear and setting up inflammation.

Another method, which I introduced some time ago, and from which I have obtained good results, is the employment of a solution of from 15 to 20 per cent. of menthol in olive oil. This fluid is poured from a spoon or injected with a fine syringe through each nostril, the head being held well back, so that the fluid passes into the back of the throat and bathes the pharynx. Half a drachm of a 20 per cent. solution, injected through each nostril, is the amount I generally employ. Besides exerting an anti-catarrhal and anæsthetic effect, menthol has the power of stopping a purulent or muco-purulent secretion. The flow of watery mucus which is induced washes out the muco-purulent secretion, the use of the pocket-handkerchief therefore being necessitated

⁶ *St. Bartholomew's Hospital Reports*, vol. iv, p. 256; and this *JOURNAL*, April 14th.

⁷ *Virchow's Archiv*, xxix, 190.

⁸ *Anatomie Pathologique*, livraison 9, Pl. 6, Fig. 3, and copied by Bardeleben, *Chirurgie*, ii, 637, Fig. 87.