chylosis, a tendency which you must combat by exciting or favouring resolution, and preventing adhesion.

IV. *Therapeutical indications.*—They result from what precedes, and belong to three periods of the disease. In the first, that of the beginning, the intensity of the phlegmasia must be opposed by rest in a good position, antiphlogistics (leeches, cupping) derivatives upon the intestinal canal, narcotics to quiet pain.

In the second, you must try to provoke and aid the absorption of the plastic products. It is still rest and immobility which meet this indication; revulsives upon the skin, blisters, punctate cauterization may also aid it.

In the third, you must try to make the adhesions, which are still thought to be soft, and the rigidity, which is not yet invincible, yield. It is then that it is proper to try massage and communicated movements. But here we find ourselves between two dangers: that of provoking, by these movements, a return of the phlegmasia, and that, by not employing them, of allowing the anchylosis to form. We are obliged to feel our way. If the manœuvres cause only temporary pain it is proper to persevere; if, on the contrary, they provoke continuous pain, with return of the swelling, of the articular effusion, and of heat to the touch, they must be stopped. Perhaps a little later they may be borne; if they are not it is best to abstain entirely and to abandon the arthritis to the chances of anchylosis, as we have had to do for our two patients. At this same period if the articulation has become indolent enough to allow the patient to leave his bed and walk on crutches, baths and douches of sulphurous or thermal waters, such as those of Néris, Bourbonne, and Plombières, would also be very useful.

LECTURE XXXVI.

CHRONIC ARTHRITES OF THE KNEE.—HYDRARTHROSIS.

Dropsical arthritis or hydrarthrosis—Lesions supposed to exist, but inappreciable by physical signs—Probable congestive form—Enlargement of the patella, explained by a hypertrophying osteitis—Prognosis—Long duration, possible relapse—No tendency to suppuration and to anchylosis—Therapeutical indications: 1st curative treatment: compression, blisters, puncture, actual cautery, injection of iodine; 2d prophylactic treatment.

Gentlemen: We have at this moment in the wards several patients suffering from chronic affections of the knee. When passing their beds every morning, I indicate by a word what there is that is characteristic in each one of them, and I recall to you the questions which should always preoccupy us when in presence of affections of this kind: shall we have resolution, anchylosis, suppuration, or the infirmity of dry arthritis? I cannot speak to you of all these patients: I shall take only the three principal types: hydrarthrosis, white swelling, and dry arthritis. I begin with the hydrarthrosis.

Dropsical arthritis or hydrarthrosis.—The patient in No. 20 is a man thirty years old, jeweller, of a medium constitution, but in whose antecedents we find no indications of scrofula. He told us that on several occasions he had pains in the shoulders, arm, and left knee, which however have never been swollen. These pains, although apparently rheumatic, had not been accompanied by fever nor by such an alteration of health that we could explain them by an acute articular rheumatism.

He entered our wards for the first time three years ago for a swelling in the right knee, the cause of which was unknown. He remained six weeks, and left us almost cured, with a rubber knee-cap, which we advised him to wear during the day and to remove at night. He was able to resume work and continue it until a month ago. However, he has always felt at times, especially when a little fatigued and when the weather was damp, pains in this knee. Finally, a month and a half ago, after a long walk, the pain became more intense, more prolonged, a new swelling appeared, and the patient was obliged to return to us.

He has been here four weeks. You noticed at first that the right knee was swollen, that the depressions on each side of the patella were replaced by a tumefaction appreciable by the eye, that the region was not hot to the hand, and that, by pressing with both hands upon the sides, while the index finger of the right hand pressed back the patella, fluctuation was distinctly felt. There was further the sensation that the liquid was not separated from the skin by a thick layer, and on examining the prolongations of the synovial cavity, especially the upper one, we did not feel any thickening.

The diagnosis was not difficult; first, it was certainly an arthritis, since the swelling, the pain, the difficulty in movement, the heat from time to time could be attributed neither to a simple neuralgia,[1] nor to a cancer, nor to any other disease. But we had next to make the anatomical and the etiological diagnosis of this arthritis.

As to the first, the thing was evident; it was certainly a chronic arthritis, but with considerable effusion, so considerable that it was allowable to make use of it to characterize the disease as our authors have done by employing the word *hydrarthrosis.* You have often heard me pronounce this word for the present patient, and for those who have been similarly affected. But I prefer generally the name *dropsical arthritis* or *arthritis with effusion*, because under this name of hydrarthrosis are comprised two things: an essential effusion or one without lesion, like that which is formed during anasarca, and an

[1] I have often spoken of patients who, with out any anterior disease, or after a traumatic or a rheumatic arthritis, had a very sharp continuous pain in the side of the knee, with exacerbation during walking or without known cause, and without any appreciable swelling. The arthritis had no lesion, or only a congestion inappreciable by our senses; but it was more painful than this simple lesion would have made one suppose. I call it neuralgic arthritis or exaggerated sensibility of the knee.

effusion symptomatic of an inflammatory condition. Now, although we have not often had occasion to make the autopsy of patients dead with hydrarthrosis, yet, in the rare cases where this occasion has been presented, an injection of the synovial membrane has been found, representing Bonnet's congestive form, of which I have already spoken, with a very slight thickening; and as in the other side, the clinic teaches us that most patients affected with effusion in a single knee have at the same time some functional symptoms which can be explained by inflammation, I prefer to make use of the word arthritis, which indicates that in my opinion it is an inflammatory disease.

I sought, in our patient, if there was at the outer and upper part of the articulation one of those indurated nodules which Marjolin and Malgaigne pointed out as sometimes accompanying hydrarthrosis, which may be attributed to a partial thickening of the synovial membrane. But I did not find these nodules, although I have found them upon other subjects.

I have just touched upon another point of the anatomical diagnosis. What are the lessons of this arthritis with effusion? I assure you that the clinic has given no physical sign which could indicate any. If these lesions exist, and I do not doubt it, they ought to be in the synovial membrane, for that is the only way of understanding the effusion. But it does not seem to be thickened, neither as it is in plastic arthritis, nor as it is in fungoid arthritis. I do not deny a slight augmentation of volume like that which sometimes accompanies congestion. I am disposed especially to admit this augmentation in the synovial fringes corresponding to the intercondyloid space; but the lesion is not sufficiently marked to be felt through the skin. I believe much more in the existence of injection or hyperæmia like that which was found in the autopsies of Dupuytren and others, and I believe it, not because it is proved to me by physical signs, but because the effusion and the functional symptoms are those of an arthritis, and because I do not know any other lesion than congestion or hyperæmia which could explain them.

But what must we think of the other constitutent parts of the articulation? I admit that I fear some nutritive trouble in the cartilages; for there is such a solidarity between them and the synovial membrane, that they end habitually by becoming altered when the other has been diseased for some time. Still, there is as yet no physical sign which authorizes me to affirm the existence of a lesion in that quarter. The same is true of the ligaments; if they were softened, and they sometimes are in hydrarthrosis either by excessive distension, or, which seems to me more common, by a concomitant trouble of nutrition, we should have lateral mobility; but I satisfied myself that it did not exist. Moreover, they are not rigid, for all communicated movements are executed almost as they are normally. Voluntary movements also take place, but they are limited by the pain and not by an appreciable material modification of the means of union.

As to the bones, I have noticed nothing in the femur and tibia; the first, in particular, has not shown that hyperostosic swelling with which we were struck in certain plastic arthrites (see p. 295). I

point out to you only a very marked transverse enlargement of the patella. We measured it with a compass, and found it nearly half an inch larger than that of the opposite side. This enlargement of the patella in hydrarthrosis was pointed out long ago; but its origin and its signification were not explained. For me, its origin is still in an hypertrophying osteitis, of the kind of which I have so often spoken to you. Instead of affecting the femur and tibia in a manner appreciable during life, this osteitis is confined to the patella, a peculiarity which is utterly inexplicable. Its signification, however, appears to me to be the same as that of femoral hyperostosis in other arthrites, that is to say, since condensing osteitis appears habitually in patients who are not scrofulous and consequently not predisposed to fungoid and suppurating arthritis, the appearance of hyperostosis of the patella would be a reason to dismiss any fear of the occurrence of the latter, even if some physical signs should have given rise to it.

To recapitulate, gentlemen: in making the diagnosis, *dropsical arthritis*, I presume that we have to deal especially with a rebellious hyperæmia or congestion of the synovial membrane, and if I do not use the expression congestive arthritis, it is because this expression does not sufficiently indicate one of the principal things, the abundance of the liquid. And as congestive arthritis may take place without effusion, and as the latter, when it does exist, has a bearing upon the prognosis and treatment, it is better to use an expression which indicates its presence.

As for the etiological diagnosis, I told you a moment ago that it is a rheumatic disease. At least, we can give no other explanation than that. It is an insoluble problem, that of knowing why this same general cause is marked by effects which are so varied, sometimes a plastic arthritis without much effusion, sometimes a simple congestive arthritis, sometimes a congestive arthritis with effusion, and at other times, as you will see, the dry form. But we have nothing better to substitute for this etiology, and we must keep it because it indicates the use of certain curative and prophylactic measures.

Prognosis.—What preoccupies me above all in this patient, is the probability that his affection will last a long time, and the possibility of a relapse after it has been cured. I have but little fear of its terminating by suppuration, because hydrarthrosis, when not symptomatic of a fungoid synovitis, almost never ends this way. Nor do I fear complete anchylosis, because exudations and false membranes do not exist, or exist in too small quantity to bring about this result. Moreover, even if there were false membranes disposed to form adhesions, the interposed liquid would prevent it. If anchylosis should hereafter occur, it would be incomplete and due to rigidity of the synovial membrane following a slight thickening which may now exist, although the physical signs do not clearly show it. But it is probable that such an anchylosis would be temporary, and that resolution would be obtained. It is possible that, if the disease resists our treatment or reappears a certain number of times, dry arthritis may be substituted for the dropsical one. For it is difficult for the phlegmasia to continue without extending from the synovial membrane to the cartilages.

Alteration of the latter leads sooner or later to their destruction, and when they are once destroyed, if the articulation does not become anchylosed, it is inevitably destined to dry arthritis.

Treatment.—We must distinguish between the curative and the prophylactic treatment.

1st. *Curative treatment.*—Two indications are to be met: to get rid of the synovial congestion, and to get rid of the effusion.

The first needs absolute rest in the horizontal posture; to that we have added since the beginning elastic compression by means of the cotton batting dressing. At the end of a week, not having obtained any diminution, we applied two blisters, and four days later, two others. We interrupted the compression the day the blisters were applied, and renewed it as soon as the epidermis had been opened. Only one purge has been given.

These measures have been sufficient in a certain number of cases, and seemed to act at the same time against the congestion, the starting point of the disease, and against the effusion. The patients were able to leave us at the end of five or six weeks, walking quite freely, and having no longer any swelling or fluctuation. In others we needed from six to eight weeks, at the end of which the cure, although temporary, was obtained. In others again, pain on motion no longer existed at the end of this time; the effusion was diminished, but was still quite large. As confinement to the bed fatigued and weakened the patients, I let them get up and walk with crutches, on the condition of always keeping the cotton dressing applied to the foot, leg, and lower half of the thigh. Sometimes I wrapped a band of vulcanized rubber about the outer bandage so as to insure compression.

In this case, after confinement to the bed for four weeks, blisters, and compression, although the sensibility seemed to be diminished, we still found considerable effusion. It is then one of the cases in which we have to turn to the second indication, address ourselves to the effusion itself. I met this indication this morning at the bedside of the patient. I punctured with a very fine trocar and withdrew the liquid by means of an aspirating syringe, making it flow into a vessel in which a vacuum had been made before the faucet communicating with the canula of the trocar had been opened. You saw that the liquid escaped very freely, and that I avoided making any pressure upon the joint under the pretext of favouring the flow. The evacuation ended, I took care to close the small opening with collodion and to replace the cotton bandage. There were about five ounces of liquid. It was sticky, yellowish, and although it did not offer the troubled or gray tint which indicates the admixture of a certain quantity of pus, yet we found a few lecuocytes in it. Still I am not disturbed by this fact, because normal-synovia always contains a certain number of these elements, and their augmentation after a slight inflammation by no means indicates a tendency to suppuration, as we understand it in surgery.

But after this puncture, and if we continue the compression, will the patient get well? That depends upon the cause, doubtful for me, of the effusion. There is no doubt but that its starting point was an excess of secretion. It then continued because absorption was insufficient. If now the synovial membrane is so happily modified that equilibrium may be re-established between the secretory and absorbing functions, the puncture will succeed. But if it remains vascularized, its secretory function exaggerated, and its absorbing power diminished, the liquid will be reproduced and not absorbed. It is because no symptom can enlighten me on this point that I cannot determine the consequences of our operation.

If the same quantity of liquid is reproduced, what shall we do? Until recently, we rarely punctured the joints, because we feared consecutive suppuration. But now the facts published by M. Dieulafoy, and those that I have myself observed, authorize us to believe that capillary puncture with aspiration does not expose to this danger. Therefore I should be willing to make a second and even a third puncture if, after two new blisters and the continuation of the compression bandage, the liquid was not reabsorbed.

Perhaps also in this case I shall have recourse to actual cautery. Some surgeons claim to have obtained very good results by this operation, the effect of which is to produce a strong revulsion and cause rigid cicatrices which oppose distension by a new effusion.

If, finally, after five or six months of treatment, I should not have succeeded, which I do not think is very probable, I shall allow the patient to walk while wearing the compressive bandage. Perhaps a little later, and I have seen examples of it, the effusion will end by disappearing and not being reproduced, leaving the articulation its shape and functions.

Perhaps also, the cartilages having disappeared and the synovial membrane having become rigid, the hydrarthrosis may be transformed into an incurable dry arthritis.

If then, after waiting a few months, the effusion persists, or if after having disappeared once or twice it is reproduced; if, above all, I think I see a tendency towards a termination by dry arthritis, I shall propose an injection of iodine, one-third of the tincture of iodine in two-thirds of distilled water. This operation, which was recommended and performed thirty years ago by Velpeau and Bonnet (de Lyon), is now rarely practised. I have employed it only twice. Why this disfavour? Because the injection is followed by a very acute arthritis. In some cases, notably in one of Velpeau's, and in one of Aug. Bérard's of which I was a witness, this arthritis ended in suppuration, purulent infection, and death. In other cases, and this is what happened in my two patients, the arthritis thus provoked remained plastic and ended in complete anchylosis. I believe we cannot count upon a better result, especially upon the substitution for the dropsical arthritis of an arthritis capable of terminating by perfect resolution with preservation of movements, and it is because we cannot count upon this that we should not make haste to advise the injection of iodine. I should however advise it if the relaxation of the ligaments and commencing crepitation made me foresee dry arthritis, for the provocation of an acute arthritis is less to be regretted. I think indeed that with

care, and especially by means of immobility and proper compression, suppuration could probably be prevented.

2d. *Prophylactic treatment.*—If we obtain, as I hope, resolution of the effusion and of the congestive arthritis, there will be two indications to meet. The first is that of combating the rheumatic cause, by advising the patient to occupy a dry room which faces the south; to avoid getting chilled, to wear flannel, and to pass, if possible, one or two seasons at one of the thermal springs which I have already mentioned, in short the advice which we usually give rheumatic patients. The second is that of maintaining constantly, while walking or standing, a certain compression upon the knee by means of a laced dog-skin or canvas knee-cap. These appliances are often troublesome bacause they are too tight, or useless because not tight enough. Careful and intelligent patients find it better to wear a flannel band two and a half inches wide and about three yards long, which they apply tightly enough to make the necessary compression without being thereby incommoded.

LECTURE XXXVII.

CHRONIC ARTHRITES OF THE KNEE, CONTINUED.—FUNGOID ARTHRITIS OR WHITE SWELLING.

Non-suppurative white swelling of the left knee in a young man 20 years old—Physical and functional symptoms—Muscular atrophy—Absence of hyperostosis—Increase of local heat—Anatomical diagnosis—Undoubted fungoid transformation of the synovial membrane and the ligaments—Presumed lesions of the diarthrodial cartilages and the ligaments—Rarefying osteitis or simple rarefaction, and fatty condition of the cancellous tissue—Etiological diagnosis—Course, termination, and prognosis; tendency to suppuration; very little tendency to anchylosis—Treatment—Indication to favour anchylosis—Cotton batting apparatus, immovable fenestrated apparatus—General treatment.

GENTLEMEN: The patient who was admitted yesterday, No. 4, ward Sainte Vierge, and who resembles two others who have been here for several months, is a young man 20 years old, a shoemaker, who says his left knee has been affected for about a year. As it caused him no pain, and only a little difficulty in moving, he has thus far done nothing for it. But a week ago, after having walked the day before a little more than usual, he suffered pain, was unable to walk, and was obliged to enter the hospital.

You are at first struck with his puny look. He is small, beardless, pale, and with thin muscles. We find the scars of no abscesses on the neck, but he told us that his childhood had been sickly, and that several times his eyes had been inflamed and there had been a discharge from his ears. Although he has had no hæmoptysis he is

subject to colds. His father is still living, but he thinks his mother died of some disease of the chest. He has two sisters who, he says, are pretty well, but he has lost two brothers, one in infancy, the other at the age of 18. In short, his constitution is lymphatic, his antecedents and those of his family show a predisposition to tuberculization.

As for his knee, it presents physical symptoms and functional symptoms.

Physical symptoms.—The knee is completely extended, uniformly swollen, rounded; the lateral depressions on each side of the patella are effaced. Placing the fingers on the outer side, a little above the superior tibio-fibular articulation, I feel a lobe a little distinct from the rest. The swelling is flabby; at certain points it yields a sensation similar to fluctuation. But, if grasping with both hands the lateral portions of the knee, I press the patella backwards with my forefinger, I find that it remains immovable, that it is not pushed towards the condyles of the femur, as it is in hydrarthrosis, and that the fingers placed upon the sides are not raised by the liquid. If we seek fluctuation by placing two fingers on the outer and two on the inner side, we do not find it. There is then no liquid in the synovial cavity; or if there is any it is not abundant enough to give fluctuation. The sensation of this kind which is felt here and there superficially is not furnished by an intra-articular liquid. It is not resistent and not elastic, and is caused rather by very soft tissues than by a collection of liquid. For more certainty I pricked two of these soft points with a pin, and saw no liquid flow except a little blood which evidently came from the prick. When we compare the two thighs we are struck with the difference in their size. The muscles of the left one are evidently atrophied; so too are those of the calf of the leg, but to a little less degree. This atrophy, which is constant after articular diseases of long duration, seems to me to be due, like that which we find after fractures (page 71), to the irregular distribution of the nutritive material between the synovial membrane which uses more and the muscles which receive less. I felt deeply to see if the femur was swollen, it did not seem to be, and, indeed, we have here a chronic disease, in a feeble patient, whose constitution, as I have already told you, does not predispose to general or very extensive hypertrophying osteitis.

As functional symptoms. I showed you an elevation of temperature, easily recognized by placing the palm of the hand alternately upon the two knees. I did not make an examination here with the thermometer, but I have done so upon others who showed the same difference of temperature, and found from two to five and a half degrees (Fahr.) of difference. When at rest, the articulation is not constantly painful; but you heard the patient say that he often felt, especially at night, shooting and throbbing pains, and, like most patients who suffer in the knee, he indicated the inner side as the principal seat of the pains. When asked to flex and extend the articulation, he was unable to do it on account of the pain. I then myself communicated these movements and showed that they were possible; I further found abnormal lateral movements, without crepitation. No general symp-