ART. XXIII.—*Observations on Periostitis, Synovitis, &c.* By
EPHRAIM M'DOWEL, M. D. M. R. I. A., one of the Surgeons
of the Richmond Surgical Hospital, Dublin.

THE profession is greatly indebted to Mr. Brodie for his work on diseases of the joints. His classification is much more natural and scientific, and his treatment much more successful, than any that we previously possessed. But I hope to be able to communicate some further information on a form of one of these diseases, and to which he has not directed our attention ; I mean synovitis, connected more or less with periostitis.

Inflammation of the synovial membranes, not arising from injury, is well known to be frequently very acute, to run to a great height, and to cause so much constitutional disturbance, as frequently to endanger life. In the sixth case given by Mr. Brodie, we have an example of arachnitis occurring on the sudden disappearance of synovitis of the knee joint ; and his tenth and eleventh cases shew the fatal constitutional disturbance that may succeed to ulceration of even a small portion of the synovial membrane. But I shall now endeavour to shew that there are other peculiarities attendant on this affection which deserve to be noticed. Since January, 1831, I have met with several cases of acute synovitis combined with inflammation of the periosteum, to a greater or less extent, attacking different articulations with great rapidity, and causing death, in several instances, apparently by exciting pulmonary or cerebral inflammation, the affections of the periosteum and joints remaining throughout undiminished. I shall therefore endeavour to convey as clearly as possible, a knowledge of the facts as they presented themselves.

The disease did not shift from one joint to another, but continued in the articulation first affected, when another was subsequently engaged. In the cases where the periosteum was implicated, the inflammation was obviously extended to it from

the joint in which it first commenced. The affection must be more common than is generally supposed, as, within the last two years, nine examples of it have come under my observation. It is one of great severity, and runs its course to a fatal termination, in too many instances, apparently uninfluenced by the treatment ordinarily adopted in cases of inflammation of the joints, or of the fibrous structures. In every instance it was accompanied by a train of symptoms so marked, as at once to declare its nature. It occurred with and without injury, and may therefore be considered as either idiopathic or symptomatic. Its subjects were invariably young, being from ten to twenty-two years of age. In several instances they had been exposed to severe cold, and engaged in labour beyond their strength. In one instance, it was suddenly developed on the disappearance of the eruption of scarlatina maligna; there had been much cerebral excitement, and extensive inflammation, and sloughing of the mucous membrane of the fauces. On the twelfth day from the commencement of the disease, sudden pain and swelling of the right wrist joint occurred, and, in a few hours, fluctuation was evident, accompanied by considerable symptomatic fever. On the following day the left ankle joint was suddenly and similarly affected. There was almost constant screaming, till a few hours before death, which occurred on the third day from the attack of synovitis, and with symptoms indicating effusion within the cranium. And, in the ninth case to be related, synovitis of the left hip joint suddenly succeeded to acute inflammation of the fascia of the right leg. The rapidity with which the disease passed through its different stages was so various, as to occupy, in one instance, but the short period of fifty hours, and, in the others, from four to eleven days.

The local symptoms were characterized by an intensely severe pain, aggravated by the slightest pressure or movement of the affected limb, and causing frequent screaming. The tension and swelling were so considerable, that, when incisions were made to give exit to fluid supposed to exist, the divided

surfaces retracted considerably, and the swollen muscles protruded. When the inflammation was situated in the deep-seated joints, there was no discoloration of the skin, but the veins were numerous and turgid ; if the articulation was superficial, as the ankle, or when the periosteum of a bone situated near the surface was engaged, redness of the integuments occurred early, ending, as in erysipelas, abruptly. In one very acute case, roscola and urticaria were superinduced ; and, in another, a large gangrenous-looking vesicle developed itself on the inflamed surface.

The symptomatic fever was, in every instance, violent, and characterized by great depression, by a countenance anxious, flushed, and depictive of great suffering ; by moaning or screaming in a very peculiar tone, headach, restlessness, insomnia, and by more or less of delirium. In the case of a young girl, with diffused periostitis of the tibia, hydrocephalic symptoms set in three days before death, and she died in convulsions. The respiration, in every case, was short and hurried, with a slight cough, and frequently with a mucous or sonorous rle. The pulse was always rapid, varying from 100 to 180, and generally feeble. The tongue was loaded, frequently dry, and brown or red at the tip and edges, with insatiable thirst. There were frequent bilious vomiting, tenderness and fulness of the epigastrium, and always constipation, and high coloured and scanty urine. The constitutional symptoms, viewed in connexion with the local, bearing, in fact, a striking resemblance to those accompanying inflammation of the lining membrane of veins.

The morbid appearances were, in some instances, vascularity and thickening of the synovial membrane ; in others, fluid was found, with little or no change in the synovial sac. The contained matter was either healthy looking pus, or a thin, brownish red fluid, with portions of lymph. There was found ulceration of the articular capsule, and also thickening, vascularity, and, frequently, extensive detachment of the periosteum from the bone, which usually presented a peculiarly pinkish red

colour. In one case, the periosteum, for a considerable extent, was coated with a reticulated lymph, resembling that so frequently seen in pericarditis. On cutting down to the bone, purulent infiltration of the cellular tissue of the muscles was occasionally found, the muscular fibres being of a very deep red colour, and no communication existing between the matter in the muscles, and that found between the bone and its periosteum. This matter varied in its appearance, and often resembled perfectly healthy pus. In one instance, in particular, matter flowed from the femoral vein on its being divided. In the majority of the cases which I have had an opportunity of examining after death, but few morbid appearances were found within the cranium, and these consisted in effusion of a small quantity of serous fluid into the ventricles and the arachnoid sac. The brain was either soft and watery, or very firm; the pia mater was more vascular than natural, and its redness was either diffused or in patches. In one of the cases to be detailed, it will be seen that periostitis of the orbit terminated by inflammation, and suppuration of the dura mater, the arachnoid sac, and the substance of the brain. In the cavity of the thorax, morbid appearances were much more generally met with than in any other, and they may be described as consisting in recent inflammation of the pleura, with adhesions, the lymph occasionally deposited on the surface in considerable quantity, and reticulated; congestion of, and numerous small abscesses in, the lungs, more or less contiguous to the surface, containing a perfect or an imperfectly formed purulent secretion, and combined with the first stage of hepatization, and with bronchitis.

With respect to the treatment of this affection, I have found that all the remedial means recommended by authors have failed to such an extent, that only three out of eight cases terminated favourably. It should be remarked, however, that the greater number of fatal cases had been so far advanced, on admission into hospital, that the internal organs were seriously, if not irremediably, engaged. But, upon the whole, such experience as

I have had in the treatment of this disease, leads me to place more reliance upon the following plan than any other that I am acquainted with, viz., early and active depletion, early and free division of the periosteum, the introduction of mercury, so as to bring the system rapidly under its influence ; and, lastly, the energetic employment of means to support the patient during the suppurative stage.

The following was the first case that I paid particular attention to, and was an example of idiopathic synovitis and periostitis :—

Patrick Dodd, ætat. 12, admitted into the Richmond Hospital January 21, 1831. He was unable to give any account of the cause of his illness, but complained of severe pains in different parts of the body, particularly in the *left leg*, which, from the knee to the foot, is red, painful on pressure, enormously swollen and tense, with a deceptive feel of fluctuation. The right hip joint and thigh are also swollen, painful, and very tense, the veins much distended, the countenance pale, sunken, and exhausted, expressive of much suffering and anxiety ; tongue dry and brown ; pulse rapid and very feeble ; complete prostration of strength. The fascia of the leg was divided ; the edges of the incision retracted considerably, and the muscles protruded ; but no purulent matter was discharged. Warm drinks, heat to the feet, an emollient enema, and carbonate of ammonia with camphor mixture.

22nd. Re-action has taken place ; tongue loaded ; much thirst ; the tension of the leg being still very great, two incisions were made through the fascia on its inner side, but without giving exit to pus ; a bolus of calomel, followed in six hours with a draught of castor oil ; poultices and fomentations.

23rd. No sleep ; almost constant moaning and raving ; urine and feces passed involuntarily ; tongue dry and brown ; pulse 140, and feeble. The erysipelatous redness has extended from the left leg far up on the thigh, and is of a much deeper hue than before. The tension of the right thigh has so much

increased, that an incision of considerable length was made along its outer side, the fascia instantly flew open, presenting a sharp hard edge, but no fluid was given exit to; head to be shaved, and cold lotion applied; diaphoretic mixture and saline draughts; leeches to the foot and thigh.

24th. Pulse small, feeble, and rapid; countenance more sunk; stupor; moans and raves without ceasing; erysipelatous redness on the left nates and hip; behind the trochanter, a gangrenous patch has appeared, from which the cuticle has separated, three grains of quinine every fourth hour; blister to the nape of the neck; wine and water. In the evening there was profuse perspiration, and the face became deeply flushed.

25th. No material change in the symptoms; insomnia; moaning, screaming, and raving; countenance more sunk.

26th. Died at four o'clock this day.

Post mortem examination.—Patchy vascularity of the pia mater, substance of the brain firm; a considerable quantity of reticulated lymph effused on the right lung, with corresponding hepatization. Numerous and very small abscesses scattered over both lungs, containing an imperfectly formed pus, and all situated either on or immediately contiguous to the surface. The bronchia contains a large quantity of frothy mucus. Numerous black patches, evidently congested blood, in the substance of the lungs. Hepatization in its first stage existed, corresponding to the deposition of lymph on the surface; abdomen healthy.

On cutting into the right hip joint, the synovial membrane was found inflamed, a quantity of brownish red purulent matter in the joint. Through an ulcerated opening in the capsule, the matter had passed out, separating the muscles from each other, and detaching the periosteum from the upper third of the femur. In the left leg, the periosteum was separated from the entire of the tibia, inflamed, thickened, and reticulated; the synovial membrane of the left ankle was also inflamed, and covered with a secretion similar to that in the right hip joint; the epiphysis

was completely separated from the lower end of the tibia. In slitting up the left femoral vein, a fibrinous clot was found, and a small quantity of purulent matter issued from its cavity.

CASE 2.—Mary Murray, aged 13, was admitted July 16, 1831, into the Richmond Hospital, labouring under much fever; pulse 130, and small; pain and some swelling of the right knee joint, and upper part of the leg; no discoloration of the skin; unable to bear the slightest pressure; has been for some time exposed to great fatigue and hardship, to which she was previously unaccustomed; four days previous to her admission, was attacked suddenly with severe pain in the knee, which soon extended to the leg, and with frequent vomitings. In the course of the day, the tension and swelling increased so much, that the fascia was freely divided above the centre of the leg, a bolus of calomel and jalap, twelve leeches to the leg; stupor and poultice.

18th. Eight o'clock, A. M. Fever continues very high; raved during the night; the swelling has extended down to the ankle, which has become implicated; increased tension; obscure sense of deep fluctuation; a roseolar rash over the whole body; frequent bilious vomitings; insatiable thirst; bowels free; an incision was made down to the tibia a little below the knee, and on dividing the periosteum, a reddish coloured purulent matter was given exit to, in considerable quantity. Effervescing draughts, with tincture of opium, V. S. ad $\frac{3}{4}$ viii.

19th. Delirium during the night; cessation of vomiting; bowels free; eruption nearly vanished; troublesome itching, and great heat of the surface; tongue loaded; excessive thirst; pulse 130; in the course of this day pain in the right side of the chest, increased by a full inspiration; leeches to the ankle; diaphoretic mixture; blister to the right side of the chest.

20th. Restless night; delirium; recurrence of the eruption, which has now assumed more the character of urticaria; swelling and tension of leg and ankle abated; abdominal ten-

derness ; hands and feet cold ; constant moaning ; pulse 160 ; leeches to the epigastrium ; calomel and opium.

21st. Slept two hours, awoke screaming ; great heat of the scalp ; eruption more extended ; patches more elevated ; pulse 150 ; sordes on the gums and teeth ; bowels confined ; leeches to the head ; castor oil draught.

22nd. Continues screaming, tossing of the head ; insomnia ; pulse very rapid ; sunken aspect ; heavy expression of the eyes ; dilated pupils ; involuntary stools.

23rd. Loss of vision, and increased dilatation of the pupils ; frequent screaming, laborious breathing ; mucous rle ; slight convulsions ; consciousness perfect ; death in convulsions. No examination of the body permitted.

CASE 3.—Patrick Keegan, aged 13, admitted 21st of May, 1831, under the care of Dr. Hutton, with pain and swelling of the right arm, extending from the shoulder to the elbow, intolerance of the least motion or pressure ; slight œdema, and much constitutional disturbance ; tongue dry and brown, and its apex red ; eyes heavy, countenance sallow and anxious, severe headach ; nausea ; high coloured and scanty urine ; pulse rapid, and skin very hot ; had an attack of rigor yesterday, followed by hot and sweating stages. It appears that he had enjoyed good health till twelve days since, whence he was suddenly seized with severe pain in the right shoulder, which gradually extended all down the arm. At the end of a week swelling commenced, and the pain became more severe. Diaphoretic mixture with tincture of opium ; emollient enema ; leeches ; saline draughts, and, in the evening, calomel and antimonial powders every fourth hour.

23rd. An incision was made down to the bone at the upper part of the arm, and the periosteum which was found thickened, vascular, and easily separated from the bone, was freely divided. The eighth of a grain of opium added to each pill. In five days afterwards, the pain and swelling had nearly subsided, and he was free from fever, and eventually he recovered.

CASE 4.—Henry Sevan, aged 16, was admitted into the Richmond Surgical Hospital on September 30, 1831. A few days previous to admission, he fell from a height of about fifteen feet on his left side; on admission his countenance was remarkably indicative of severe suffering, he complained of violent pain in the *left hip joint*, tenderness on pressure all over the articulation, particularly anteriorly, the thigh was flexed, and the foot inverted and resting against the opposite limb. In my absence he was ordered a bolus of calomel and jalap. In the evening he complained of severe pain in the right ankle joint, and in a short time, the integuments covering it became inflamed. Symptoms of cerebral excitement now manifested themselves, he was almost constantly raving or screaming, but when spoken to, answered rationally.

October 1st. Raving continues, screaming more violently; skin very hot; pulse rapid and firmer; tongue much loaded with a cream-coloured mucus; insatiable thirst; increased redness and swelling of the ankle; less pain in the hip; cupping behind the trochanter, and twelve ounces blood removed; eighteen leeches to the right ankle; bolus repeated; head shaved and cold lotion applied.

Seven o'clock, evening.—No abatement of the symptoms, redness extending up the leg; constantly screaming; bowels well opened; two grains of calomel and one of Dover's powder every fourth hour.

2nd. No rest last night, incessant screaming; increased redness and swelling of the leg, an incision more than three inches long made down to the bone, and nearly four ounces of healthy pus given exit to, from beneath the periosteum. At twelve o'clock the screaming abated, but he became comatose, and died at nine o'clock in the evening.

Post mortem examination twelve hours after death.—A very vascular connexion between pericranium and bone was found, and a slightly augmented vascularity of the pia mater. The right ankle joint was filled with healthy pus, and from the

articulation upwards four inches of the periosteum were separated from the bone by pus ; the bone was very vascular, the synovial membrane of the ankle joint was thickened and vascular, the cartilages were healthy.

In the left hip joint, there was a collection of purulent matter as in the ankle, and the synovial membrane presented the same diseased appearance.

CASE 5.—*Synovitis and Periostitis from injury.* George Walsh, aged 10, admitted October 15, 1832, into the Richmond Hospital. Eight days before his admission, he fell from a wall about eight feet high on his side and hip, and two days subsequently he was *suddenly* seized with severe pain in the right hip, which confined him to his bed. The pain also extended over the external fossa of the ilium, to the sacro-iliac symphysis. Shortly after admission, he was attacked with sudden and severe pain of the left joint, his countenance was of a sallow hue, and, in a remarkable degree, indicative of extreme suffering and anxiety ; the tongue was covered with a brown fur in the centre, and a stripe of white on either side : the pulse small and very rapid ; *excruciating* pain increased by the slightest pressure or the slightest motion, or even by allowing the limb to hang unsupported, it attacks him in paroxysms, causing him frequently to cry out. On the right side it occasionally shoots down to the knee. The right hip joint is swollen ; the superficial veins are dilated and turgid, the fold of the nates is obliterated, and the patient lies partly on the left side and partly on his face, with his limbs flexed ; excessive thirst, and his skin is dry and burning ; V. S. ad $\frac{3}{4}$ viii. ; twelve leeches ; stuping and poultice ; two grains of calomel, and two of James's powders every third hour.

16th. In the early part of the night, the paroxysms of pain were severe and frequent, but afterwards he slept four hours, frequently moaning ; bowels free ; the blood drawn from his arm yesterday shewed no buffy coat, the clot was large, but

firm and florid, the serum in very small proportion; calomel and James's powder repeated.

17th. Aggravation of all the symptoms; pulse 120, and feeble; countenance more depressed; purging and griping; the calomel and James's powder omitted; ordered saline diaphoretic mixture, with tincture of opium, a large blister over the ilium.

18th. Rested well last night; pain abated; greatly relieved; complains chiefly of weakness.

20th. Skin cool; tongue cleaning; pulse 96; diarrhœa; pain less severe; still frequently moans; pulv. ipecac. comp. gr. iv. ter in die.

22nd. Profuse ptyalism; mouth slightly ulcerated, better in every other respect; ordered to gargle with the solution of the chloride of soda, syrup, and water.

24th. Improving; mouth still very sore, and ordered to be brushed with a solution of nitrate of silver, consisting of ten grains to each ounce of distilled water.

30th. Considerable swelling and prominence of the nates of the affected side, severe pain on pressure, and at one point an obscure sense of deep fluctuation. An incision made down to the bone through the periosteum, near the sciatic notch; the membrane thickened, and easily separated from the ilium; no fluid evacuated at the time, but in two days afterwards a considerable quantity escaped. He ultimately recovered.

CASE 6.—Peter Neale, ætat. 12, admitted January 11, 1833, into the Richmond Surgical Hospital. Four days previous to admission, he fell from a wall of moderate height, on the left hip, which was so much contused, that he was unable to stand upon the limb, and was carried home. The pain and constitutional disturbance daily increased. On admission, it was found that the left hip joint was very tense and swollen; the pain was so excruciating, that he was unable to move in bed without assistance. His countenance anxious, sunken, and expressive of great and intense suffering; tongue greatly

furred; black sordes about the teeth; pulse rapid; some cough; raves at night; ordered leeches to the hip; two grains of calomel and half a grain of ipecacuanha every third hour.

12th. No improvement; constant delirium during the night; yet, when spoken to, he answers rationally; screams and cries loudly at times; leeches repeated; fomentations and poultices; head to be shaved and cold lotion to be applied; calomel and ipecacuhana continued.

13th. Screams without intermission; pain in the left hip unremitting; delirium; countenance more sunk; tongue white; thirst great; headach; feet cold; manner agitated; *pain* in the *right shoulder and elbow*, but no swelling; hip extremely tender and more tense, swollen, and elastic to the feel. An incision about two inches long made at the upper part of the hip, behind the anterior superior spine of the ilium, through the gluteus, the lips of the wound separated widely, so as to render the incision almost oval in form; relief expressed immediately, no fluid escaped, and a careful examination did not indicate the existence of any under the periosteum. Twelve grains of calomel and a grain of opium in nine pills, one every third hour; blister to the arm; stuping of the feet and legs.

14th. Mouth affected by the mercury; rested well during the night; respiration catching, and forty-two in the minute; pulse 150; considerable diminution of pain; increased power of motion in the limb; slight cough and wheezing respiration; great thirst; drowsiness, and tendency to coma; occasionally muttering; delirium and screaming; a peculiarly wild and frightened look; an anodyne draught with antimonial wine at bed time; a blister to the chest.

15th. During the night an increase of delirium, restlessness and loud screaming up to half-past seven o'clock this morning, when he died.

Post mortem examination five hours after death.—The muscles remarkably rigid; lividity of the lips; frothy mucus and sordes on the gums and teeth; large violet patches from

congestion, on the posterior part of the trunk. Pia mater and brain more vascular than usual ; a considerable quantity of high coloured serum effused unto both pleuræ ; extensive, close, and recent adhesions between the pleuræ ; both lungs inflamed, and so highly congested, that portions of them sunk in water, numerous small abscesses on the surface, and some in the substance, containing an imperfectly formed pus, and having their cavities lined by a thin coating of lymph, and the surrounding pulmonary tissue very vascular ; intense bronchitis, particularly of the divisions of the left bronchus ; upwards of two ounces of high coloured fluid in the pericardium ; the serous covering of the heart of a milky white colour. On cutting through the left gluteal muscles, matter issued from numerous small points. The muscular fibres were of a deep red colour, the periosteum was detached from the entire of the ilium, by a quantity of a dark brown pus, which passed through the great sciatic notch, and separated the membrane from the whole concavity of the bone, which was of a pink colour. The fluid had passed, through a round ulcerated opening in the capsule of the hip joint, from the acetabular cavity. Small portions of lymph were found on the head of the bone, the synovial membrane covering the fatty mass at the bottom of the acetabulum, was inflamed and covered with lymph. There was no ulceration of the cartilages. The right shoulder joint healthy ; in the right elbow a fluid in moderate quantity was found, resembling that contained in the hip joint, and under the periosteum of the ilium.

(To be continued.)