TWO CASES
OF
PERIODICAL INFLAMMATION OF THE
RIGHT KNEE-JOINT;
WITH REMARKS.

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FOURTEEN years ago I had under my care a female patient, who was attacked with inflammation of the right knee-joint at almost regular intervals of time. After continuing, on each occasion, for about the same number of days, the attacks were followed by a state of health, the successive periods of which were also of nearly the same duration. In the course of many years the rate at which the disease was going, so to speak, became accelerated, but, as the recurrence of many successive attacks was nearly punctual, and could be predicted almost to an hour, and as, moreover, they arose without apparent external cause, it seemed clear that the whole disease was periodical, and I published the case under that designation.

It was not without hesitation that I ventured to put it forth as a fact. For the records of medicine contain few examples of a periodical repetition of local diseases, and none resembling that which I had observed. Three cases of regular attacks of vomiting, having a definite duration, and separated by equal intervals of health, are to be found in the 'Transactions of the Medical Society of London,' 1817, vol. i, p. 89. And the 'Medical Notes and Reflections' of Sir Henry Holland contain several examples of diseases presenting a periodical character. Some of these I may briefly refer to in confirmation of the remarkable cases I wish to record.

Dr. Joseph Adams's first case was that of a young gentleman, who was troubled for several years with a periodical sickness, which occurred every tenth day, and after lasting for several hours subsided. During the succeeding nine days he always remained tolerably well, and on every tenth day the attack returned. He was cured by arsenic.

The second case occurred in a lady, who had very painful nausea and sickness, lasting throughout the whole of every seventh day. With scarcely any variation, this disease recurred regularly on the seventh day for fourteen years, when it was cured by arsenic. During these fourteen years she produced a child almost yearly, and neither gestation, parturition, nor attempts at suckling, made any difference in her complaint.

The third was a woman who for eighteen years had a weekly periodical sickness and headache at uncertain periods. The former was temporarily relieved by arsenic, which, however, did not stop the headache. Being a dispensary patient, she did not continue under observation to the end of her ailment.

"Dr. Leonhard, of Muhlheim, relates a singular case of a woman, in whom an attack of influenza (the severe epidemic of February and March, 1837) passed into a local quotidian intermittent, affecting first the left, afterwards the right arm, with every successive symptom of regular ague; the rigor, heat, and stage of perspiration all distinctly marked in each fit—other parts of the body wholly unaffected—the disorder

cured by quinine.”¹ Sir Henry Holland, moreover, relates instances of severe pain in the upper jaw, coming on each day precisely at the same hour, of daily painful enlargements of the tonsils; of daily punctual attacks of ophthalmia; of cough recurring at one hour only in every twenty-four; and of urgent thirst affecting a patient at a regular hour on alternate days. The character of the disease in most of these cases was further attested by their being benefited by quinine.

I am quite aware that the return of an ailment, at a given hour or day, does not determine the character of periodicity to be an essential part of its nature; and the semblance of such regularity which some cases present, may be explained by an accurate observance of their circumstances. Thus, in February last, I removed the tongue at the level of the anterior pillar of the fauces, together with the floor of the mouth, on account of an extensive ulcerated cancer. After the healing of the wound, I was disappointed to find, at each afternoon visit, symmetrical, nearly globular, firm, and painful swellings of considerable size in the digastric triangles, and I feared that a rapid growth of glandular cancer was proving the Surgeon to have done rightly, who had allowed the disease to go on to so great an extent unchecked by an operation. After some time, however, it came out that the swellings were not always present; then, that they arose while the patient was taking his midday meal, and subsided in the course of the afternoon. And it was soon clear that they were of the nature of mumps, and were due to contraction of the scar at the divided orifices of the Whartonian ducts, whereby the out-flow of the saliva, secreted during dinner, was obstructed. This explanation of the occurrence is borne out by the continued health of the patient to the present time.

My conviction of the reality of the disease in my first case was confirmed last year by my meeting with a second example of inflammation of the right knee-joint, presenting the same peculiar character of periodicity. Having thus had the opportunity of twice recognising this unusual occurrence, and having taken such precautions as convinced me that the

¹ ‘Medical Notes and Reflections,’ 3rd edition, p. 293.

symptoms were not feigned or artificially produced, I venture to introduce both cases to the notice of the Society.

CASE 1.—A slender and delicate woman, æt. 43, came under my care in the Middlesex Hospital, December 30th, 1852, with her right knee-joint loosely swollen with fluid. The next day the fluid was almost gone, and by January 1st, 1853, it had quite disappeared. The joint had begun to swell on December 27th.

Until January 5th, the joint was quite well. On the 6th, she felt her right foot cold two or three times, and in the course of the day a little swelling appeared in the right knee. On the 7th there was a considerable but loose swelling and some increase of heat about the knee. She felt otherwise quite well, and her tongue, pulse, appetite, and evacuations were natural. On the 8th the synovial membrane was quite full and tense, bulging a good deal on each side of the rectus tendon, and reaching three inches above the patella. On the 9th the joint was loosely swollen again, and on the 10th was well. There was a movable body in the outer part of the joint, but it gave her no inconvenience. She appeared and felt well, but she had a little enlargement of the spleen.

Her account was that at the age of 18 she had ague for six months, which was at first quotidian, then tertian, and afterwards quartan; and that it ceased on her taking a powder which caused copious perspiration. All her family, with whom she was then living at Dover, suffered from ague.

She married and had some children, and her health was good for eight years after the cessation of the ague. She then, eighteen years ago, found her knee become painful at the close of a busy day at household work. The joint swelled, and the swelling increased until the third day, when it subsided. She remained well until thirty days after this attack, when it was repeated, lasted precisely the same time, and then again left her perfectly well. The inflammatory swelling recurred for some considerable period at regular intervals of a month, but afterwards it was repeated more frequently, returning every three weeks. About seven years

ago, it began to reappear every ninth day, varying only in the hour of its onset, but not in the day. The attack was always preceded by coldness of the foot, and there was always a moderate degree of pain on the third day, which was increased by previous use of the knee, but lessened by repose.

She said that she had had several children since, as well as before she became subject to these recurring inflammations, and that her youngest child was about six years old. The attacks had ceased in every pregnancy at the third month, and had not returned till the third month of lactation, when they recurred regularly as before. In point of time the menstruation was independent of the attacks; it had always been healthy, and had always occurred during lactation, equally during the three months in which the attacks were interrupted as in the later period. No other circumstance but pregnancy and lactation had exerted any influence upon the ailment.

In expectation of the attack on the evening of the 14th, I ordered a calomel and colocynth pill for the 13th, and a senna draught on the following morning. Three grains of quinine were also taken two or three times during the 14th, and some ice was applied to the knee. The attack failed to make its appearance at the expected time after the adoption of these measures, and there seemed to be some hope that it had been averted. After a few hours' delay, however, it returned, and it proved to be so violent that she said she had never had so much pain on any previous occasion. The joint became more than usually swollen, but it entirely subsided again.

After this I prescribed arsenic to be taken internally, but it failed to check or to alter the course of this singular affection.¹

CASE 2. — Susannah R—, æt. 21, a housemaid, well nourished, florid and healthy in appearance, came into the Middlesex Hospital under my care January 3rd, 1865. Her right knee-joint was loosely swollen with fluid, which occupied

¹ From the report of one of my Clinical Lectures in Surgery. The 'Lancet,' 1864.

the synovial cavity above and on either side of the patella. The joint was not tender or painful, and it was reported to be recovering from an attack of swelling and pain, which had commenced spontaneously December 30th.

On the following day the right knee was no longer swollen, and both it and the left measured $13\frac{3}{4}$ inches in girth at the top of the patella. On the 5th the right knee was a quarter of an inch less than the healthy one.

The patient stated that this inflammatory attack was one of a series which recurred regularly every twelfth day. Each attack lasted five days, and laid her up, but in the intervals she was quite well and able to do her work.

On more precise inquiry it was ascertained that she first felt pain and stiffness, with swelling, of the right knee three months ago. She applied wet cloths, and the next morning felt nothing more of it. A similar attack came on about twelve days afterwards; but this was more severe, the pain and swelling being greater. After twelve days more the knee inflamed again. She did not remember the dates of these three attacks.

A fourth attack occurred November 23rd, and a fifth on the 5th of December. This attack lasted five days, and she left her place and became an out-patient under the care of Mr. Lawson, at the Middlesex Hospital. From this time she rested her knee.

The sixth attack was delayed to the 13th day, not beginning until December 18th. It was less severe than most of the previous ones, continuing only three or four days. On the 29th the catamenia appeared, and they were perfectly natural.

The seventh attack began on the 12th day, December 30th. It was subsiding at the time of her admission into the Hospital, and it lasted five days.

With the exception of the sixth, which was unpunctual and of short duration, each of these attacks was more severe than the previous one. They usually began during the night or early in the morning with shooting pain in the leg and thigh; this was followed by a dull aching pain in the knee,

and at the same time by swelling of the joint, which progressively increased for two days and a half. The swelling was then at its height, and the pain so irksome that she could not keep the limb in any posture, and was restless the whole night. The pain after this moderated and, with the swelling, gradually subsided, and was quite gone on the fifth day. She noticed redness of the knee, and thought it brightest during the decline of the disease. She had not felt coldness of the limb or general shivering at the beginning of the attacks, nor local perspiration during their course. And she had not been conscious of any feverishness before or during the inflammations. She sometimes had pains in the right arm while the right knee was painful, and in the left knee during the intervals of the periodical attacks, but no swelling or stiffness or other pains of any joint except the right knee.

Family history.—Her father is a tailor, alive and healthy; her mother died four years ago of phthisis. Three of their eight children died in infancy, and a fourth died in the hospital twelve years ago of cancer of the left knee and the brain. One of her sisters had swelling of one knee, which was cured by a mustard poultice and did not return. Another sister is now consumptive.

Previous history.—She was born in Somers Town, and always lived in London. Her health was good until two years and a half ago, when she resided in the Regent Circus, and had debility, nervousness, bad appetite, dyspnœa, and pain in her right side. In February last she went to live in Kensington, and her health much improved. She never had ague, nor had any one living in the same house with her, although in the neighbourhood of her residence at Kensington many new houses were being built, and the earth was a good deal turned up. She herself attributes her illness to kneeling on stone steps, the washing of which was a new duty undertaken by her not long before the first attack of inflammation. Her catamenia are said to have been always natural and regular, at periods independent of the times of the attacks; they last occurred on the 29th of December, the day preceding the present attack. Her

resting during the last five weeks, and her removal from Kensington, have not put a stop to the attacks.

From the 5th to the 10th of January the knee was observed daily, but nothing unnatural was discovered in it either as to temperature or measurement. It was in both respects about equal to the left knee. A loosely attached body, or thickened portion of the synovial membrane, could be felt to move under the fingers in the space between the vastus externus and the anterior edge of the fascia connected with the tensor fasciæ femoris, where the joint is most superficial.

Eighth attack. Jan. 10th.—Some aching was felt towards evening in the right knee, and about midnight severe shooting pain. In the latter part of the night she slept well; but, on awaking in the morning of the 11th, she found herself unable to move that knee without pain. In the forenoon the knee was found three quarters of an inch larger than the left. The swelling was soft and fluctuating, and the skin about the knee was reddened. The pain varied in severity, and was less than it had been in the night. She did not observe any chilliness to precede the attack, but its anticipation by a day caused this symptom not to be looked for. After her dinner of meat and porter she was flushed, and her pulse rose to 100, and was full and bounding; her skin was hot, and the palms of her hands moist. The temperature of the right knee was $95\cdot25^{\circ}$, that of the left 89° ; both knees were rolled with a flannel bandage. At midnight the heat of the right knee was at $94\cdot5^{\circ}$, whilst that of the left was 93° .

12th.—Except when disturbed at midnight she slept from 10 till 5. To-day the right knee is less painful and less tense; its temperature is $93\cdot3^{\circ}$, that of the left being 90° , and its circumference is $13\frac{1}{4}$ inches, which is half an inch larger than the girth of the left. After dinner her pulse was 86, not full or bounding; her face was still flushed, and her hands moist, but less so than yesterday. The bowels have been open daily; the tongue is clean and the appetite good; the urine appears natural.

13th.—She slept well last night, and she is less flushed to-day; her hands are cool. Pulse 84. Some dull aching pain

continues in the right knee, but it has much moderated, and the swelling appears to be gone. The right knee is $13\frac{5}{8}$ inches in girth, being not one quarter of an inch greater than the left. In temperature the right knee stands at $94\cdot1^{\circ}$, the left at $93\cdot1^{\circ}$. By 8 o'clock in the evening all pain in the joint had ceased.

14th.—She slept well and is entirely without pain to-day. The girth of the right knee is $13\frac{1}{4}$ inches, being somewhat less than that of the left, and its temperature, 92° , is also below that of its fellow, which is $92\cdot3^{\circ}$.

Her knee now felt well, and she was up and about; flannel rollers were kept constantly on both knees, and their temperature was examined daily until the 19th, and found to be equal, and varying from 92° to 90° .

On the 20th, the temperature of both knees was depressed, that of the left much more so than that of the right. The right knee was at 89° , the left at 86° ; there was, however, neither pain, redness, nor swelling of the right knee; she said merely that the right knee felt hot. On the 21st the temperature of the right knee was 93° , and was a degree and a half above that of the left. There was, however, no difference between them in her sensations.

Ninth attack. 22nd.—The attack returned this evening about 6 o'clock. She did not feel coldness of the knee, and did not shiver, but first noticed that the bandage became tight. In half an hour pain came in the right knee, and gradually increased. It awoke her occasionally in the night, but did not keep her awake.

23rd.—The joint is swollen, and about a quarter of an inch larger than the left; the synovial membrane bulging especially on the outer side of the patella. There are marks on it resembling scratches. The pain is less severe than in the last attack. She had pain during the night in the right side of the chest, and it continues to-day. Pulse, after dinner, 96. The hands are not moist.

24th.—She was awake last night and kept awake for an hour and a half by severe shooting pain in the right knee, after which she slept again for four hours. To-day the pain

has moderated, and is as slight as it was yesterday. The swelling has not increased, and there is no tenderness. Pulse 84. She is not hot or feverish. Bowels are open.

25th.—She slept well. To-day she has still less pain in the knee; the temperature of it remains high, though the swelling is moderate. She has a cold, with inflamed left tonsil, and her pulse is 100.

26th.—The pain and swelling of the knee are gone, but still the temperature of it remains high, and her pulse 96. The throat is less inflamed.

27th.—Although there is no swelling of the knee there is a slight shooting pain in it. Its temperature is 95.3° , a degree above that of the left knee. The throat is well, and she feels well in herself, though she has dull pain in the right side.

28th.—The temperature of the two knees are equal, 94.2° .

29th.—The catamenia appeared.

30th.—Right knee, 93.2° ; left knee, 92.4° . No pain.

31st.—Right knee, 90.3° ; left knee, 89.2° . She had some aching in the right thigh, from the ilium to the knee, last night, but there is neither swelling nor pain in the knee to-day. The catamenia continue free and natural.

February 1st.—The aching of the thigh continues, but the knees are equal in measurement. The temperature of the right is at 95.2° , that of the left at 94.1° . The catamenia were ceasing. In the night some aching came on in the left knee, but it did not enlarge. Pulse 68.

2nd.—Right knee, 97° ; left, 97.1° . Only the aching of the right thigh continues. In anticipation of the expected attack to-morrow night, and to remove the doubt as to the nature of the case, which was suggested by the appearance of scratches on the last occasion, I directed the limb to be encased in a stiff starched bandage, from the middle of the thigh to the middle of the leg.

3rd.—The aching of the right thigh continues, but the knee, though feeling hot, is easy. There is occasional shooting pain to-day in the right arm. Pulse 72.

Tenth attack.—About 6 p.m., on the 3rd of February, she

felt the bandage become very tight, and the right knee ached severely. The splint was removed, and the knee was found swollen; the removal of the splint relieved the severity of the pain in the knee. At 7 p.m. one fifth of a grain (by error for a grain and a half) of quinine was injected under the skin of the leg. In the night the knee was hot but not tender, and half an inch larger than the left. There was pain in her right side both in the body and face. Pulse 84. A grain and a half of quinine in solution were injected.

4th.—From the time of the second injection all her pain was much relieved, and she slept a couple of hours in the night. There being smarting at the seat of puncture the injection was diluted to the strength of a grain of quinine in twelve minims of water, and employed three times a day.

5th.—Slept well. Some moderate pain continues in the swollen right knee, but it is less than is usual at this period of the attack, and her chief complaint is of the tenderness of the parts which were injected with the stronger solution of quinine; the other parts are not tender.

6th.—The pain in the knee and the swelling are subsiding. She had a violent frontal headache for three hours last night. She still complains of the tenderness of the first injected parts.

7th.—The swelling nearly gone. The pain is also less, though it has been sharp at times this morning; less tenderness of the injected parts. The last injection was given at midnight of 7th and 8th. On the 8th all pain and swelling were gone from the knee, and she had headache which seemed attributable to the quinine.

From the 9th to the 15th three minims of Fowler's arsenical solution were administered thrice a day, and on the 15th, as the eleventh attack was approaching, the dose was increased to five minims. It was ordered also that two grains of the solution of quinine in twenty-four minims of water should be injected into the limb before the next expected attack should supervene.

Eleventh attack.—This took place on the 15th of February, and it was moderate both in pain and swelling. Two grains

of quinine were injected at 4 p.m., and two again at 9 p.m.; she slept well. On the 16th she had aching down the leg, but little pain in the knee. Two grains of quinine were injected about 11 a.m., and at 3 p.m. she was flushed, and had headache, with pain in the right arm and side of the face, as well as in the right thigh and leg. The knee-joint, however, though swollen, was not tense or tender. Her pulse was 104. The headache was gone on the 17th, and through that day and the 18th the pain and swelling of the joint diminished; on the 19th they had entirely disappeared. Two grains of quinine were injected on each of the latter days. On the 11th the dose of the arsenic was reduced to two minims. With the exception of the 20th, on which day she was feverish and had a metallic taste in her mouth, she continued to take the medicine in the reduced dose until the twelfth attack. Some pain and doubtful swelling in the knee came on on the 21st and 22nd, but they soon passed off again. The catamenia recurred on the 25th and were perfectly natural.

Twelfth attack.—The joint swelled a little on the morning of the 27th, and was less again in the middle of the day. Some further swelling came on towards evening, and it was attended with slight pain. The temperature of the knee, however, was not unusually high, and but little above that of the opposite knee. Two grains of quinine were injected at midday, and in the evening. About this time the catamenia ceased. On the second day, the 28th of February, there was but little pain or swelling, and she felt well. Quinine was injected but once. Both pain and swelling were gone on the 1st of March, and on that day no injection was made.

The thirteenth attack anticipated by three days.—On the evening of the 8th the right knee again swelled, but it decreased on the morning of the 9th, when she was found to be a little feverish, and to be suffering from a cold and cough. Some fluid was distinctly felt in the knee in the afternoon, and the joint was uneasy when moved. On the 10th the right knee had become fuller, and was raised and soft on the inner side. Some moderate pain began in the morning. The joint remained equally swollen on the 11th.

On the 13th the swelling was gone, and there was no pain. The temperature on the 9th and 10th scarcely exceeded that of the left knee; on the 11th the right rose to $97^{\circ}0$, while the left, which was uneasy though not swollen, was at $91^{\circ}5$. On the 18th the right was $97^{\circ}5$, the left, 95° . The treatment during this attack was limited to an injection of two grains of quinine on the 12th, and one grain on the 13th.

As it appeared that the quinine injections to some extent controlled the severity of the attacks, I gave up the use of the arsenic, and directed that the injections should be made daily until the time of the next attack. Each injection made her very uncomfortable, producing headache, and sometimes vomiting. The last injection was made on the evening of the 18th.

Fourteenth attack.—This began with slight pain in the evening of the 19th. On the 20th there was very slight effusion into the joint, but no pain. An injection of quinine was given. The attack subsided through the 21st.

During this interval injections of half a grain of quinine were given until the 30th. On that day she vomited a greenish bitter matter, and complained of headache, but the knees were natural. The effervescing mixture of Citrate of potash was given every four hours.

Fifteenth attack.—On the 31st she had some uneasiness in her knee, but no swelling, and she was flushed and feverish. A little swelling and some slight pain were said to have occurred on the morning of April 1, but neither continued in the afternoon. On the 2nd she was quite well and was up again. The temperature was not taken during this attack.

To avoid the annoying sickness and headache produced by the injections of quinine, I ordered her a mixture, containing one grain of it, to be taken twice daily through the next intermission. She began the medicine on the 3rd of April, and continued it without discomfort until the 7th, when it was interrupted on account of catarrh. She took it again from the 10th to the 13th.

13th.—The *sixteenth attack* being expected, I ordered three grains of quinine to be taken twice during the day.

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No swelling or uneasiness of any kind took place, and she remained until the 17th perfectly well. On that day she was discharged, with the direction to return to the hospital in case of a recurrence of the ailment. She left in good health, florid and stout. The movable body on the outside of the synovial cavity could still be felt, and it seemed a little larger than when she was admitted to the hospital. It gave her, however, no uneasiness whatever, and she did not walk lame.

25th.—On this day, the day for a renewal of the attack, she said she felt a slight weakness in the knee, and that it was a little swollen; but the discomfort had not prevented her walking to the hospital, and no swelling was apparent on examination. She was otherwise very well, and she had not yet returned to her house-work.

During the following four months she paid numerous visits to the hospital, and she reported a slight attack on May 7th, which lasted to the morning of the 9th; an interval in which two attacks missed; a recurrence on June 12th, which was punctual on the forty-first day; and later attacks thirteen days, seventeen days, fourteen days, and fifteen days in succession. These attacks were all slight, except the last but one, which was severe. Since that of August 6th, which was the last, I have not seen her, but have occasionally heard from her that she has had no further attacks.

Table of attacks, and of temperature and measurement of knee-joints.

Date.	Right knee.	Left knee.	Measurement of right knee.	Number of attack.
January 4	...	...	13 $\frac{3}{8}$ inches.	VII.
" 5	...	...	13 $\frac{1}{8}$ "	
" 7-9 ...	...	...	13 $\frac{1}{4}$ "	
" 10 ...	...	...		VIII.
" 11 ...	95°·25	89°.	14 $\frac{1}{8}$ inches.	
" 12 ...	93·3	90·4	13 $\frac{3}{8}$ "	
" 13 ...	94·1	93·1	13 $\frac{3}{8}$ "	
" 14 ...	92·	92·3	13 $\frac{1}{4}$ "	

Date.	Right knee.	Left knee.	Measurement of right knee.	Number of attack.
January 17, 18.	91.	91.		
" 19 ...	90.	90.		
" 20 ...	89.	86.		
" 21 ...	93.	91.5		
" 22 ...	93.	90.3	(Before attack.)	IX.
" 23 ...	95.	92.2		
" 24 ...	96.	95.		
" 25 ...	96.4	92.3	Catarrh.	
" 26 ...	97.1	94.3	—	
" 27 ...	95.3	94.2	—	
" 28 ...	94.2	94.3		
" 30 ...	93.2	92.4		
" 31 ...	90.3	89.2		
February 1 ...	95.2	94.1		
" 2 ...	97.1	97.1		
February 3 ...	94.	90.		X.
" 4 ...	97.2	95.		
" 5 ...	95.	89.		
" 6 ...	96.	91.2		
" 7 ...	94.2	89.1		
" 8 ...	95.2	92.		
" 9 ...	89.	85.		
" 15 ...	95.4	95.4		
" 16 {	95.4	95.		XI.
" 17 ...	96.3	93.		
" 18 ...	98.	96.		
" 20 ...	96.	95.		
" 21 ...	93.	93.		
" 22 ...	...	...	Catarrh.	
" 23 ...	91.2	90.		
" 24 ...	94.1	93.2		
" 25 ...	95.	92.3		
" 27 ...	95.2	93.		
" 28 ...	96.2	95.		XII.
" 28 ...	96.2	94.3		
March 1.....	97.3	96.2		
" 8.....	...	...		XIII.
" 9.....	...	...	Catarrh.	
" 19.....	...	...		XIV.
" 31.....	...	...		XV.
April 7	...	...	Catarrh.	
May 7.....	...	...		XVI.
June 12.....	...	...		XVII.
" 25.....	...	...		XVIII.
July 12.....	...	...		XIX.
" 26.....	...	...		XX.
August 6.....	...	...		XXI.

Remarks.—Although there was in each of these two cases a movable body in the knee, and inflammations may arise from over exercise in joints where such bodies exist, I cannot bring myself to believe that the phenomena I have described could be so accounted for. The precision with which washing days and ironing days return in some families might explain much, but not all this; and particularly such active family duties could not account for the punctual recurrence of the ailments, while the patients were in bed in the hospital, and when the limb of one of them was motionless in a splint.

In the first instance these singular transitory inflammations appear to have been due to some ordinary injury or local chill, but they were afterwards brought on afresh without a repetition of the original cause. The occasion of each periodic renewal of the ailment lay in the system of the patient, and not in the nature of the external injury. In the case of the elder woman, there could be no doubt that this tendency to repetition of a disease usually terminating at convalescence was a relic of the ague from which she had suffered in early life. It is true that the affection of the joint did not obey the precise law of the ague in respect to the duration of the successive periods; but neither was the ague itself quite accurate in its time rate, inasmuch as it was at one time quartan, at another tertian, and again at another quotidian. But, notwithstanding minor dissimilarities, the alternate outbreak and cessation of the symptoms over and over again was too obvious a character of both diseases to permit of any doubt of their essential connection with one another. The younger patient never had ague, and this proof of the nature of her disease was therefore wanting. But its resemblance to the former case, and its submission to the action of quinine, may be reasonably held to show that it was of the same nature.

My second case is not the only example of a periodic local disease arising without previous ague. Dr. Joseph Adams also was unable to connect the periodical vomiting with that cause in his cases; but conjecturing that they were of the nature of ague he treated them with arsenic successfully.

Certain neuralgias and other strictly local intermittents, taken together with the case of my second patient, appear to show that a periodical disease may be of the nature of ague, though it do not implicate the whole system, as agues usually do; that there may in fact be a primary ague limited to one part of the body, as well as an ague which is general.

If this be so, it must be erroneous to think of ague as an original entity, capable of entailing upon a future local disease the power of spontaneously reproducing itself at intervals. The transient characters of chill, heat, and liquid effusion, produced at first by a local injury, are indeed like those of an ague; but their recurrence over and over again is not due to ague, which may never have happened in the case, but to some more general fault in the system which occasions either separately, or is common cause to both.

The cases further appear to indicate that some local disorder is an essential part of the whole group of intermittents. For since a general ague may subside into a local periodical disease, and such local intermittent may, moreover, arise without any other sign of a present or preceding ague, the two differ only in degree, and there must be inferred to be at the root of the true ague, equally with the local intermittent, an obscure, but real, limited disease.

A main difference between the general and the local intermittent probably consists in the seat of this primary disorder. Pain only, or a limited inflammation, occurs where ganglionic nerves are few; but ague spreads over all the sympathetic system, from an organ endowed with none other. Even in a limb an acute abscess is often sufficient to evoke all the phenomena, except periodicity, of ague fits; but they are usually much more severe, more prolonged, and frequent, when the abscess is in an internal organ. And so an ague, limited to an external part, is slight and tardy, though still, like many nerve affections, periodic: but, when associated, as it notoriously rather is, with engorgement of the viscera, and especially of the spleen, it is distinguished for its severity, frequency, and comprehensive implication of all the system.

In speaking of these intermittent phenomena it is difficult to know whether they should be conceived of as causes or as effects, for the mechanism of the periodicity is hidden. But the adoption of a foregoing periodic character by a new and local morbid process, such as of itself usually terminates in convalescence, appears to show the affected part to be not primarily in fault. My first case makes it clear that the reappearance of an inflammation of the knee once over and gone was due to an unnatural state of the system introduced at the time of the long prior ague, with which the knee had nothing to do. The periodicity of the new disease was in fact provided for before it came on.

I have spoken of a fault in the system which may be supposed to give the character of periodicity either to an ague fit, or a local disease, or to both. It is a fault which I should suppose to reside in the nervous system, and especially among the ganglia. The recurrence of an ague or of a local intermittent may then be but the rebound of its own impact on the nerves of the disordered part; and this rebound may be due to a tendency of nervous influence, natural enough when not exaggerated, alternately to advance in its motion and to recede, oscillating in waves, of which the length and height are determined by conditions of the moving impulses. The nerve pendulum of an ague may thus swing to the measure of three days, or of one, from a force which in the nerves of the same patient's right knee-joint takes thirty days to recoil, or nine.