great pain in connection with the monthly periods. Menstruation began at 13, is regular monthly, lasts seven days. Pain has always accompanied the process, but is becoming each year more intense. The suffering commences some hours before the onset of the flow, and lasts into the second day. Drugs have failed to relieve her. The patient was anæsthetised about a week before the onset of the period, and Hegar's dilators passed up to No. 12. The period which followed this dilatation was almost painless.

The most striking point in the course of the dilatation was the intense resistance offered by the tissues at the level of the internal os; it seemed as if one was endeavouring to stretch a ring of cartilage. To the hand accustomed to these dilating operations, it is easy to distinguish between the way in which a muscular spasm gives, and the dull tough resistance offered by a dense ring of fibroid tissue. Moreover the former quickly closes down when the dilator is withdrawn, while the latter, though yielding less readily, remains longer patent. In another case of a similar nature there were two distinct zones of fibroid stenosis at the level of the internal os about a quarter of an inch apart, and so dense and hard were these rings that it was necessary to nick them with a bistoury before dilatation could be satisfactorily completed. In both these cases the uterus was well developed, and the uterine sound passed 2½ inches. Space does not permit of the narration of more of these interesting cases, but a brief consideration of the two examples already given will enable us to see what a hindrance to dilatation of the internal os at the menstrual epoch is offered by the anatomical condition, and what a cause of menstrual suffering is necessarily present. To anyone who has watched the slow and painful dilatation of a fibroid cervix at full term, the comparison cannot fail to be instructive. The following case is also of such interest in this connection that I cannot refrain from quoting it:—

Mrs. O'C., aged 28, came to me with the following history: In her last confinement some five years ago, her cervix was lacerated bilaterally right up to the vaginal roof. Neither before this labour nor for twelve months afterwards did she have any dysmenorrhœa, but about a year after the birth of this last child she had trachelorrhaphy done, and ever since this operation she has suffered exquisite pain before and with the monthly period. Drugs do her no good, and relief is only gained by occasionally dilating the cervix between two menstrual epochs. Vaginal examination shows that the plastic operation was completely successful, but on each side of the cervix, and reaching up to the level of the supravaginal portion is a dense fibroid cicatrix. It is clearly in the resistance to dilatation offered by these dense deposits that the causation of the dysmenorrhœa is to be found.

D. Hyperæsthesia of the Nerve Endings at the Level of the Os Internum.

It is seldom that the uterine sound can be passed without giving rise to some pain, when the point of the instrument passes through the internal os, but under certain morbid conditions the ordinary pain becomes so intensified that it amounts to real agony, and patients will sometimes volunteer the remark that the pain produced resembles exactly that experienced during the onset of a menstrual time. If we note such cases carefully, it will be observed that one of two morbid states is usually present, either the patient is suffering from some existing inflammatory affection, such as endocervicitis or endometritis, with the discharges characteristic of these diseases, or else there is evidence that inflammatory troubles have existed, though their active stage is over and discharge has ceased; and here an exquisitely tender condition of the recently irritated nerve endings is all that is left to tell us of what has come and gone. In either of these cases pressure or dragging on the hyperæsthetic nervous tissue, such as may be caused by the passage of a sound or bougie, is sufficient to cause horrible suffering. A moment's consideration will make clear to us that the dragging open of the os internum by the uterine retraction connected with the early stage of menstruation will act precisely in the same way as pressure from within, and thus in these cases the exquisite pain felt in the first part of the monthly sickness is readily accounted for. In this connection it will be interesting to study a quotation from Dr. Matthews Duncan's paper on Spasmodic Dysmenorrhœa;[1] comparing the after-pains of parturition to spasmodic dysmenorrhœa, the great obstetrician remarks:

You will often read in books that when a woman has after pains there is a clot or a retained bit of placenta, or something which the uterus is attempting to expel, and this may be true, but such after-pains are not severe. That is not a disease, that is a healthy condition of the womb; the womb is doing its duty, as it were, and such after-pains are not very painful. The real disease of after-pains is a disease in which the recently emptied uterus goes into the most violent and painful contractions without any discoverable object in view; and a severe case of this kind is a most painful disease, far more painful than the after-pains which come to expel a clot or a bit of retained placenta. Now these violent after-pains are, I believe, connected not only with a morbid condition of the muscular tissue, but chiefly or primarily with a catarrhal condition of the mucous membrane covering the inside of the body of the uterus, a condition not without several analogies with the healthy menstruating uterus.

In other words, contractions, which are only moderately painful when nerve endings are healthy, become the cause of the most acute suffering when catarrhal inflammation has left these endings in a condition of over-sensitiveness. It is scarcely necessary to quote cases illustrative of this variety of dysmenorrhœa, or to dwell longer on the causation of the pain, for instances will come readily to the memory of anyone who has much to do with obstetric medicine.

A more practical point is the question of suitable treatment. Briefly, this may be summed up as follows: When endocervicitis or endometritis is present, these conditions should be removed by the use of leeching, saline aperients, the application of carbolic acid or iodised phenol, and hot douching; but when no evidence of active disease can be found and a tender condition of the nerve endings is alone recognisable, then rapid dilatation will bring about a cure most speedily. How this latter remedy acts is not quite clear, but it is an undoubted fact that a very moderate amount of dilatation will diminish to a most marked extent the sensitiveness of the tissues at the level of the os internum.

In reviewing the subject of dysmenorrhœa, then, it is not for a moment claimed that a complete explanation has been afforded of the causation of menstrual suffering in every case which may come under observation, nor that in any individual case the pain must be attributed to one, and only one factor. Doubtless in some instances several causes of pain may exist, and it is only by a careful study of each case, and by endeavouring to recognise and remove in turn each factor, that a complete cure can be effected. A single case will illustrate this point:

Mrs. R., aged 35, has borne five children; since the last confinement four years ago, she has had increasing pain with her monthly times. The pain commences some twenty-four hours before the onset of the flow, and lasts into the second day. There is some clotting at the times, and moderate yellow discharge between the periods. The passage of the sound gives great pain; the canal measures 3 inches. Uterus is normal in position; the cervix is hypertrophied, and its tissues unduly hard. Leeching and the application of iodised phenol on a Playfair's probe to the cervical canal greatly relieved the dysmenorrhœa, and checked the yellow discharge. It was not, however, until ether had been given and the canal had been dilated up to Hegar No. 12 that perfect freedom from pain was obtained. Here, doubtless, hyperæsthesia of the nerve endings, resulting from cervical catarrh, was one cause of the pain, and rigidity of the cervical tissues another; both had to be corrected before a perfect cure was obtained.

Simplicity of explanation always carries a charm with it, and far-fetched theories seldom convey the germs of truth; it is possible, however, to err on either side, and, in avoiding stretches of mere imagination, to reduce simplicity to absurdity. The only safe and scientific method in any investigation is to study clinical facts, to compare one natural process with analogous workings of Nature, and, when facts do not perfectly fit with theory, to wait till more extended investigation gives a clearer and more perfect knowledge. Much of the difficulty which attends the study of dysmenorrhœa arises from the efforts of well-intentioned workers to make one theory explain all the phenomena of menstrual pain, and from neglect of the wise adage of the great French physician—that before fact theories must always bend.

[1] *Diseases of Women*, p. 132.

METROSTAXIS AND MENSTRUATION AFTER OPERATION ON THE BROAD LIGAMENT.

By W. JAPP SINCLAIR, M.D., M.R.C.P.,
Professor of Obstetrics and Gynæcology Owens College, Manchester.

Frequently after operation of any kind on the broad ligament, and invariably after operations involving the ligation of any considerable number of veins in the broad ligament, there occurs an oozing of blood from the uterus. It begins twenty-four or forty-eight hours after the operation, and continues, as a rule, for several days. This discharge of blood

has been called sometimes "pseudo-menstruation," but, as it is not menstruation, this term ought to be abandoned. The *status menstrualis* includes the general and the local conditions in the human female which occur periodically during sexual life, and it implies, therefore, everything characteristic of menstruation. There is a rise of blood pressure, at any rate a change in the character of the circulation, and that this change is general and not local is shown by the distant phenomena such as headaches, but it affects especially the pelvic organs. Along with this change in the circulation there is a nerve element in the menstrual state, as shown by emotional phenomena, and occasionally by the extremely violent nerve storms which we designate by the terms hystero-epilepsy, menstrual epilepsy, etc.

There is also in the menstrual state a pelvic congestion of an extreme degree of intensity. This pelvic congestion recurs periodically, and is never absent in some degree during the sexual life of the woman; it is not abolished even by pregnancy; it is only greatly modified by lactation. Its recurrence is proved, first, by pain within the limit of health. There is also just outside the limit of health, accompanying mysterious forms of uterine and ovarian disorder, a rise of temperature immediately before menstruation and during the first days of the period. When the temperature is taken frequently both in the axilla and in the vagina of a woman in this condition, the rise and fall of the temperature as compared with that of the inter-menstrual period is clear and distinct. Thirdly, in case of fibro-myoma of the uterus, the congestion produces enlargement of the tumour, giving rise to pressure symptoms before and at the menstrual period which do not exist when the blood supply is in the normal condition between the periods. The inference from this as to the recklessness of operative interference at or near the menstrual periods is quite obvious. Fourthly, after operation by which the tubes and ovaries are removed, we can in some cases still observe the periodic recurrence of pelvic congestion. Take the case of a woman whose tubes and ovaries have been so matted together as to require them to be removed, perhaps piecemeal, and involving considerable injury to the pelvic peritoneum, and necessitating prolonged drainage. In such a case a sinus remains keeping open a communication from the floor of the pelvis to the external opening in the hypogastrium. Not in all, but in many such cases at the time corresponding to the menstrual period there is a discharge of blood from the sinus; this discharge lasts a day or two or more and then disappears, to recur once more at the time corresponding to the menstrual period. After a few months, when the congestion characteristic of the menstrual state has diminished in degree, the discharge from the sinus may only consist of an increased amount of pus or serum. These phenomena are not necessarily accompanied by any discharge whatever from the uterus itself.

Again, the continuance of the periodic congestion after operation is shown by periodic constitutional disturbance, apart from discharge either from uterus or sinus. Every tiro in abdominal surgery has to go through his anxieties with regard to some cases of oöphorectomy which he may have begun to look upon as absolutely safe. In many of these cases, when the time corresponding to the first menstrual period after operation comes round, he finds the patient ill. The pulse is quick, the temperature high, running up perhaps to 102°, or even more; the pelvis is tender; and in fact, everything appears to point to an attack of peritonitis. If the patient is let alone, the symptoms subside in the course of two or three days, and all goes well for a time. The next menstrual period is accompanied with less constitutional disturbance, with less marked local signs. In the course of months, as a rule, the periodicity of disturbance is not distinguishable. The nervous disturbances characteristic of the menopause begin, and obscure all the other symptoms.

But even the presence of the uterus is not essential to the occurrence of the periodic congestion. Among the cases of total extirpation of the uterus for cancer I have had a considerable number of patients who had not reached the menopause, and whose ovaries were not removed. In some of these cases there existed previous to operation well marked ovarian dysmenorrhœa; after operation, and when the parts operated upon had apparently completely healed, constitutional disturbance recurred corresponding to the menstrual periods, accompanied with the old ovarian pain. The constitutional disturbance and ovarian pain became less and less as the months passed by; but there could only be one interpretation put upon the phenomena—namely, that the pelvic congestion characteristic of the *status menstrualis* recurred even in the absence of the uterus.

Let us now consider the immediate effects of operation upon the broad ligament, and for the sake of illustration take a case in which it is necessary to remove both ovaries and more or less of both Fallopian tubes. If the operation be performed, as it ought to be, as remotely as possible from the next menstrual period, there will occur in the course of a day or two after operation hæmorrhage from the uterus. It may be slight and comparatively evanescent, or it may reach in amount the flow of a fairly profuse menstrual period, seldom or never more, and never to such an extent as to give rise to anxiety. This is my conviction with the experience of several hundred operations on the broad ligament. It is this ooze from the uterus which has been designated metrostaxis. What does it imply? It means that for some reason or other there is such interference with the return of the blood supplying the uterus, that the capillary vessels of the uterine mucous membrane must give way. In operating for the removal of ovaries and tubes when there are no adhesions, the upper part of the broad ligament may be so drawn up by the operator that in transfixing for the formation of a pedicle he may include some considerable branch of the ovarian artery as well as the pampiniform plexus and ovarian veins. In this case the blood supply to the body of the uterus is considerably diminished, and although the return flow is interfered with the amount of metrostaxis may not be great. It is in such cases that the wasting of the uterine body sets in most rapidly, and after the metrostaxis there may be no menstruation.

If, on the other hand, the operator does not reach any important branch of the ovarian artery, but by ligation largely interferes with the veins of the broad ligament, the blood supply to the body of the uterus goes on, while the return flow is greatly embarrassed. The immediate consequence is a profuse metrostaxis of longer or shorter duration; and the remoter effect is slow involution of the uterus, and consequent recurrence of menstruation. The arteries of the body of the uterus remain almost intact, there is a prolonged congestion of the uterus, and the recurrence of the *status menstrualis* brings sufficient additional congestion to produce the external sign of menstruation.

In pelvic hæmatocele, when the mass of blood is high up in the broad ligament, and has had time to become firm, we see metrostaxis follow in the great majority of cases. The blood flow is usually more prolonged than after operation, and may be modified by the recurrence of menstruation. The explanation of the metrostaxis and its modifications appears obvious enough; the mass of blood is sufficiently firm to obliterate the veins, but not to close the arteries; the arterial system, indeed, remains intact, and the influence of the ovary upon the status menstrualis also remains intact. The later changes which take place after hæmatocele situated in the position to produce metrostaxis are beside the mark for the present; but if they were traced they would go to prove that the effects of the hæmatocele are at first chiefly mechanical and closely analogous to the tying of the veins, which chiefly bring the blood back from the body of the uterus.

The immediate effect of operations on the broad ligaments, then, as measured by the metrostaxis, is also a measure of the remoter effects as seen in menstruation; the more profuse and prolonged the metrostaxis the more profuse will menstruation be, and the longer the time which must elapse until menstruation becomes completely suppressed.

Among the conclusions which we may draw from what has been said, if the facts and inferences are correctly stated, are:

1. The hæmorrhage, after removal of the ovaries and tubes, whether immediate or remote, depends almost purely on anatomical, not physiological, considerations. If the arteries are tied, even though the tubes and part of the ovaries be left, involution will follow in the body of the uterus, and menstruation will cease. If the arteries are not tied there will be profuse metrostaxis, and menstruation will continue, it may be for many months or years, even when the ovaries and tubes have been carefully removed.

2. If this be true, then it follows that the Fallopian tubes have no special physiological function in menstruation; they are neither "the cause" (if any meaning can be put into the term) nor "the starting point" of menstruation.

3. A practical deduction from the whole matter is that in operating on the broad ligament for the purpose of bringing on the menopause or involution of the uterus, the operator should endeavour to tie the chief branches of the ovarian arteries. Especially is this the case when the object sought is to bring about retrograde changes owing to the presence of small fibroid tumours of the uterus. There is little or no danger of starving the uterus by cutting off the blood supply to a dangerous extent; the danger is almost always that too little will be done, and the object sought for only imperfectly attained.

A LOCALISED EPIDEMIC OF INFLUENZA FATAL FROM HYPERPYREXIA.

By HUGH JONES, M.B.,
Late Resident Physician Glasgow Western Infirmary, and Glasgow Maternity Hospital.

At the spring meeting of the North Wales Branch of the British Medical Association (1892) I read a brief record of a series of cases of fatal influenza which had come under my care. These cases, so violent in character and so disastrous in result, occurred in a remote, comparatively inaccessible, mountainous country district. Twelve deaths occurred within a few miles of one another in a small sparsely populated district situated about seven to ten miles from the town of Dolgelly. The district only covers an area of about three or four miles, and is not traversed by any highway of communication between large centres of population. The industry is entirely agricultural, with the exception of a gold mine situated on the edge of the district, which gives employment to about a hundred men. The age of the patients ranged from 8 to 53 years. The twelve fatal cases occurred among males, although I also met with several mild and ordinary cases of influenza among females in that district. I therefore concluded that sex was an important element in these fatal cases. This is more striking in view of the strong case that has been made out for the infectious character of the disease by Dr. Parsons and others; for all these cases were largely and mainly nursed and attended by females. My observations, at the same time, tended to confirm the view that "influenza is mainly, if not entirely, spread by contagion," although, from the free mingling of neighbours with one another in a rural district, it was impossible to make any definite statement on the matter.

Signs of catarrh of the respiratory tract were practically absent. The onset of the attack was sharp, sudden, and well defined. The first symptoms were those common to ordinary influenza—namely, chilliness, headache, and pains about the limbs and trunk, along with all the signs of extreme prostration and muscular weakness. There was unusually great acceleration of the pulse rate from the beginning, as well as a marked elevation of temperature, but the hyperpyrexia, which was the great and leading factor in these cases, did not show itself on the first day of the illness. I entirely failed to find any physical signs of inflammatory mischief which would in any way account for the terribly fatal character of the disease. The skin acted freely throughout almost without exception. The tongue had invariably a thick white coating. The urine was high-coloured and loaded with urates, but was not deficient in quantity beyond what might have been expected from the free diaphoresis. There was nothing in the chest or abdomen which I could detect by physical examination which calls for special mention.

Indeed, all these cases at the outset came quite within the category of mild and ordinary influenza, and no prominent danger signals showed themselves till the end was comparatively near. The illness lasted from two to five days, and the patients continued in much the same state as described above until the temperature began to indicate the extent to which the fever poison was playing havoc with the system. The pyrexia of the first stage did not exceed 104° F., but the ultimate hyperpyrexia ranged from 106.5° to 108.5°. With the approach of this hyperpyrexia the great prostration began to express itself in extreme restlessness, which gradually merged into delirium, which became latterly of a most violent character. This violent delirium gave place to coma and collapse just before death.

I describe these cases as instances of fatal uncomplicated influenza owing to my inability to detect any physical signs which pointed to any organic and tangible change in the structure of any of the tissues of the body. Examination of chest and abdomen, as previously stated, was quite negative, and, although there were such conspicuous indications of serious interference with the functions of the different parts of the nervous system, there was nothing to show definite change of structure as such. The pupils showed nothing unusual, and there was no localised paralysis of motion or sensation in any part of the body. Instead of pyrexia we had hyperpyrexia, and instead of restlessness and stupor we had delirium and coma.

As regards treatment, I may say that I tried the ordinary febrifuge remedies, with antipyrin, quinine, salicylate of soda, and large doses of bicarbonate of potash; but I am not aware that any of them were of special use. It was quite impossible to try the cold pack, even if I had been partial to it. We did all that was in our power in the way of nursing and supporting the patients, but I have to confess that the resources and conveniences of the neighbourhood were unfortunately most limited.

It would serve no good purpose to describe the cases individually, but I may perhaps be allowed to refer to one case in particular to show how terrible a disease we were dealing with.

On June 26th, 1891, I first saw R. H., aged 34, at about 12 noon. The patient was a strong, muscular, healthy, well-developed farmer. He had been taken ill during the night with the usual initial symptoms—pains all over, tendency to chills, headache, etc. When I saw him he was perspiring freely, pulse very quick, and temperature 103° F. He had no cough, and I could find nothing in the chest. His face was flushed, but not livid, and breathing was free, although accelerated. The urine was loaded with urates. I saw him again the next morning about 11. The relatives reported a satisfactory night. The patient had perspired freely all along, had taken nourishment well, and there had been no tendency to delirium. The temperature was now 101° F., the skin was acting well, breathing quieter, and pulse not so quick as on the previous day, and showed good volume. The patient expressed himself as feeling much better. In the afternoon, however, the friends noticed that he was not so well. There was something strange in his countenance, and they observed that the skin became intensely hot, and not so moist. With this the patient became so violently delirious that he could hardly be kept in bed, and died about 9 P.M., and just about an hour before I managed to reach the house after being sent for. This disease then killed this strong man in less than forty-eight hours.

The other cases, which I had more opportunity of following, did not terminate so rapidly, but eventually showed exactly the same features. The delirium was violent, and the highest temperature recorded on my thermometer was 108.5° F. The last death in this series of cases occurred on July 19th, 1891, and my remarks at the North Wales Branch meeting only referred to these, but on August 5th, 1892, I again met with a sporadic case, which was so similar in character that I felt compelled to give it the same name.

On August 5th, 1892, at about 10 A.M., J. W., aged 22, called at our surgery. The patient was a healthy, muscular, young man, and took a prominent and successful part in athletics, especially cricket. He did not feel well on rising in the morning. He felt chilly, general aches and pains, and some slight sore throat. I was struck with the quickness of pulse, and therefore took the temperature under the tongue, which was 102° F. Examination of the throat revealed nothing typical. There was some slight faucial inflammation, but no membrane or marked enlargement of the tonsils. I called at the patient's house to see him about 6 the same evening. His temperature was 103° F., pulse still very quick. Bowels had acted satisfactorily after an aperient given in the morning, and the skin was acting freely. He felt the throat much better, and suffered now no inconvenience from it either in swallowing or otherwise. I saw him again at 11 P.M. The temperature had risen to 104° F., but in spite of this the patient expressed himself as feeling very comfortable. I was somewhat alarmed at the continuous rise in temperature, but I hoped that under treatment and with free sweating the pyrexia would be less by the morning. However, when I was again called to see him at 7 A.M., I found the temperature was 106.5° F. The skin was moist, but there was no free perspiration. He was conscious, but his countenance bore a somewhat wild and strange expression. Pulse extraordinarily quick, breathing free, and face more pale than otherwise. At 7.45 A.M. the temperature was 108° F., and patient rambling. At 8.30 A.M. 109° F. was recorded. Patient delirious and somewhat violent; pulse running. At 9.30 A.M. the temperature was 110° F. Patient unconscious and somewhat rigid, breathing heavily and noisily; power of swallowing gone. He died a few minutes later, in spite of all that could be done for him—in less than twenty-four hours after he had visited the surgery.

I have called this case malignant influenza, although this may not necessarily be correct. The throat symptoms may