attention to the subject; and I should not have ventured to do so, had I not satisfied myself of the value of the observations by the most careful examination of the two tumours and the sprouting masses found in the ascitic fluid in the cases which I have recorded. Since those two cases, I have had many opportunities of verifying my observations.

Later investigations have convinced me that, while it is quite true that particles of sprouting epithelium do occasionally escape from ovarian tumours and grow on the surface of the peritoneum, after the manner of skin-grafting, yet it is equally true that masses of sprouting cells may grow from the peritoneum directly, as the result of chronic irritation, caused by a growing ovarian tumour, or by fluids which have escaped from ovarian cysts, and that even the pleural membrane may become involved in the irritation.

One cannot help recalling to recollection the beautiful plates of Klein, wherein he represents the little outgrowths from the peritoneum which appear as the result of chronic irritation of that structure. The microscopical appearance of these outgrowths resemble in a remarkable manner that of the masses of sprouting cells which I have so frequently found in ascitic fluid surrounding sarcomatous tumours of the ovary, and that of the nodules on the peritoneum. In my paper on the Development of the Ova and the Structure of the Ovary, I showed that the ovary is not invested by the layers of the broad ligament, as is described in many books, but that the stroma of the ovary is derived from, and is directly continuous with, the layers of the broad ligament, which is a prolongation of the peritoneum, so that we have a distinct connection between the stroma of the ovary and the peritoneum. This anatomical fact, I believe, will serve to explain how it is that we so frequently have nodular outgrowths from the peritoneum at the same time that the ovary is the seat of sarcomatous disease. The stroma of the ovary is probably first affected by the sarcomatous disease; and, by extension of the disease, and by chronic irritation, the peritoneum also becomes similarly affected. These sarcomatous tumours of the ovary and nodular growths on the peritoneum, do not readily affect the lymphatic glands in different parts of the body, as is the case with true carcinoma. If such tumours could be removed whole, the patients would have a good chance of recovery, but, unfortunately, sarcomatous tumours of the ovary have a great tendency to involve adjacent parts in similar disease, such as the uterus and broad ligaments, and the nodular growths on the peritoneum form adhesions with the intestines, and keep up a constant irritation, whereby ascitic fluid is poured out continually. Dr. Thomas Keith, at present, has under his care a poor hard-working woman, whose abdomen is full of sarcomatous growths, and yet enjoys fairly good health. More than four years old, I found in the ascitic fluid present a number of large sprouting masses of cells, which clearly proved that the peritoneum was seriously affected. Occasionally, this poor woman presents herself for tapping, but nothing else can be done for her.

When the peritoneum has become affected by a malignant ovarian tumour, the pleural membrane is often found to be similarly affected, as is the case with a lady under our care at present. Bloody fluid was withdrawn by tapping from the peritoneal and pleural cavities. In both fluids a great number of large masses of sprouting cells were found, the discovery of which has made sure the diagnosis of malignant pleuro-peritonitis and malignant ovarian tumour.

In the end of June 1875, I satisfied myself that a carcinomatous tumour of the omentum may, by infecting the peritoneum, give rise to large masses of free growing cells, which resemble somewhat the masses found in ascitic fluid surrounding malignant tumours of the ovary.

In the middle of June 1875, a single lady, aged about forty-five, was tapped by Dr. Thomas Keith, who drew off from the abdomen a large quantity of ascitic fluid. A large, flat, pancake-shaped tumour was then discovered in the omentum. In the ascitic fluid were large masses of sprouting cells, growing very vigorously, and immense large free cancer cells. In the absence of Dr. Keith from Edinburgh, the pleural cavity on one side was tapped by an Edinburgh surgeon; and in the fluid removed exactly similar growths and cells were discovered. After the death of the lady, I made an examination of the body, and found a large spongy tumour of the omentum and numerous cancerous nodules on the peritoneum; and in the chest, on the pleural surface of the diaphragm, were a great many small nodules of cancer growth. No doubt the lymphatics were the channels through which the cancer seeds reached the chest and peritoneum; and it is most probable that from the secondary nodules cancer cells escaped and grew vigorously in the ascitic and pleural fluids.

In conclusion, I now call attention to the following statements, as being of practical value. Malignant ovarian tumours are generally surrounded by ascitic fluid. The ascitic fluid in all cases should be care-

fully examined with the microscope. If in such ascitic fluid we find a large number of masses of sprouting vigorously growing cells, some of which masses may be seen by the naked eye, we may safely conclude that the peritoneum is the seat of a most serious affection, and that there are numerous adhesions between the tumour and neighbouring parts, which will prevent its complete removal by ovariectomy. If these masses be found in bloody ascitic fluid, we may conclude that there are vascular villous growths on the peritoneum; and if, in addition, the glands in the groin, or in the abdominal parietes, or elsewhere, be enlarged, the tumour and peritoneal growths are certainly carcinomatous.

As an additional means of diagnosis, the tumour itself may be punctured, under antiseptic precautions, with a fine aspirator-needle, and a minute portion of the tumour, or some of its cystic contents, be withdrawn for microscopic examination. The finding of sprouting masses of epithelium within the ovarian cysts is not of much practical value, as such tumours are often removed without risk of future peritoneal affection; but if they be found in the cysts of a tumour, and in the ascitic fluid surrounding the tumour, it is almost certain that serious adhesions exist between the tumour and adjacent parts, and that there are nodular growths on the peritoneum.

ON CERTAIN FORMS OF NON-PUERPERAL UTERINE HÆMORRHAGE.*

By A. E. AUST LAWRENCE, M.D.,
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THE paper which I have the honour of reading before you this evening is founded upon a class of cases, the importance of which every one here cannot fail to recognise; for the symptom of hæmorrhage is always one that causes alarm to our patients, and not unfrequently anxiety to ourselves; and although hæmorrhage from a mucous membrane is not always accompanied by a local disease, yet prolonged, irregular, and repeated bleeding from the uterus, or in fact from any mucous surface, demands, in most cases, a local examination before its source can be diagnosed and the appropriate treatment applied.

With a view of bringing prominently before you the causes which produce uterine hæmorrhage in non-puerperal women, in order that suitable treatment may be adopted, I have analysed my hospital cases with special reference to this symptom; and I find that, out of a total of nearly seven hundred patients seen by me during the last three years, ninety came complaining of hæmorrhage, and it was only that symptom upon which they laid stress when detailing their troubles. The hæmorrhage in these ninety cases was found to be due to eleven different pathological conditions.

I have omitted cases where the hæmorrhage, although a complication, was not the symptom of which they came complaining, as also those cases where the bleeding was due to recent results of a miscarriage or confinement.

It will be seen that the cases show hæmorrhage either as excess of menstruation, or independent of menstruation. Some, however, show both conditions. We may take as our standard normal menstruation, as represented by the following description of Dr. Barnes, viz.: "*Fluid blood, somewhat glutinous, discharged gradually to the amount of two to four or six ounces, lasting over a period of two, three, or four days, at regular intervals of twenty-eight days or nearly so; beginning at the age of twelve, thirteen, or fourteen, and lasting to forty-five or forty-eight*;" any marked deviation will then be probably caused by some pathological condition. I say probably, but not always, as, both at the commencement and at the end of menstrual life, there is great irregularity—the most marked being (1) irregularity as to periodicity; (2) occasional excess of loss of blood. With these two conditions, there are associated alternate enlargement and subsidence of the abdomen, with pain and induration of the breasts.

With the absence of distinct local cause of hæmorrhage, and no organic disease detected elsewhere, these cases having the above four conditions may be classed as climacteric, and treated on general principles; but only after the following conditions have been excluded—conditions which have caused a hæmorrhagic discharge to be of such moment as to induce ninety, out of nearly seven hundred, patients to apply for relief on account of it alone. The following are the eleven causes, and the number of cases they each furnished.

* Read before the Bath and Bristol Branch.

1. Malignant disease	25 cases.
2. Fibroid tumours of the uterus	8 "
3. Mucous and fibrinous polypi growing from the cervix uteri	9 "
4. Subinvolution of the uterus	10 "
5. Retroflexion	5 "
6. Antelexion	3 "
7. Parametric inflammation	5 "
8. Hæmatocele (pelvic)	4 "
9. Ulceration (so-called) of os and cervix uteri	12 "
10. Stenosis of cervix and os uteri	6 "
11. Anæmia	4 "

I will now mention briefly the main points in the diagnosis and treatment of each of the conditions above enumerated.

1. *Malignant Disease.*—It is certainly a terrible thing to contemplate that one out of twenty-eight patients, applying for different uterine diseases, should be affected with so terrible a disease; and of those applying for the relief of hæmorrhage, nearly one-fourth were malignant cases. Before passing to consider the points in diagnosis, I wish to refer to the very advanced condition in which most of the cases were before they came to the hospital; this I attribute to the fact that, in a good many cases, pain was not a prominent symptom in the early stages, nor was hæmorrhage, until the mass began to break down. The forms of malignant disease have been epithelioma in one-third and medullary cancer in two-thirds of the cases. The age has varied from twenty-seven to sixty-nine; so you see that age does not enable us to negative the existence of malignant disease. Fifteen cases were over fifty years of age. The chief points in the history were, that the catamenia had ceased for periods varying from one to ten years; and that they had again, to use their expression, become unwell; some of them with pain, and others without. This cessation and recurrence of hæmorrhage at this epoch of life is a most suspicious circumstance, and always demands a most careful examination; there may be no pain, and yet advanced cancer may exist. I have notes of several cases where the pain was so slight as not to draw the patients' particular attention to it. When pain is present, it is in some cases excruciating, being felt in the lower part of the abdomen, back, hips, and thighs. The pain is often lessened by the hæmorrhage, I believe, by relieving the general congested condition of the uterus; and were it not that anæmia is so soon induced by the repeated discharges of blood, one would regard the hæmorrhage to a certain extent as beneficial.

One point very suspicious of malignant disease is the way in which the hæmorrhage begins. Thus a woman may have ceased menstruating for, say two years, when she suddenly loses a great quantity of blood; probably this discharge goes on for twenty-four or forty-eight hours, and then ceases, to recur again, at an interval varying from a few days or weeks to even months, until it eventually becomes more or less continuous. I say this mode of bleeding is suspicious, but not absolutely characteristic of malignant disease, as I have seen it occur in two cases of fibroids of the uterus. In these cases, the women had both ceased menstruating about two years, when, in each case, a severe fit of pain (referred to the uterine region) and hæmorrhage set in suddenly and lasted for some weeks, when, upon examining them, I detected a fibroid polypus coming down through the cervix uteri.

In the other nine cases of malignant disease, the patients had not ceased menstruating. They all complained of excessive menstruation; in most of them the period lasted from ten to fifteen days out of each month; some of them had bleeding for about two days each week. The main point was that there existed an excess of blood-discharge, both too much and too frequent. Some had pain, others had none. There was nothing characteristic about the discharge of blood to enable one to say definitely, without an examination, what its cause might be. The suspicious point in some of them was that exertion or coitus would often produce a sudden flow of blood.

The only definite opinion is derived from a digital examination. In the advanced cases, it is soon learnt by the finger that the absence of the natural os and cervix uteri, a rugged cavity being recognised instead, a hard feeling in the roof of the vagina, and fixation of the uterus, tell only too surely the tale of malignancy. In early cases, the enlarged lip of the cervix uteri, with one or two prominences and a hardness about the cervix, is often quite enough to raise one's suspicions. The finger is all that is requisite for the diagnosis of malignant disease; but the microscope is required, in some cases, before we can say whether it is medullary or epithelial. Now, as the finger is so important, I often wonder that it is not more used in the diagnosis of the various uterine diseases to the partial exclusion of the speculum.

I am often asked by gentlemen, how I know by the feel that it is a malignant diseased condition of the cervix; why is it not something else. Possibly, they suggest simple ulceration, but at the same time admit they only know simple ulceration by the look and not the feel; and I trust that I may be excused for saying that no man has a right to use the speculum before his finger has told him that it is required,

and, I am sure, for the purpose of diagnosis, the speculum is not often wanted.

The diagnosis of malignant disease by the finger is done by exclusion, to a certain extent, until one becomes accustomed to the feel of cancer in its various stages and phases. Let the finger become accustomed to the feel of the different diseased conditions of the uterus, and then the diagnosis of cancer will be an easy matter. They can be deceived more easily than the finger. Take, as an example, a fibroid polypus hanging in the vagina; for some time, nothing looks so much like a mass of medullary cancer; it has a nasty sodden look, and bleeds when touched by the speculum; but as soon as the finger touches it, and sweeps round it and feels the cervix, all anxiety is at an end, as you have a case you can cure straight off.

The question of treatment is, I am sorry to say, not satisfactory; but a great deal may be done that is often left undone. Disinfectant and astringent injections give comfort, to say the least of it. Destruction of the sprouting mass with the actual cautery, although a temporary measure, yet is often beneficial for the time; as also is the plan of scraping the surface where the growth presents numerous small points. One plan, lately advocated by Dr. Marion Sims, is also a good one, and enables the surgeon to follow up the malignant disease higher in the uterus than can be done with the *écraseur*. His plan is to cut away, with knife and scissors, bit by bit, every portion of diseased tissue, restraining the hæmorrhage after with firm plugs of cotton-wool, soaked in a saturated solution of persulphate of iron. He maintains that the disease is kept in abeyance more by this plan than by any other of the operative proceedings.

In reference to the use of the *écraseur* in the various forms of malignant disease of the cervix, where it is desirable to remove portions of the uterus affected with cancer, my experience is that it is far inferior to the knife and scissors, unless the portion is very pedunculated. In the cases where the cervix is in broad flattish lobes of medullary cancer or epithelioma, it is almost impossible to get above the growth into healthy tissue. I believe the best plan is to cut away as much as possible, and use the actual cautery; but even this is not free from danger, as plugging of the pelvic veins has been occasioned by the application of escharotics and caustics to the diseased tissues.

With reference to medicinal treatment, the main point is to keep up the general health as much as possible, by giving cod-liver oil and mild non-astringent preparations of iron. To relieve pain, the various preparations of opium, chloral, etc., would at once suggest themselves to you; but there is one drug I have found very useful in relieving pain in these cases, and that is ergot. I believe it acts by lessening the blood-flow into the uterus, and therefore keeping it free from congestion. I was led to try it by noticing that the pain was frequently much lessened by hæmorrhage; and therefore I considered that, if it were possible to check the blood somewhat from passing into the uterus, then one might gain the same object. It has answered very well in several cases. As an injection in these cases, I prefer iodine, and, if much pain be present, I add carbolic acid and opium.

The prognosis in these cases is, unfortunately, bad; but I have been struck with the time that they go on without destroying life. One sees cases where the whole of the cervix is destroyed, with ulceration into the bladder and rectum, and yet they live for months. Other cases are more rapid, and seem to die without anything like the amount of local disease with which some patients live months.

2. *Fibroid Tumours.*—I now allude to the second class in my table, viz., those cases where the hæmorrhage was due to fibroid tumours in the uterus. There have been eight cases where the patients have come complaining of hæmorrhage, and, upon examination, a fibroid condition of the uterus was diagnosed. The age in five cases was under forty; in the remaining three, it varied from fifty to sixty. It is impossible here to enter fully into the diagnosis and treatment of fibroid uterine tumours. I only wish to draw attention to a few main points, so that one's suspicions might be aroused and one's attention directed to a possible cause of hæmorrhage. One main point is in the cases of those women under forty years of age—excessive menstruation, the discharge lasting ten days or a fortnight, and recurring at the end of a similar period. Another point noticed is that the blood most frequently contains clots, and the period is often accompanied with great pain. The sound often shows displaced conditions of the uterus and an elongated state, the cavity often measuring four or six inches. The diagnosis, in some cases, rests entirely upon the history of hæmorrhage and the enlarged condition of the uterus, as it is not always possible to detect a fibroid tumour of the uterus as a distinct mass, growing either into the cavity of the uterus, or out from its walls towards the cavity of the abdomen; in this last form, hæmorrhage is not such a troublesome complication, although the pain is often greater. One case came before me, eighteen months ago, with a history of excessive menstruation,

passing clots, and great pain. The cavity of the uterus measured three inches and a half. There was no external source for the hæmorrhage, and upon examining the cavity of the uterus, after dilating the cervix, there was not found any growth; however, from her history and the absence of any other cause, I entered it in my case-book as one of fibroid tumour of the uterus, most probably lying in the walls of the uterus, immediately beneath the mucous membrane. This patient took ergot for the last eighteen months, and gradually a fibroid tumour was expelled into the cavity of the uterus, and, dilating the cervix, presented at the external os. At this stage, I saw her again, and removed the growth with the *écraseur*. I relate this case as being typical of a large number of others, where the fibroid tumour lies in the wall of the uterus, between its muscular layers, and gradually grows towards the cavity, or is pushed in that direction by the fact that, in the case assumed, there is a thicker layer of muscular fibre on the peritoneal side of the tumour than upon the mucous; this gradually converts an interstitial fibroid into a submucous, and eventually into an intra-uterine tumour, and even it may be dislodged entirely from the body. In the cases where the age varied from fifty to sixty, the diagnosis of malignant disease had been made in two of them before they were sent to the hospital, simply on account of the hæmorrhage and pain; and, I am sure, anyone looking at them would have drawn the same conclusion. In fact, I would not give an opinion to my obstetrical clerk before I made a vaginal examination, as their history was like that of malignant disease. A vaginal examination revealed in all three cases a fibroid tumour coming through the cervix uteri, and in one case reaching nearly to the vulva. In each case, removal of the growth by the *écraseur* entirely relieved both the hæmorrhage and pain. To sum up, the diagnosis must be made partly by excluding all other known sources of hæmorrhage, and partly by direct evidence of the existence of a fibroid growth, either as an enlargement in the wall of the uterus or growing out from it. Several of my cases were diagnosed at an early stage to be fibroid cases, mainly by exclusion, with the assistance of two positive factors, viz., uterine enlargement and excessive uterine hæmorrhage.

The question of treatment I must dismiss in a few words as possible. In some of the worst cases, where the tumour is large and embedded in the uterus, nothing can be done with a view of curing the disease, unless we subject our patient to the ordeal of gastrotomy and remove the uterus. These cases, however, can have two symptoms relieved to a certain extent, viz., hæmorrhage and pain: the former by ergot and the latter by opium. In some cases, where the cervix is narrow and allows the blood to become pent up in the uterus, and so act as an exciting cause of more hæmorrhage, and pain is produced, these symptoms are relieved to a great extent by dividing the cervix. Where the growth is pedunculated, the proper course to adopt is removal by the *écraseur* or knife. Where no operative measures are admissible, much can be done by maintaining the uterus in a good position, keeping up the general health, and lessening the hæmorrhage by ergot, turpentine, etc.

3. *Mucous and Fibrous Polypi growing from the Cervix Uteri.*—In the nine cases in which these existed, there was no difficulty in the diagnosis. They were easily felt by the finger, then a speculum was passed, and they were stripped off, and nitric acid applied to the place from which they grew, which in all cases was just inside the cervix. All the patients complained of leucorrhœa and the discharge of blood-stained mucus, and occasionally pure blood, independent of any menstrual period—conditions, in my mind, absolutely demanding a vaginal examination, which was all that was necessary for a diagnosis, and the treatment required was perfectly simple; and yet these women had been going on like this—some for months, others for years—for the reason, as stated by them, that they did not like to see a doctor. The pain was not great, nor was there any great loss of blood at one time to cause them alarm: hence they put off the day until they became weaker and the hæmorrhage increased.

4. The next class includes ten cases of subinvolution of the uterus. The chief points complained of were excessive menstruation, with very profuse intermenstrual leucorrhœa. I have not included in this class cases where the uterus was displaced, or where there existed any other pathological condition, as a complication of the subinvolution. The cases to which I allude had a history of a confinement or miscarriage, dating back from a few weeks even to years. They all had the uterus enlarged, the cavity measuring from three to four, or even five, inches in length. The diagnosis was made partly by the history of the case and the physical examination, and partly by the exclusion of other states, the symptoms of which are somewhat similar. Although a certain proportion of cases of subinvolution are complicated with other states, yet these cases are mentioned simply as showing that the enlarged uterus, left after the termination of the pregnant condition, is enough of itself to produce copious hæmorrhagic and other discharges, and this without

any displacement or erosion of the cervix, etc., although these latter conditions often complicate subinvolution. The treatment I adopted in the ten cases I have brought forward was, to apply to the inside of the uterus the tincture of perchloride of iron, and to give ergot and bromide of potassium, and pay attention to the general health. I believe that, to obtain the proper involution of the uterus, it is most important to attend to the general health, as well as, of course, to rectify any local disturbance. They are tedious cases; but still a great deal can be done for them, if we are only allowed sufficient time.

5 and 6. *Retroflexion and Antelexion.*—The next class includes five cases of retroflexion and three of antelexion. They are mentioned, because the ordinary symptoms of these conditions were entirely absent. The patients came complaining of too much hæmorrhage at the menstrual periods, with a certain amount of leucorrhœa. They were all patients under forty years of age, and I could detect no cause for the excessive menstruation, except the displaced condition I have alluded to; and, as the periods lessened considerably when the uterus was maintained in its proper position by means of a suitable pessary, I think I am warranted in ascribing the menorrhagia to the displaced condition of the uterus. I simply mention these cases, so that it may enable any one to recognise a probable cause of hæmorrhage, when otherwise it might be overlooked, as the usual symptoms of the displacements mentioned were absent.

7. *Parametric Inflammation.*—I allude now to a very troublesome class of cases, viz., that of parametric inflammation, one of the forms of what is more commonly known as pelvic cellulitis. This condition, by fixing the uterus, has a great tendency to induce excessive hæmorrhage from that organ at the menstrual periods, more especially if the uterus be caught and held by the inflammatory effusion in a state of subinvolution. I mention this condition as being a cause of uterine hæmorrhage, chiefly on account of its being frequently overlooked, as it is sure to be, by those who only examine with a speculum, instead of using the finger, by which the hardness in the vaginal roof is at once recognised. The treatment locally in these cases is negative. One must rely upon time, aided by iodide of potassium, ergot, and good food; this treatment, in a certain proportion of cases, does good, but others remain to a very great extent incurable.

8. *Pelvic Hæmatocele.*—I now allude to a condition which has been the cause of excessive and prolonged uterine hæmorrhage in four cases, very likely from its situation so close to the uterus. I allude to pelvic hæmatocele, due possibly to the rupture of some veins in the neighbourhood of the uterus, or, I think, in some cases really formed by escaped menstrual blood through the Fallopian tubes in cases where there is a narrow cervix uteri.

The history in my cases has been that a period was just coming on, that some exertion undertaken at this time was followed by great pain in the abdomen and faintness and discharge of blood *per vaginam*, and, instead of the period passing over, it became constant, and had lasted some weeks when they came to the hospital. As the acute symptoms disappeared, so did the tendency to hæmorrhage. In these cases, we must not be in too much hurry to check the hæmorrhage, or lightly undertake to plug the cervix uteri, and so cause possibly more blood to escape into the pelvic cavity; and as long as the hæmatocele is recent, we must be very careful in making a vaginal examination. The best treatment in recent cases is to enjoin absolute rest in bed, with the pelvis raised. As for medicine, I prefer turpentine in recent cases to anything else; sometimes I combine with it small doses of ergot, but most often give it by itself. The cases that I have had all recovered in an average time of six weeks. It is surprising how great are the powers of nature, alone and unaided by art, to manage these cases—enormous effusions being got rid of in a comparatively short time; and with the subsidence of the hæmatocele, so has the tendency to menorrhagia become less and less, until eventually the periods have resumed their normal characters.

9. *Ulceration of Os and Cervix Uteri.*—The next class of causes for uterine hæmorrhage is the one, I believe, best known, and is visible to any one through a speculum. I allude to the so-called ulceration of the os and cervix uteri. It is not so frequent a cause of hæmorrhage *per se* as one might suppose it to be; for I have had only twelve cases where I could say that it was the real cause, and uncomplicated with either of the conditions to which I have already alluded. A large number of cases of other pathological states of the uterus have the cervix abraded as a complication of those states, and one must not be led to treat a minor and induced state instead of the real diseased condition; for instance, let a woman have a retroflexed uterus, and very soon the posterior lip will become congested, and very likely what is termed ulcerated. Here there may be a double source of hæmorrhage, and the sequence of events must be borne in mind in treating the case. The cases I have brought forward were pure examples of what an abraded

condition of the os and cervix uteri would do when uncomplicated with any other diseased condition. The menorrhagia and leucorrhœa induced by the above condition were both cured by local applications, the chief of which was nitric acid. The surface of the cervix healed in most cases, with about three or four applications of the strong acid, at intervals varying from a week or ten days, or a fortnight; and as soon as the surfaces were healed, the menstruation became normal.

10. *Stenosis, or Narrowing of the Cervix and Os Uteri.*—I have to allude now to a class of cases where, although pain is an important symptom, yet hæmorrhage is one that must be taken into account also; and it was mainly on account of the latter symptom that the six cases forming this class applied for relief. This condition, by not allowing a free exit for the menstrual fluid, allows a portion of it to coagulate *in utero*, and this acts as an irritant and causes a chronic congestion to be kept up, which, of course, greatly increases the amount lost at the period. An examination with the sound reveals the cause. The treatment is simple: divide the os uteri externum to make it larger, and, if necessary, cut slightly the sides of the cervical canal; then pass a sound twice a week for a month or two; and, in most cases, the relief, both from hæmorrhage and from pain, will be permanent. It has been so in four of my cases; the other two I have not been so fortunate as to entirely cure, although they are relieved to a great extent from menorrhagia.

11. *Anæmia.*—The last condition to which I intend alluding, as a cause of uterine hæmorrhage, is a general one, and that is anæmia. Although, of course, it is often the consequence of excessive hæmorrhages, yet it is occasionally the cause of excessive menstruation. I have had four cases, of which the following is a typical example. A thin pale girl, aged 17, began to menstruate at fifteen, and has done so about every two or three weeks profusely. No uterine disease could be detected; in fact, the hæmorrhage was more like a constant oozing of blood, and not with much colour. The cases were cured by directing attention to the general state of anæmia, and insisting upon the recumbent position, with the hips raised during the continuance of the menstrual period.

In conclusion, I must ask you to excuse the very short account given of most of the conditions mentioned in my paper; but all I wished to do was to place before you an analysis, as it were, of some of the causes of uterine hæmorrhage, so that it might be of the same assistance to you as it is to me.

ON THE MORBID HISTOLOGY OF THE SPINAL CORD IN FIVE CASES OF INSANITY.*

By RINGROSE ATKINS, M.A., M.D.,

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IN the following communication, I record the appearances observed in the spinal cords taken from the bodies of five persons dying insane; and, though I feel that the recital of histological changes cannot but be wearisome, yet the few references to the condition of this centre contained in the pathological records of insanity, in this country at least, has induced me to trespass on your indulgence; and I can, therefore, only trust that the description which I am about to read of the appearances presented by the specimens, and depicted in the drawings exhibited for your inspection, may not be wholly devoid of interest, as forming a slight contribution to this field of inquiry. In each case, I shall shortly mention the state of the brain also, so as to afford a comparison with that of the spinal cord.

CASE I.—J. G., male, aged 29, single, was admitted into the District Lunatic Asylum, Cork, on April 9th, 1873. The patient, for nine days previous to his admission, had been labouring under great mental excitement, with paroxysms of violence, during which he had committed several unprovoked assaults, and was strange in his manner and behaviour. The mental derangement was attributed to a previous injury to his head. When he came under my observation towards the close of 1873, his mental condition was that of settled melancholy; he was depressed and silent, difficult to draw into conversation, and rarely answered directly any questions put to him, frequently requesting that he might be killed. His expression was gloomy, with a haggard anxious look; he was very restless and uneasy, constantly watching an opportunity to make his escape from the asylum. Physically, he was a weakly constituted young man, with a strong tendency to chest-disease, and used to suffer from repeated attacks of diarrhœa. Since then, the depression and gloom became more fixed, and the desire that he might be killed was constantly present. He progressively emaciated, and

the tendency to lung-disease increased. He had but little cough or expectoration, and no active symptoms; he suffered, however, from recurrences of diarrhœa. He was generally clean in his habits and person. Physical weakness and general emaciation gradually increased, and he died on January 20th, 1877. There were never any morbid disturbances or other indications of *coarse* disease in the brain or spinal cord.

Necropsy forty-eight hours after death.—The body was much emaciated; rigor mortis was little marked. The remains of commencing bed-sores were present over the lower portion of the sacrum and the trochanteric prominences. The scalp was normal, the left lateral surface of the frontal bone somewhat flattened, the calvarium in other respects being normal. The dura mater was healthy, no adhesions or thickening existing. The brain was large; the vessels at the base unaffected; the pia mater bridging the Sylvian fissure was adherent to the cortex; the latter, at the apices of both temporo-sphenoidal convolutions, was diminished in consistence. Over the superior surface of the organ, the pia mater was a little thickened, especially along the sides of the vertical cleft and over the right postero-parietal lobule, where it was white and opaque; the membrane generally was difficult to strip from the convolutions without injury to the cortex. Dissection revealed no gross lesion in the brain-substance or ganglia.

Microscopical Examination.—(a). *Pia Mater.* A portion of the membrane carefully stripped from the summit of a convolution, and immediately immersed in a weak solution of bichromate of potash, as recommended by Dr. Charlton Bastian, while the vessels were still naturally injected with blood-corpuscles, showed the muscular coats to be thickened and dotted with fine granules. [This method of examination affords, I believe, more reliable results than the inspection of stained specimens of the tissue, as, if cautiously manipulated, the real condition of the coats of the arterioles can be much more readily distinguished while the vessels are filled with blood-corpuscles than when the latter are washed out in the preparation of the specimen, the vessels then being empty and transparent, it often becomes difficult to determine the exact boundary-line of their walls.] (b) *The Brain.* Fresh teased preparations, stained with aniline blue-black and examined in glycerine, exhibited the larger pyramidal nerve-cells from the frontal and parietal regions in a more or less granular condition; where the granules were abundant, the basal extremities of the bodies had become rounded and eroded; when, however, they contained but few granules, the angles and processes were generally preserved, and could be traced for a considerable distance; in many cases, to their subdivisions. In no case had the nucleus disappeared or been concealed by the granules. The surfaces of the smaller vessels were dotted with rounded and elongated nuclei. A prepared carminised section of the tissue from the left superior frontal convolution, hardened in iodised spirit and bichromate of potash, showed the coats of the vessels to be fused, and, in some instances, surrounded with an overgrowth of connective tissue; in others, the lumen was filled with an organised plug; they were surrounded by the commonly observed clear spaces (perivascular canals?), which contained, clinging to the walls of the vessels, particles of hæmatoidin and minute granules.

Many of the larger nerve-cells had lost their normal outline, and were shrivelled and yellow, and destitute of their branching processes. Their nuclei were large and slightly coloured by the carmine; the smaller angular and pyramidal cells were generally unaffected. The neuroglia was granular, and contained numerous nuclei and clear spaces left by the disappearance of the disintegrated nerve-cells.

(c) *The Spinal Cord.* The spinal dura mater was normal; on slitting it up, two almond-shaped protuberances were seen on the left postero-lateral aspect of the cord; the upper one, three-quarters of an inch in length, occupied the origin of the fifth dorsal nerve; the lower, more pyramidal in shape, with its base joining the upper elevation, lay between the fifth and sixth dorsal nerves, the latter issuing below it. These eminences on the cord were covered by the pia mater, and were of a greyish-white colour, soft, and apparently composed of nerve-matter. The cord externally presented no further morbid appearances to the naked eye. It was cut into segments and hardened in Hamilton's chromic acid solutions which rendered the tissue very friable and difficult to cut sections from, that part around the central canal being especially so. At the junction of the cervical and dorsal regions, transverse sections coloured with carmine showed the following appearances. 1. The investing sheath of pia mater was considerably thickened, and composed of fine broad and deeply coloured bands of fibroid tissue containing numerous vessels. The septula passing from it into the substance of the cord were, in like manner, thickened from overgrowth of tissue. 2. The vessels following the same direction were also similarly affected, their coats being fused and composed of fine longitudinally running parallel fibres, the muscular layer being apparently obliterated.

* Read in the Section of Psychology at the Annual Meeting of the British Medical Association in Manchester, August 1877. Drawings of the appearances described were exhibited.