there was always a little; and, even when to the naked eye the urine was apparently free from it, numerous blood-discs were displayed by the microscope.

Dr. Cobbold has described the ova of the Bilharzia so carefully, that I will not occupy space by doing so. I am glad, however, to be able to prove that, as to the position of the spine, the first describers were not only not in error, but were free from exaggeration in depicting it occasionally as lateral. Generally, the ova which I observed were symmetrical in form, with the spine at one of the terminal poles—remining one of the spike on Von Moltke's helmet, as seen in the photographs. Sometimes—but rarely, however—it was quite lateral, and growing from the broad face, and not from the narrow edge of the shell.

I may mention also another fact which has not been noticed, so far as I am aware, by previous observers, which is, that the anterior extremity of the embryo has no constant relation to the poles of the shell; the head sometimes being directed towards the spike, sometimes to the plain end.

Passing over all the interesting phenomena attending the escape of the embryo from the egg, and on which my observations accord with those of Dr. Cobbold, I will return to the clinical bearings of the question.

During his stay in the Infirmary, there was no marked change in the condition of the patient; but the hæmorrhage decidedly lessened. There is no doubt that the mucous membrane of the urinary passages had suffered from the inroads of the parasite; and that there was chronic pyelitis, most probably affecting the right kidney. Griesinger found the worm inhabiting the blood-vessels of the bladder, ureters, and kidneys, also the portal and mesenteric veins; and he states that he found empty egg-shells in the blood of the left ventricle. In many cases, the constitution becomes gradually undermined, and death results from pneumonia, diarrhoea, and other disorders. In some of the cases of pneumonia, it is not improbable, as Küchenmeister suggests, that embolism plays an important part.

As regards treatment, it is evident that we must be considerably hampered. The worm lives in the blood-vessels, and can only be acted on by soluble substances carried to it with the blood-stream, and necessarily in a state of considerable dilution. If, however, we can give a remedy sufficiently powerful to kill the parasite, will not the dead worms in the blood-vessels be almost more dangerous than the same guests when living? They will be more liable to be carried on by the blood-current—those in the systemic veins to the right heart, thence to be driven into the pulmonary capillaries, where they may give rise to inflammatory changes in the lungs. Those in the portal vein will, of course, be carried into the capillaries of the liver; and Griesinger strongly suspected some connexion between this parasite and hepatic abscess. The danger, moreover, of septic poisoning from the dead worms, must not be forgotten. Griesinger, our great authority as to these points, gives an illustration of the immense numbers in which they occur, when he says that the portal vein has been found filled with them.

The treatment adopted during the patient's stay with us was chiefly directed to the improvement of his general health. For some time he took quinine with perchloride of iron. For a short period I gave him small doses of turpentine, which, however, produced irritation of the urinary passages, and somewhat increased the hæmorrhage; and, in spite of my better judgment, I gave him some large doses of iodide of potassium, as there is some reason to believe that they have been useful in bringing about the death of hydatid cysts. No doubt the infusion of buchu, as recommended by Dr. Cobbold, would be useful in lessening the irritability of the bladder; but I must confess my scepticism as to the good effects likely to result from the treatment suggested by Dr. Harley. And I cannot but believe that, as to any direct treatment, we are powerless for cure, and must rely on judicious palliation.

On the whole, I think it is clear that the prospect of success lies rather in prevention than cure. It may be long before the people of any country will be so educated as to observe preventive measures; but governments might do something by diffusing a knowledge of what such measures should be, and the reasons for their adoption. The drinking water in Egypt, the Cape, and other countries where this parasite occurs, should of course be perfectly filtered. All vegetables should be well washed; but it would be safer to avoid all salads, and only to use vegetables boiled. All shell-fish should be abjured, or thoroughly cooked; and no fish, though dried or smoked, should be eaten without cooking.

Dr. Harley recommends that "water should be conveyed from its source to its destination in covered channels, so that the urinary and probably the fecal products of those infested with the parasite may be prevented mixing with it." This is desirable for obvious reasons, but not for those given by Dr. Harley, whose views as to the development

of the Bilharzia do not, as Dr. Cobbold very clearly indicates, seem to harmonise with those of the most eminent scientific observers. Our danger lies rather in the introduction of the parasite into the body in one of its intermediate stages between the ovum and the sexually perfect worm, than in swallowing the ova themselves. The question of its possible acclimatisation with us is one not merely of scientific, but of practical moment. Although an inhabitant of climates hotter than our own, we do not know as yet that our temperature is too low for its development, and we have in favour of it the fact that the lower forms of life are usually tolerant of widely diverse external influences. Bearing in mind, therefore, the enormous increase in the number of those who for business purposes, for pleasure, or in pursuit of health, dwell for a time in its present abodes, and then return to us, we may fairly assume that its ova will more or less frequently be freely scattered in our midst. So far as any evidence of which we are in possession at present is concerned, we have probably all the conditions necessary for its development, except temperature. This exception may turn out to be our safeguard, but as yet there is not sufficient proof of it; and we may well believe that it is not impossible, perhaps not even improbable, that the Bilharzia hæmatobia will find a home in this country. I am aware that Dr. Cobbold's experiments do not support this supposition; but, as he says, "the conditions under which the experiments were made departed in several respects from those that are presumably essential to success in the ordinary course of nature."

While in the Infirmary, my patient had several letters urging him to return to Egypt, which he was very wishful to do, and at length one stating that his passage was paid for, etc. This he could not resist; so he left, promising to write on his arrival at Cairo. A letter came in due time, in which he said that his general health had improved much on his journey.

I could only ascertain that he was acquainted with one case like his own, and this was in the person of a native soldier. His opportunities of inquiry would probably not be numerous, and of course the spur of scientific curiosity was wanting. It seems strange that the diagnosis of his case should not, so far as we could learn, be made out by the medical men who saw him, when we remember that, until recently, almost all we knew of the disease was derived from Egypt.

ON THE EXTERNAL AND INTERNAL ORIFICES OF THE UTERUS: THEIR ANATOMY, PHYSIOLOGY, AND PATHOLOGY.*

By J. HENRY BENNET, M.D.,

Late Obstetric Physician to the Royal Free Hospital, etc.

THE subject which I have taken for the present communication is so extensive, it can be viewed and discussed in so many different lights, that a volume might be written on it. My object, however, is merely to lay down a few general anatomical and physiological data, as a basis for treatment in pathological conditions. My hope is, that the discussion of these data at this meeting may establish a little order in the chaos of present practice at home and abroad.

Anatomically, there are two distinct cavities in the uterus; that of the body, the larger one; that of the cervix, the smaller one. It is in the cavity of the body of the uterus that conception and the development of the foetus take place, whilst the cavity of the cervix is a species of antechamber which precedes and protects the more sacred internal precincts. The circular fibres of the body of the uterus converge towards the cervix, are continued throughout its entire extent, and form the greater part of its tissue, half an inch in thickness. These circular fibres of the cervix are endowed with vitality, and with contractility in the cervical canal, even in the non-pregnant state, as is seen on introducing a stick of nitrate of silver, or a solution of nitrate of silver, into the cervical cavity. Its entire extent instantly contracts, so that the uterine sound can no longer be introduced without an effort, although the canal may have been quite patulous before. These circular fibres, in the healthy uterus, surround and form an infundibuliform cavity in the central cervical region; whilst at the outer or vaginal outlet, and also where the cervix passes into the uterine cavity, they are in circular approximation, like the sphincter ani. They thus close the canal in both directions, and resist the effort to enter either cavity with sound or bougie, and that by a vital contraction. In a word, the cavity of the uterus is separated from the cavity of the cervix by a regular sphincter, a fact which I was the first to demon-

* Read in the Midwifery Section at the Annual Meeting of the British Medical Association at Birmingham, August 1872.

strate in 1848; and the cavity of the cervical canal is separated from the vagina by a second sphincter. I do not mean to assert that on dissection a separate band of muscular fibres, assuming the form of a sphincter, can be demonstrated, nor have I ever made such a statement. What I have asserted and do assert is, that the circular fibres which constitute the mass of the thick structure of the cervix uteri, or some of them, contract vitally and perform the functions of sphincters. I would remark that, anatomically, all the great cavities of the body have sphincters—the stomach, the intestinal canal, the bladder. For the uterus not to have one, would be an exception to this anatomical rule.

Physiologically, these sphincters open and close under physiological conditions. Before, during, and after menstruation, the os internum often opens to gentle pressure in cases in which it is impossible, except to force, in the interval of menstruation. In a much minor degree I notice the same fact with the healthy os externum. In all probability they both open, likewise, under the influence of sexual orgasm, thus facilitating the entrance of semen and conception.

On the other hand, the os internum constantly closes spasmodically on the contact of the cold uterine sound, so as to require more or less force for it to pass, and that in the healthiest female. A warm wax bougie of the same size will, however, often pass with gentle continued pressure. The contact of any astringent or irritating substance—alum, zinc, tannin, nitrate of silver—occasions, in a few seconds, such a contraction of the os externum as to effectually close the canal. Closure of the uterine orifices, indeed, is so much the rule in the healthy female, that an open patulous condition of either orifice may be considered to generally imply disease, inflammation, inflammatory hypertrophy, or a fibrous growth.

To me it appears that the above statements are facts, undeniable, uncontrovertible facts; and if so, it is of the most vital importance that they should be generally recognised. In actual practice, we constantly hear of serious operations performed on the uterus by eminent obstetricians or surgeons, founded on the non-recognition of these anatomical and physiological data. Such operations are based on the supposed existence of strictures, which, if I am anatomically right, often do not exist. A remarkable fact connected with the operations the abuse of which I criticise is, that one class of eminent practitioners, such as Sir James Simpson and Dr. Greenhalgh, very frequently divide the os uteri internum as the seat of stricture, and as the cause of uterine suffering of all kinds; whereas other practitioners equally eminent, Dr. Marion Sims and Dr. Emmet, for instance, I believe, think that the os internum proper is seldom in fault, and divide the os externum down to its vaginal attachments in all but exactly the same class of cases. Thus, the practice of each category stands condemned by that of the other.

The division of the os uteri internum for sterility, dysmenorrhœa, etc., was introduced by the late Sir James Simpson more than a quarter of a century ago, and I do not think that, up to the end of his career, he ever discriminated between physiological and morbid contraction of the os internum; or, in other words, that he ever adopted the above view long ago submitted by me to the profession. I certainly have known him, in consultation, declare females to be suffering from stricture, when they presented what I considered to be a mere physiological resistance to the introduction of the sound. Moreover, I have seen many females in whom he had clearly divided the os internum under the same conditions. Indeed, it is well known that the division of the os internum had become a matter of routine with our lamented colleague. I may add that it is so still with many of his followers at home and abroad. Thus, in 1864, Dr. Greenhalgh stated, in my presence, at the Obstetrical Society, that he had divided the os internum in several hundred cases within a few years.

Dr. Marion Sims, on the other hand, in his really valuable work on the *Surgery of Women's Diseases*, seems to think that the os uteri internum can generally be left to take care of itself, and proposes as a remedy for sterility, displacements, and chronic inflammations of the uterus, division of the entire cervical wall on both sides, down to its attachments to the vagina. In midwifery, we are taught to consider laceration of the cervix, during labour, down to its vaginal attachments, a serious complication, and I constantly find it the evident cause and origin of severe chronic inflammatory disease. Yet it is this condition, artificially induced—it is this surgical interference with the natural structure of the uterine neck—that is to remedy sterility, to remove secondary displacements, and to cure chronic inflammatory disease. For myself, I believe that this operation is totally powerless, as a rule, to remedy or even palliate these conditions. Dr. Sims says that he and his colleague, Dr. Emmet, have performed this operation more than five hundred times within a few years in their hospital at New York, and with satisfactory results; but these women should

have been seen a year after the operation. No results obtained by uterine treatment of any kind can be accepted as permanent until after that lapse of time.

It must not, however, be thought that I deny congenital or pathological stricture of the uterine orifices. Far from it, I have myself in many cases cured severe congenital dysmenorrhœa or pseudo-membranous dysmenorrhœa by dilatation of the os internum. But I was not guided, in having recourse to such treatment, by the resistance of the os internum to the sound, an unreliable guide, as we have seen. I have resorted to it in congenital cases because there was no other apparent cause for dysmenorrhœa, but evident narrowness of the passages: in pseudo-membranous dysmenorrhœa, to give a freer exit to the pseudo-membranes; in pathological cases, in chronic inflammatory disease, because the removal of the morbid condition was not followed by spontaneous dilatation of the really narrowed orifice, and by disappearance of the dysmenorrhœa.

As to division of the os externum, I should feel disposed to limit it to those exceptional cases of conoid cervix in nulliparous women, which my friend Dr. Barnes has well described, and in which the orifice of the os internum is preternaturally small. With some women, its rational aggrandisement may certainly facilitate menstruation and conception. But I do not consider it a rational surgical procedure to dilate the cervix, by cutting it in two from apex to base. What surgeon has ever proposed to dilate stricture of the male urethra by dividing the glans or entire penis in two halves?

In conclusion, I would recapitulate by stating that I myself do not consider that there is any positive evidence of abnormal contraction of the os uteri internum if a small wax bougie, warmed and bent to the natural anterior curve of the uterus, passes, on gentle continued pressure, into the uterine cavity. I do not even consider that there is any such evidence on the non-passage of the uterine sound or of the small wax bougie. If there be no dysmenorrhœa, if free painless menstruation exist, the contraction may be vital; it may, and probably does in such cases, relax physiologically at proper times and seasons.

As to the os externum, I see no reason for surgical interference if a good sized wax bougie can be passed easily into the cervical canal. I must confess to being utterly unable to understand how dividing the structures of the cervix, how artificially producing an obstetrical laceration of the organ, can cure these varied diseases. In my opinion the operation, as a routine operation, is a surgical error, and yet it continues to be the routine practice of many eminent obstetricians, and that without the data on which it is founded being given.

In the year 1866, my friend Dr. Tilt read an able paper before the London Obstetrical Society, in which he tried to stem the current of irrational uterine surgery in this direction; but the state of practice appears to me to be nearly the same now as then. I constantly meet in consulting practice, both at home and abroad, females in whom division of one or other orifice has been carried out apparently in a routine spirit, as a mere remedy which may do good. I should wish to see this operation placed on a sound basis; and with that view, appeal to the members of the Association present to help me in clearing up and establishing the anatomical and physiological data on which alone such an operation can rightly rest.

I take advantage—I hope it will not be considered an undue advantage—of the opportunity afforded me by the reading of this paper to briefly narrate two cases which illustrate the subjects discussed yesterday in our section on the reading of the three able memoirs on the treatment of cancer of the uterus.

More than twenty years ago I was sent for by the surgeon of a provincial hospital to see, in consultation with him, the wife of the vicar of the town. She was a woman of about forty, mother of a large family, who had been pronounced to be undoubtedly labouring under advanced ulcerated cancer of the uterus by several obstetric and surgical celebrities. I found all the constitutional symptoms of such a condition; but the uterus was not fixed in the pelvis, whilst the cervix was fissured, lobulated, and the seat of fungoid-looking ulceration. I thought that all this mischief might be inflammatory, so had the patient brought to town, and by the help of potassa cum calce cured the morbid conditions. Health returned, and she is well and alive now.

The fame of this cure spread far and near, and for some years I did a considerable proportion of the consulting work of the town. On one occasion, however, I was sent for to see a lady fifty years of age, who had ceased to menstruate for two years, and in whom an uterine tumour had been casually discovered by the hand pressed on the hypogastric region. I found the uterus enlarged, as in the fourth month of pregnancy, ascending out of the pelvis, perfectly free from adhesions, movable in every direction, perfectly globular, no discharge from the vagina or cervical canal; merely slight hypogastric pains; general health and nutrition perfect. The sound passed four inches freely. I dia-

gnosed a fibrous tumour of the uterus; reassured the patient and friends; told them she might live twenty years; and on return home, unfortunately made the same statement to the family in town. Forty-eight hours after my visit, this patient was seized with peritonitis, and died on the second day. A *post mortem* examination was made, and a large encephaloid cancerous tumour was found in the uterine cavity. I need scarcely add that I ceased to be a prophet in the town in question. My glory departed, and I have never been sent for since. This fact teaches us the advisability of caution in the simplest of cases. I do not even now see how the error I made could have been avoided; but had I given a more guarded opinion, the results might not have been so serious to me in a professional sense. Again, was the peritonitis the result of the passage of the sound, or a mere coincidence?

THREE OBSTETRIC COMPLICATIONS.

By W. DRAPER, M.R.C.S., etc., York.

OF the three following cases, each of which seems to present some points of interest, the first represents a class much dreaded by private obstetricians, and justly so from the frequent untoward issue. The second case affords a good example of a condition not very common in pregnancy—"d Dropsy of the amnion". The third case is an illustration of "early rupture of the membranes", respecting which much has been said of late in this JOURNAL. I am inclined to think that the accident is by no means so uncommon as some recent writers in these pages seem to suppose: certainly the number of cases recorded during the last few months would favour the notion.

CASE I. *Entire Placenta Prævia.*—In October 1871, I was called to see Mrs. S., aged 25, who was in the ninth month of her second pregnancy. I found that she had sustained a sudden and violent loss of blood, but the hæmorrhage had ceased on my arrival. A digital examination of the uterus discovered the cervix in the ordinary condition at the ninth month of gestation. The os was slightly dilated, but not sufficiently so to admit the finger-end; the lower portion of the body of the uterus, as far as it could be reached, felt soft and pulpy; no foetal presentation could be ascertained.

The patient was ordered to bed, and a firm abdominal bandage was applied; the flooding having ceased, further interference was deemed unnecessary. There was no uterine action. For the next four days there was no recurrence of hæmorrhage; but on the fifth day, at 6 P.M., I was sent for in haste, for the patient had suffered another very serious loss: the hæmorrhage, however, had again stopped on my arrival. There were no pains or other signs of labour. The os uteri now just admitted the finger. The vagina was plugged and the bandage reapplied. In spite of this treatment, the flooding recurred after a time. On removing the plug, four hours later, the os was dilated to the size of a florin, and blood was pouring freely from it. The placenta could now be distinctly felt presenting, and closely attached all round the lower segment of the uterus. There was still but very slight uterine action.

Feeling that there was no time to be lost, I dilated the os as quickly as possible with my fingers, until large enough to admit my left hand; and, having detached the placenta posteriorly, both feet were reached, and the child turned by the bimanual method of Dr. Braxton Hicks. Alarming gushes of blood followed the extraction of the breech and body; and on delivery of the head, which was quickly accomplished by means of the vectis, the hæmorrhage recurred with renewed violence. During the whole process of delivery there were but very slight pains; but tolerably good contractions followed the birth of the child. The placenta, which was firmly adherent, was detached and removed without delay, its extraction being accompanied by a further loss. This, however, was happily the last, for the uterus now contracted well under pressure.

The patient was of course much exhausted; but at my first visit a plentiful supply of beef-tea had been ordered to be in readiness, which, with brandy, was given unremittingly during the operation, and to this in a great measure do I attribute the patient's preservation. The child was still-born. The mother made a slow but good recovery.

CASE II. *Dropsy of the Amnion.*—Early in December of last year, I was requested by Mrs. P., aged 28, to attend at her third confinement, expected at the end of the ensuing February. At the time of the patient's visit, I remarked that her abdominal appearance indicated more advanced pregnancy, but she assured me that her calculation was correct. The following evening, however, I was called to see her, and found that there had been slight labour pains all the day. The os uteri was about two-thirds dilated, but so high in the pelvis as to be

only just within reach of my finger. Through the os protruded the distended membranes, but no foetal presentation could be discovered. After waiting for some time, and finding that only very slight progress was being made, I ruptured the membrane, and for what occurred I was not at all prepared. An enormous gush of clear fluid followed; so large was the quantity that the bed and floor were deluged. How much fluid escaped it was impossible to estimate accurately, but I should think from seven to eight quarts at least. After this extraordinary evacuation the uterus contracted well, and a foot presented at the os; the other foot was reached, and both were brought down. The funis was so short that its division was necessary before delivery could be accomplished. Shortly a female foetus of most remarkable appearance was born. Its size was that of a small six months' child; the cervical vertebræ appeared to be entirely absent, the head being fixed on the shoulders without any signs of a neck. The face occupied the position of the vertex, and the parietal bones were apparently deficient. All the features were flattened and stunted; from the posterior part of the head protruded a large sac, evidently the membranes of the brain. The bag, when opened, was found to contain the brain and a large quantity of blood. The rest of the body was normal, though ill-developed. The placenta, being adherent, was peeled off the uterine wall, very little hæmorrhage occurring. The patient was extremely exhausted for some hours after recovery, but she made a favourable recovery.

CASE III. *Premature Rupture of the Membranes.*—In September last I was requested to see Mrs. B., who was in the sixth month of gestation of her third pregnancy. She had experienced some slight uterine pains for a few hours, when suddenly the membranes gave way, and the liquor amnii escaped. There was ample proof of this from the saturated condition of the bed-clothes. The os uteri was but very slightly dilated. An abdominal bandage was applied, and the patient kept quiet in bed. A small opiate was prescribed every four hours. The next day I found that there had been occasional slight uterine contractions during the night; but the patient was free from pain, and feeling quite well at my visit: there was, however, a little dribbling of water from the uterus, which continued for a few days. Uterine action did not recur until nearly a month later, when labour properly set in. When I was called, the os was sufficiently dilated to admit the finger easily, and the foetal head could be distinctly felt, *uncovered* by membrane. There had been no escape of fluid before my arrival, nor was there any to the end of the labour. This fact confirmed the belief that the water had escaped previously. A fine healthy seven-months' child was born in due time. The mother did well.

ON THE OCCURRENCE OF AN UNUSUAL FORM OF PRURITUS DURING PREGNANCY.

By DAVID PAGE, M.B. Edin., Kirkby Lonsdale, Westmorland.

WOMEN frequently suffer, towards the end of pregnancy, from the annoyance of local pruritus affecting the perineal region; but I am not aware that such a complication as that of a general pruritus, involving the whole cutaneous surface and the mucous surfaces of the upper outlets of the body, has been noticed, at least with any degree of special interest. For this reason, I have thought it worth the while to give the details of a case that came under my observation, with particular reference to the treatment which eventually proved successful as a palliative measure.

The patient, a lady aged 34, the mother of six children, of nervous temperament and fair health, was in the seventh month of utero-gestation, when I attended her for gastric disorder, indicated by heartburn and acidity. There was nothing in the nature of this attack to distinguish it from the ordinary dyspeptic symptoms common enough among puerperæ; and it apparently yielded to the action of bismuth and quinine. The gastralgia, however, was followed by a severe attack of facial neuralgia; and, as no relief attended the exhibition of strychnia, either alone in one-twenty-fourth grain doses three times a day, or combined with quinine, including the application of local sedatives, I judged it to be prudent to advise change of air. An excursion to the west coast of Scotland was fixed upon; and, within twenty-four hours after her arrival in Glasgow, the neuralgia, which had been most intense during the journey, ceased, and was superseded by the pruritus about which I now write, the invasion of which began with discomfort and restlessness during the night, owing to the itching of the skin. This was in the month of July last, and within eight weeks of her expected confinement.

On her return home, I found that the whole cutaneous surface was