

uteri should at once impel to follow out all the other modes of investigating this question. The detection of the violet coloration by rousing suspicion of pregnancy will save us from resorting to the sound. For this reason I think it is a good general rule in practice to pursue examination in the following order: 1, by vaginal touch; 2, by speculum; 3, by sound. In many cases we shall stop at the first method, or at the second.

In doubtful cases, examination by rectum should never be omitted. By this route the finger can generally distinguish perimetric effusions by feeling their attachment to the walls of the pelvis, and by defining more accurately the outline of the uterus.

By the sound we can often make out the exact position of a tumor. Thus it may penetrate beyond the normal uterine length behind or in front of the tumor, which may then be felt between the finger or hand by vagina, abdomen, or rectum, and the sound in the uterine cavity. We thus learn in what part of the uterine wall the tumor is situated.

It is chiefly when we have to deal with tumors of considerable size, too big to be retained in the pelvis, that we have to make the diagnosis from ovarian tumor and pregnancy. The difficulty is often increased by the fact that these large tumors cause so uniform an enlargement of the uterus, that the shape closely resembles that of the pregnant uterus. Having excluded pregnancy, which we ought always to be able to do, by carefully collating all the historical data and the physical signs, positive and negative, and especially by the aid of time, which seldom fails to resolve doubts upon this point, we may resort to the sound. By help of this we may generally exclude ovarian tumors. If the sound have to pursue a devious course through the cervix, or if it run to a distance much beyond the normal length along the direction of the tumor, we shall rarely be wrong in concluding that the case is uterine tumor. Or, if the mass is solid, the probability that it is uterine is very great. It must, however, be remembered that in some cases of great enlargement of the uterus by fibroids, the sound will not travel beyond two or three inches. It may also be stated as a general law that when a portion of a tumor projects into the pelvic cavity, it is uterine. In the case of ovarian tumors so large as to rise into the abdominal cavity, the projection of any portion into the pelvis is very rare.

There is one character occasionally present in fibroid tumors especially to be borne in mind when the question lies between these tumors and pregnancy. In a considerable proportion of cases a sound resembling the placental sound is heard. This had been insisted upon by Depaul (*Traité d'Auscultation Obstétricale*, 1847). "Sometimes," says McClintock, "the sound is short and abrupt, a mere whiff accompanying each arterial pulsation. At other times it is prolonged and musical, and not to be distinguished by the most acute and practised ear from the *bruit placentaire*." We should not, then, declare that the case is one of pregnancy on the single evidence of this sign. Nor is it likely, if pregnancy exist, that we shall be reduced to this necessity. Almost invariably some other confirmatory sign will be present. The cases of real difficulty are those where both pregnancy and tumor exist together. The chief character in this complication is the want of uniformity in the shape of the uterus.

In some cases of doubtful diagnosis we may arrive at distinct evidence by dilating the cervix uteri, so as to facilitate exploration of the internal surface of the uterus. Then by sound, or even by the finger, we may feel a tumor forming the projection into the cavity, or we may by finger in the cavity and combined abdominal palpation, take accurate note of the condition of the intervening uterine wall. This mode of exploration is especially indicated when the subject is suffering from hemorrhages. It thus becomes a means of treatment as well as of diagnosis.

Acupuncture, or the aspirator-trocar may be usefully employed. Guéniot has discussed this subject (*Arch. Gén. de Méd.*, 1868). He observes that it gives indication as to sensibility, resistance, hardness of tissue, and the greater vascular development. In a woman, aged fifty-six, a second tumor was discovered immediately after the removal of a uterine tumor, the place of which it assumed. The closest examination left it doubtful whether this was a second fibrous polypus or a partial inversion. The sound penetrated a short distance all round the tumor. Puncture caused no pain. It was concluded to be a fibrous tumor, and was removed with a good result.

Diagnosis may be difficult when the uterus, enlarged by fibroid tumor, is complicated with ascites. In this case a sensation of *ballotement* is felt, differing from the intra-uterine *ballotement* of pregnancy in this, that it is more distinctly felt above the pubes through the abdominal wall.

Malignant tumors of the lumbar glands, peritoneum, and surface of the intestines may also simulate uterine tumors. In these cases we may derive diagnostic indications from the history and general symptoms. It is rare for fibroids of the uterus to be attended by such marked constitutional symptoms as are commonly observed in malignant disease.

Uterine tumors, like ovarian tumors, may be distinguished from tumors arising in the abdominal cavity by tracing them from the pelvis upwards. Tumors of abdominal origin may usually be traced from above downwards, leaving a line or space of demarcation at their lower margin below which there is resonance, marking them off from the pelvis.

In determining the course of treatment, especially the direction of operative measures, it is important to form an opinion as to the part of the uterus an intra-uterine tumors grows from. This may often be done by observing a character pointed out by Dr. Kidd. He says the uterus bulges out most in the wall opposite to that which the tumor is attached. So that feeling a decided prominence, say of the anterior wall, we may predicate with certainty that the attachment of the tumor is at the opposite part of the uterus.

*The Treatment of Tumors, especially Fibroids of the Uterus.*—In discussing this question, it is evidently desirable to keep in mind the properties and natural history of these tumors. The natural terminations furnish the most useful indications. Knowing these terminations we may often assist in bringing them about. These terminations we have seen are: 1. Absorption or atrophy. 2. Calcareous degeneration. 3. Gangrene or other form of decomposition. 4. Spontaneous expulsion or enucleation.

1. Can we aid or bring about the process of *atrophy*? This question

involves the inquiry into the action of internal remedies and local solvent applications. We have seen that tumors have occasionally vanished under the influence of pregnancy and labor. In some of these instances the process of elimination was in all probability inflammation and breaking-down of the tumor; in others, detachment and expulsion; but in others, there seems no reason to doubt that it was true absorption, analogous to that process by which the excess of proper uterine tissue is removed after labor. Then, again, there is the slower atrophy of advancing age. Can we set up or accelerate similar atrophic processes? Before entering upon this question, it is desirable to discuss a very important practical question which not infrequently comes before the physician.

*What is the Risk of Marriage to a Woman known to be the subject of Uterine Tumors?*—I have discussed this question in my work on *Obstetric Operations*, and can only give the general conclusions in this place. All authors agree in the opinion that pregnancy brings serious danger; and all agree in discouraging those who are the subjects of uterine tumors from marriage. This is certainly the wiser course. Apart from the dangers attending pregnancy, the increased afflux of blood and consequent developmental force excited under the conditions of the married state give material impetus to the growth of these tumors. Metrorrhagia will probably be increased. And, although fibroid tumors act in many cases as an obstacle to impregnation, still pregnancy often occurs notwithstanding. If pregnancy and labor are occasionally observed to be followed by the atrophy or expulsion of the tumors; and if, as is even more frequent, no accident occur to interrupt the smooth course of pregnancy, labor, or childbed, the tumors remaining unaffected, the accidents in other cases are so serious that we shall rarely be justified in sanctioning disregard of the established rule. In cases where we can clearly determine that the tumors are seated in the substance and projecting on the peritoneal surface of the fundus of the uterus, we may predicate that the risk is small. But where tumors are found in the lower segment, and especially if projecting into the cavity of the uterus, the danger is so great that we are bound to prohibit marriage with all the authority we possess. Tumors in this situation are doubly dangerous; they are exposed to bruising and tearing during the passage of the child; they may descend before the child into the pelvic cavity, and obstruct labor.

Medicines have been given with the four following designs: 1. To promote absorption or calcification. 2. To restrain growth. 3. To restrain bleeding. 4. To promote extrusion.

*Medicines designed to promote absorption and to restrain growth* may fitly be considered together; and some agents which are chiefly given for their supposed efficacy in restraining hemorrhage probably act also by promoting extrusion. Simpson, Rigby, and others were very positive as to the absorption of fibroids. A true *fibrous* tumor will hardly disappear spontaneously; but muscular tumors rapidly grow and rapidly disappear. The cellular spaces between the fibres of these tumors may become filled with serum; and that portion of the tumor thus due to oedema may undoubtedly disappear. In such cases Wells thinks the use of bichloride of mercury is often followed by remarkable diminution. Simpson praised the bromide of potassium. Where there is much irreg-

ular bleeding, Wells agrees with McClintock in regarding chloride of calcium as of great value. This remedy had been introduced by Rigby in 1846. He says he "found that, if commenced in ʒss doses of the solution twice a day, the patient could gradually increase it until she had reached ʒj without inconvenience. After continuing at this dose for a month, she left it off for a few weeks, and again resumed it as before; a decided change was observable in several cases." McClintock relates a case in which complete cure was effected by this remedy combined with perchloride of iron. Wells, however, has found that, if persisted in for a length of time, the chloride of calcium is apt to bring about calcareous degeneration of the arteries generally; and this is so real a danger that the remedy must be used with great caution. Its action in arresting the growth of fibroids probably depends upon this property. The tumor perhaps has a greater affinity for the chloride of calcium than have other structures; and if the calcareous deposit could be limited to it, the remedy would be without a drawback.

Rigby further possessed great faith in the Kreuznach water. Adopting the suggestion of Dr. O. Prieger, he tried this water in a very concentrated form, and believed he increased its efficacy by adding from two to five grains of bromide of potassium. "In many cases," Rigby says, "the results have been very successful; in some, where this artificial mineral water formed the sole treatment; in others, where it was combined with the local application of leeches and mercurial ointment." But West and Scanzoni doubt whether the Kreuznach waters have cured a single case.

The remedies applied in the hope of restraining growth are the same as those designed to promote absorption. It may be reasonably expected that greater success would be attained in accomplishing this lesser result. Observations upon this point are, however, even more fallacious. If we can demonstrate a sensible diminution in the bulk of a tumor, and even follow the diminution on to complete disappearance, the only doubt as to the reality of absorption rests on the possibility of an original error of diagnosis. The supposed tumor might have been retro-uterine hæmatocele, an enlarged body of the uterus from hyperplasia, or some other condition. That some cases of cure by absorption reported before the characters of retro-uterine hæmatocele were known were falsely interpreted is highly probable. But the reality of fibroid tumors having been absorbed is too well established to admit of doubt. Depaul and Béhier relate cases of absorption in non-pregnant women (see *Pozzi*). It does not, however, follow that this absorption was due to the remedies employed. In some cases of absorption no treatment deserving consideration was adopted. And in the rest in which internal remedies were used, doubt as to their share in the result is not unjustifiable. My own experience lends little or no support to the proposition that internal remedies exert any influence in promoting absorption of the hard fibroid tumor. I suspect that the favorable opinions as to their efficacy, which some authors have expressed, spring from the observation of the larger, looser-textured tumors, and that the diminution was due to the absorption of fluid infiltration, the solid constituent remaining untouched.

Sustained pressure, as by means of an abdominal belt, may be useful

in promoting the absorption of infiltrated fluid. It is doubtful whether it exerts much influence in diminishing the solid constituents. It may, however, be useful in supporting the mass, and in preventing injurious dragging.

The ergot of rye has also been used with this indication. It has been supposed that nutrition might be arrested by the constricting action of the ergot upon the vessels feeding the tumor; and by the compression exerted upon the tumor by the contraction of the muscular wall. Hildebrandt (*Berlin. Klin. Wochenschr.*, 1872) practised sub-cutaneous injection of ergotin. (See also a Memoir by this author, *Amer. Journal of Obstetrics*, 1875.)

The evidence in reference to this practice is not conclusive. Byford sums up (*Trans. of Amer. Med. Assoc.*, 1875) one hundred and one cases in which ergot was used. Of these twenty-two were reported cured; thirty-nine have been attended by diminution in bulk; in nineteen the hemorrhage was lessened; and in twenty-one the result was *nil*. Atthill (*Irish Hosp. Gaz.*, 1874) procured some benefit in one case; in two cases severe inflammation caused the patients to refuse further treatment. Hildebrandt's method is as follows: He prepares a fluid consisting of Wernich's watery extract of ergot 3.0, glycerine and distilled water, of each 7.5 parts. Of this he injects about forty minims *deeply* into the subcutaneous tissue of the abdomen. Done in this way, he says, abscess does not occur. The injections must be repeated daily or two or three times a week over two or three months. Failure, says Hildebrandt, is rare in fitting cases steadily treated. It is of no use in old hard anæmic tumors, or in sub-peritoneal tumors. And Spiegelberg points out that only the non-encapsuled tumors can be influenced.

But more frequently ergot has been used with the object of promoting the expulsion of the tumor. The evidence of its use in this way is decisive. Byford gives some good examples.

In a case seen with Spencer Wells (1877) a very large fibro-myoma fell into necrosis within forty-eight hours or less after dilating the cervix with laminaria-tents and the use of ergot. The tumor at its lower part had become quite diffuent, hanging in shreds; higher up it was still solid. Its connections with its capsule were softened by the necrotic process. It was enucleated with some difficulty. The subject promised well for a time; but ultimately sank from septicæmia and phlegmasia dolens.

Atlee advocates (*Trans. of International Med. Congress, Phil.*, 1876) the combination of chloride of ammonium with ergot, and says he is satisfied that he has seen fibroids disappear under its use.

The fallacies which weaken any conclusion as to the influence of remedies in arresting the growth of fibroid tumors are: 1. That these tumors are often of extremely slow growth, so that any change in size within even a considerable time would be difficult to appreciate, and still more to prove. 2. That many of these tumors, when they have reached a certain size, exhibit no tendency to increase, but remain stationary, although no treatment is employed. 3. That in a large number of instances there is a natural tendency towards inertness or even retrogression after the climacteric; and that since these tumors frequently do not

come under treatment until this period is approaching, such treatment may be merely coincident with the natural process of cure, not conducive to it. 4. That the diminution in size may be apparent rather than real, being simply due to the absorption of serous infiltration. And, lastly, the most persistent use of remedies in many cases has not been followed by any sensible alteration in the hands of many competent observers.

Cameron, citing the Indian practice of attempting to bring about absorption of enlargements of the liver and spleen by punctures with long stilets, suggests that *acupuncture* may be of service in uterine fibroids. I am satisfied that this method has promoted absorption of perimetric deposits.

Electricity has been used. It is probable that this plan by which puncture is combined with the influence of electricity may give good results.

Treatment designed to *restrain hemorrhage* may fitly be considered in connection with that designed to promote absorption or to check growth of fibroid tumors. Treatment for this purpose consists of internal remedies, of local applications, and of surgical operations. The principal internal remedies have been already described. To chloride of calcium and ergot may be added strychnine, quinine, digitalis, hamamelys, turpentine, Indian hemp, the lead and opium pill, alum and gallic acid—all agents of unquestionable efficacy as hæmostatics. They now and then act satisfactorily, but much more often they fail. Small doses of mercury have in some cases been attended with success.

*Local styptics*, on the other hand, may almost always be relied upon to stop hemorrhage for the time. Of these the best are, perchloride or persulphate of iron, chromic acid and nitric acid, or iodine. Their efficacy depends upon their being applied directly to the bleeding surface, that is, to the mucous membrane of the uterus, as well as to that immediately covering the tumor. To accomplish this, it is necessary in the first place to obtain free dilatation of the cervix uteri. This preliminary dilatation can be effected by means of laminaria or sponge-tents left in for several hours, or by incisions of the cervix. If the canal is tortuous, incisions will be necessary, at least in the first instance; and sometimes it will be desirable to resort to both incisions and tents.

The *effects of mechanical pressure* may sometimes be obviated by lifting the tumor out of the pelvis. The uterus with its parasitic growths may be movable *en masse*. Sometimes the hand in the vagina or rectum may liberate the pelvis. But more often, a method used with success by Dr. G. H. Kidd is better. The patient is placed in knee-elbow position, and one of my dilating bags is placed in vagina or rectum, which, made to expand below the tumor, gradually raises it. This proceeding would also be effectual by relieving the bowel from obstruction, in removing the flatulent distension which sometimes drives the tumor down into the pelvis. Or, where flatulence is extreme, and the tumor cannot be moved or extirpated, relief may be given by puncture by a fine trocar into the intestine, as was done by Dr. Kidd. In a case he relates a great escape of gas took place. A candle brought near, the gas took fire, burning with a blue flame. Next day the bowels acted freely.

It is a remarkable fact that *dilatation of the cervical canal* alone is in

many cases followed by arrest of hemorrhage. Baker Brown, Nélaton, and McClintock have established this fact as to the effect of incisions in the cervix. I have in so many instances practised this operation with advantage that I entertain no doubt of its value. It does not appear to be necessary that the tumors themselves should be cut into. The incisions should not be deep; they should especially not be carried deeply into the neck at the level of the os internum. Incisions made in this way have appeared to me to exercise a beneficial effect in modifying the nutrition of fibroid tumors; a free os uteri externum will often, as we have seen, when studying the history of dysmenorrhœa and menorrhagia, relieve these symptoms. I have acquired the conviction that these incisions have even arrested the growth and promoted the absorption of uterine fibroids.

But supposing that dilatation, whether by knife or tents, is not followed by arrest of bleeding, the road being open, we now apply the styptic. This is best done by means of a swab. A probe mounted on a wooden handle, or the instrument made to carry nitrate of silver (see Fig. 50, p. 154) answers perfectly. Around the end a little cotton-wool is twisted; this is steeped in the styptic fluid, and carried quite into the cavity of the uterus and pressed steadily against the inner surface. It is desirable to have three or four of these probes mounted with cotton-wool, using one or two of them first to wipe out the blood from the interior of the uterus before introducing the styptic. To facilitate this introduction, and to obviate the inconvenience of losing much of the action of the styptic in its passage along the cervix, we may resort to one of two expedients. Using a bivalve speculum, which brings the os uteri down within easy sight and reach, seize the margin of the os with a Sims's hook or a vulsellum, so as to steady and hold open the cervix for the passage of the styptic; or the tube (Fig. 52, p. 155) answers better still. By it the styptic can be carried directly into the uterus.

The perchloride or persulphate of iron should be used very strong, nearly concentrated. The chromic acid crystals should be simply moistened with a little water. This is a very powerful styptic. The nitric acid should be used fuming. The acid mostly acts as a superficial styptic or caustic.

Dr. Savage extols strong tincture of iodine. If we find swabbing inefficacious or not to be carried out, then the best thing to do is to inject a solution of persulphate or perchloride of iron. Of course it is eminently desirable that the cervix should be dilated; but we are supposing this not feasible, and that the hemorrhage is so serious as to threaten life. In such a case a vulcanite tube may be passed into the uterus, and two or three ounces of a solution of perchloride of iron or of the persulphate may be injected by means of an india-rubber ball which can be adapted to the tube. This will rarely fail. I have saved several lives by this treatment. Dr. Kidd, I am bound to state, says that "in his experience the injection of perchloride of iron is the least useful and the most dangerous treatment. The last case in which he tried it proved fatal. The woman got a low form of metritis and died." I have not myself seen any ill effect from it. I have cited in detail the history of a case ending fatally from injection of perchloride of iron into a uterus dilated by retro-

flexion. But surely we ought not to be deterred by this risk from the immediate and urgent duty of saving a woman from bleeding to death.

Should bleeding have brought the patient to extremity, there is still a resource in transfusion. Dr. Gentilhomme relates an interesting case (*Gazette Hebdomadaire*, 1868) in which life was saved by this operation.

The preceding means should be steadily persevered in, combating symptoms as best we can, striving to support the patient against them until the climacteric period, when we may reasonably hope that the tumors will pass into degeneration or atrophy, or at any rate become inert. It is only when the patient's condition is so serious that we cannot afford to temporize, and these means can no longer be trusted to, that we shall be justified in resorting to the more decided but more hazardous surgical proceedings which we have now to discuss.

We have lastly to consider *the means of getting rid of the tumors altogether*. This embraces the discussion of the various proceedings available for promoting their expulsion; for causing their destruction and elimination by setting up inflammation or necrosis; for ablation by enucleation, avulsion, ligature, knife, scissors, écraseur, cautery; and for removing the uterus itself along with the tumors by gastrotomy.

The idea of *enucleation* seems to have been first clearly discussed by Velpeau. It was practised by Amussat, and had some vogue afterwards. L. Boyer, A. Bérard, Maisonneuve, Lisfranc practised it. But numerous fatal issues brought it into discredit. It has been several times revived. Simpson especially may be mentioned. And quite recently several enterprising surgeons have renewed the practice. Were it possible to collect faithful reports of all the cases in which the operation has been attempted, I fear we should not derive much encouragement to persevere in this direction.

The tumors justifying attempt at enucleation may, as Atlee describes (*Trans. of International Med. Congress, Phila.*, 1876), be classed under, 1. Tumors already polypiform and in the vagina, or tending to pedunculation and still remaining within the uterine cavity; 2. Interstitial submucous fibroids; 3. Interstitial fibroids proper.

1. *Fibroids more or less Pedunculated*.—The means for bringing about enucleation and expulsion may be conveniently described together. The larger tumors whose texture is continuous with the uterine wall, are not proper subjects of these proceedings. It is from not bearing in mind this fact, which has been so distinctly insisted upon by Rigby and McClintock, that failure and disaster have so often followed surgical proceedings. And since the difficulty of diagnosis between these and the encapsuled tumors is great, the subject is involved in doubt at the very threshold. These processes, then, are chiefly, if not exclusively, applicable to the hard fibroid bodies which are encapsuled. Expulsion may be accomplished without enucleation. This occurs in those cases where the tumor is thrust out of the wall of the uterus, becoming a polypus. A polypus after hanging for a time by a pedicle may be thrown off altogether, a thin capsule of uterine tissue carried before it still investing it. Or expulsion may be effected by spontaneous enucleation. The investing capsule may ulcerate, and uterine contraction going on, the tumor loosened, may be thrown out.

The processes of expulsion may be aided by the use of so-called oxytocic remedies. Treating the tumor-bearing uterus as we would the child-bearing organ, we give certain remedies that possess the property of provoking or strengthening the uterus to contract. The chief of these are ergot, quinine, strychnine, galvanism. The action of these agents upon the uterine muscle, even in the non-pregnant state, is undoubted. But they cannot be expected to act so efficiently as in pregnancy when the muscular fibre is highly developed, and when the nervous centres are in a peculiar state of tension ready to respond to comparatively slight excitation. The remedies must therefore be given over a considerable space of time. And generally they cannot be trusted to alone. It is commonly necessary to dilate the cervix freely by incisions and tents; and if we find the tumor or tumors projecting into the uterine cavity, to seize them with a vulsellum, to draw them down, to try enucleation by scratching through the capsule at the margin of uterine attachment, or even by aid of scissors making nicks into its substance. Under this manipulation of combined traction and incisions, the tumor will sometimes come away. But this result will rarely be accomplished at the first trial. Several sittings may be necessary. If the attachment be very firm it is not unlikely that in dragging down the tumor partial or complete inversion of the uterus may be caused. In such a case the greatest care is necessary in the subsequent steps. In applying a wire we might easily include a portion of the body of the uterus. This has been done with a fatal result. The space between base of tumor and uterus may be too short and ill-defined, to admit of the adjustment of a wire. In such a case Atlee's advice is to divide the capsule high up and attempt enucleation.

Where the tumors seized with the vulsellum can be surrounded at the base with a wire, it is best to remove what we can by the *écraseur*. In some cases if the loop of wire can be made to bite beyond the equator or greatest diameter of the tumor, when the screw is turned on the loop naturally closing in on the farther or uterine side may actually effect enucleation.

The wire used for this purpose should be firm, like a piano-cord, of steel, so that the loop can be passed into the uterus compressed in an elongated form, and will open out again when released from pressure into an oval or circular shape that will run over the tumor. Carried in an *écraseur* the end of this instrument is pushed on to the base of the tumor, whilst a finger applied to the wire-loop guides this down over the tumor until it has got beyond the greatest diameter; and then the loop is drawn in by the screw and made to divide the tumor at its base (see Fig. 164). The tumor may then be taken out by the vulsellum or the fingers. When the wire loop cannot be slipped over the tumor by the finger, it is convenient to use a little crutch on a long stem, which seizing the wire can be made to push it up towards the fundus of the uterus.

2. *Sessile or Sub-mucous Fibroids.* Enucleation failing, the tumor will be divided by the wire flush with the inner surface of the uterus. Then one of three things may happen: 1. The tumor may heal, cicatrize at the incised surface; but the hemorrhage will in all likelihood cease, and relief be gained for a time. To lessen the risk of hemorrhage a plug of persulphate or dialyzed iron should be applied after the operation. 2.

Slow inflammation or necrosis is set up in the attached portion of the tumor, and its capsular attachments losing their vitality, the tumor is cast out. During this process, there is sometimes continuance of pain due to the spasmodic action of the uterus, offensive serous discharge, and possibly some degree of irritative fever. All this trouble ceases when the residuum of the tumor is expelled. 3. Inflammation may extend from the tumor to the uterus itself, and pyæmia added to metritis may try the constitution to the utmost. But this third event is exceptional. These tumors bear a great deal of rough handling without entailing any serious consequences. During this process aid should be sought from the expulsive action of ergot and quinine. These agents further give some protection against septicæmia; and twice daily the uterus should be washed out with a stream of carbolized water or a weak solution of iodine.

In some cases enucleation of even large tumors may be effected by the hand alone or aided by the knife or scissors. After free dilatation of the cervix has been secured, a hernia knife guided by a finger *in utero* makes a long incision into the projecting part of the tumor dividing the capsule. Then the finger insinuated between the solid tumor and its investment may shell it out.

In other cases more difficult, we may succeed in removing a large tumor, one even too large to be drawn unaltered through the pelvis by the process called "spiral elongation." Seizing the most accessible part of the tumor by a vulsellum, and by its means dragging the tumor as near the vulva as possible, aided by supra-pubic pressure by an assistant, a series of incisions are made in the tumor in a spiral or oblique direction. Under the combined effect of dragging and these incisions the tumor is drawn out, it elongates, so that fresh incisions can be carried successively into higher parts of it, until we reach the last part, when all comes away. I have practised this operation successfully.

Sometimes the removal of a tumor can only be effected piecemeal. Wedge-shaped pieces are cut, or torn away, or the *écraseur* takes away portions successively. In this manner, removing gradually the obstructing parts of the tumor, we work towards the base. Analogous to this method is "gouging" practised by Baker Brown.

Bleeding seldom complicates these proceedings in a dangerous degree. When it is at all copious it may be arrested by swabbing the surface with perchloride of iron, nitric or chromic acid.

It has been sought to bring about the destruction of a fibroid tumor and its enucleation by the action of *caustics*. Simpson thus made an opening in the capsule of a tumor at the most depending point; ergot then exciting uterine contraction, the tumor was gradually driven down through the opening, and it was eventually taken away by the hand. The patient died of pyæmia on the sixth day. Koeberl inserted perchloride of iron into fissures made by incisions.

#### *Actual Caution—"Igneous Hysterotomy."*

Dieulafoy, of Toulouse, in 1848, destroyed an intra-uterine fibroid, after dilating the cervix, by thrusting into it a red-hot iron. Recovery ensued. Abeille (*Traitement des Maladies Chroniques de l'Utérus*)

cites other examples. Abeille again (*Fibromes Interstitiels de l'Utérus*, 1878) relates six cases of his own, all successful, in which he enucleated tumors by red heat. Greenhalgh related five cases (*Medico-Chirurg. Trans.*, 1876); of these three recovered, not without threatening danger, and two died, one of peritonitis and one of embolism. It is contended that to attack these tumors by actual cautery is safer than by other means; that the risk of sloughing and of septicæmia is less. This is probably true; but the proposition must be accepted with reserve. In attempting the enucleation of an encapsuled tumor by cautery, necrosis of the tumor is a necessary condition; and it does not seem certain that necrosis started by cautery can be more exactly controlled than can necrosis started by other means. This danger attends all attacks upon the structure of these tumors.

3. *The Interstitial Fibroids proper.*—Unless life is threatened by otherwise uncontrollable hemorrhage, operative measures must be refrained from. They often attain great size. As Atlee says, it is precisely in these cases that the hypodermic injection of ergot is the most effectual. He recommends that the ergot should be used periodically in anticipation of the menstrual effort, associating with it the continuous use of chloride of ammonium. In extreme cases of hemorrhage, Atlee advises “a bold free incision through the muco-muscular envelope of the tumor and through its proper coat, burying the knife into the fibroid substances. This will commonly arrest the bleeding. Enucleation may then be tried.

Atlee, in a “Report on the Surgical Treatment of certain Fibrous Tumors of the Uterus heretofore considered beyond the resources of art,” published in 1854, described a method for bringing about destruction by disintegration of the tumor as a part of the process of enucleation. “A section made through their thin investing membrane will sometimes be followed by the death of the whole mass. This may be owing to the admission of air causing it to degenerate. Indeed it would appear that the action of the oxygen of the air, like a portion of yeast in a fermentable mass, may originate in any part of a fibrous tumor an action of *eremacausis* which may extend throughout the whole.” It is needless to discuss the theory here expressed as to the process by which the vitality of the tumors is destroyed. The important point is to examine the results. The history of the cases reported in this memoir did not afford much encouragement to follow the practice. The real process is no doubt the low kind of inflammation leading to necrosis, to which we have so often alluded.

*The Removal of Ovarian Stimulus by so-called “Normal Ovariectomy.”*—Assuming that uterine tumors are governed in their growth by the ovarian function, it might be expected that the removal of the ovaries would arrest the growth and promote the retrogression of uterine tumors. Acting on this hypothesis, the ovaries have been amputated. Battey, who seems to have been the first to propose, or at least to practice “normal ovariectomy,” did so with the view of relieving various disorders, nervous especially, associated with aberrant ovarian function. He reports ten operations, in some of which one, in others both ovaries were removed. In one case he operated by abdominal section, in the rest by the vagina, opening Douglas’s pouch, drawing down the ovary, cutting it off by

scissors or *écraseur*, and securing the stump by ligature. Two of his patients died. In five, distinct benefit was obtained. In two or more it was found that the ovary was in an early stage of cystic degeneration. One case bears upon the present discussion. A woman, aged thirty-eight, suffered from “threatening mania.” Both ovaries were removed by vaginal incision and *écraseur*. The mental condition was “strikingly improved.” The uterus, which was of full size at the time of the operation, and continued so for a year afterwards, in the succeeding eighteen months underwent an extraordinary hyperinvolution, until it was no larger than that of a child six years old” (*American Gynecol. Trans.*, 1876).

Hegar (*Med. Times and Gazette*, 1877) has in two cases removed both healthy ovaries, in order to bring on the climacteric, and so stop hemorrhage from uterine fibromas. Both patients recovered. Nine months afterwards the hemorrhage had not recurred, and the fibroids were reduced in size. Trenholme (*American Gynecol. Trans.*, 1876) reported a successful case in this connection. Marion Sims (*Med. Times and Gazette*, 1877) has also written favorably of the proceeding.

It is perhaps premature to offer an absolutely adverse opinion upon this operation. Peaslee and Emmet, speaking from observation *ad hoc*, as well as with the authority justly due to their vast general experience and their steady judgment, accorded it only a qualified sanction. With reference to the application to uterine fibroids, it must be admitted that it is supported by physiological facts, and to some extent by clinical experience. It may be justified as a less severe proceeding than the entire removal of the uterus in some extreme cases where this measure would otherwise appear to offer the last hope; and perhaps in some cases even less urgent. But in these cases the comparatively simple proceeding of removing the ovaries through the vagina would rarely be practicable. Laparotomy would be necessary; and this being done, the opportunity of judging whether it would not be preferable to remove the uterus as well would be present to the operator.

4. When tumors—and here we are mainly concerned with the fleshy and fibro-cystic kinds—are so large as to forbid attack by the vagina, and yet are endangering life by hemorrhage, by pressure, or other processes, the *ultima ratio*, removal of the uterus and tumors *en masse* from above by means of abdominal incisions, may become justifiable.

Péan and Urdy<sup>1</sup> trace the history of *laparotomy* for the removal of uterine tumors through three distinct periods. The first, which comes down to 1843, comprises those cases in which surgeons having opened the abdomen with a view to ovariectomy, finding the tumors to be uterine, shrank before the consequences of amputation of the uterus, and closed the wound. In the second period, that of trials and groping, which comes down to 1863, during which ovariectomy had made great strides, several surgeons, Atlee, Heath, Charles Clay, Parkinson, finding uterine tumors where they expected ovarian, yet did not hesitate to remove the uterus. In the third period, beginning with April, 1863, Koeberlé, in the presence of a doubtful case prepared for either ovariectomy or hysterotomy. Storer,

<sup>1</sup> *Hystérotomie: Étude sur les tumeurs qui peuvent nécessiter cette opération.* Paris, 1873.