

## **The use of nitric acid in the treatment of uterine disease / Lombe Atthill.**

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Atthill, Lombe, 1827-1910.

### **Publication/Creation**

[Place of publication not identified] : [publisher not identified], [1873?]

### **Persistent URL**

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ON  
THE USE OF NITRIC ACID  
IN THE  
TREATMENT OF UTERINE DISEASE.

BY LOMBE ATTHILL, M.D.

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of the Dublin Obstetrical Society.

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MOST British gynecologists are now convinced of the advantages to be derived from the application of remedies made directly to the inner surface of the uterus, when the mucous membrane lining the cavity of that organ is in a diseased condition. Much uncertainty, however, yet prevails—first, as to the cases requiring intra-uterine medication ; secondly, as to the best mode of making these applications ; and thirdly, as to the agents capable of producing the most satisfactory results. These important questions can only be solved by careful observation, and by as carefully recording the facts observed.

It may, I think, be considered as certain that no single method and no single agent can be satisfactory in all cases. It is therefore to be hoped that, disabusing their minds of preconceived ideas or prejudices, observers will from time to time publish particulars of the cases in which intra-uterine medication has been practised by them, of the means employed, and of the results obtained.

In the present paper I propose briefly to give the particulars of a few cases in which I have employed one agent—namely, nitric acid, hoping on a future occasion to refer to others, the value of which I am at the present time engaged in testing.





CASE I.—Nitric acid was the agent I first employed in the treatment of disease of the cavity of the uterus. The patient was a young married woman, suffering from profuse menorrhagia ; the cervix uteri was soft and swollen, the vaginal surface deprived of its epithelium and covered with large vascular *papillæ* ; the os uteri was patulous, the mucous membrane lining the cervical canal being also evidently in a diseased condition. I applied the solid nitrate of silver repeatedly to the vaginal surface of the cervix, introducing it also into the cervical canal to the depth of an inch. Little if any improvement however followed. Then, suspecting that the disease extended into the uterine cavity, I introduced a sea tangle tent, on withdrawing which, I passed up to the fundus a stilette armed with a film of cotton saturated with the fuming nitric acid. The application did not cause any pain. From that day this patient improved, and finally was restored to perfect health. This case occurred some years ago, and was the first in which I ventured to introduce caustic into the cavity of the uterus. The patient, a lady, still occasionally consults me for other ailments. She has never become pregnant, but is free from any symptom of uterine disease.

CASE II.—The next in order of time was that of a woman whose case is alluded to in my Lectures on Diseases of Women, page 180. She was suffering from profuse menorrhagia of many years' standing. The uterus was so much enlarged that I was of opinion it might contain a polypus ; accordingly I dilated the cervix. On introducing my finger into the uterus, however, I found that no tumour existed, but that the mucous membrane lining the cavity was in a roughened granular condition. In this case the uterus was drawn down by means of a vulsellum, the os uteri exposed to view with a duckbill speculum, and the whole of the uterine cavity effectually swabbed over with the fuming nitric acid, introduced on a roll of cotton attached to a stilette. No pain was subsequently experienced.

A remarkable feature in this woman's case was the extreme irritability of the bladder. For years she had been obliged to micturate every hour, even at night ; and it was for



the relief of this even more than for the cure of the menorrhagia that she sought admittance into hospital. The night following the operation this woman slept without an opiate for hours, being the first night for years in which she had enjoyed a sound sleep.

This patient too has been under subsequent observation, and remains after an interval of some years perfectly free from any other distressing symptoms.

CASE III.—The following case, though also previously published (*Dublin Journal of Medical Science*, Jan. 7, 1873), is of sufficient interest to warrant mention here. The patient was a widow, aged forty-nine; her illness appeared to have originated in the sudden suppression of menstruation ten years previous to my seeing her. She suffered much at that time from headache and dizziness. These symptoms yielded to treatment, and menstruation was re-established; but the periods subsequently became very profuse and attended with severe pain. Finally she suffered from constant pain in the left side, felt most intensely at a point midway between the spine and crest of the ilium. This pain, at first experienced only during each menstrual period, became after a time constant, being aggravated in intensity during the periods so as to be then absolutely intolerable. On examination the uterus was found to be enlarged, tender to the touch, and retroflected; the introduction of the sound caused much pain. The cervix was engorged. To relieve this I punctured it and abstracted a good deal of blood. The result was that the cervical engorgement was removed, menstruation became somewhat less profuse, and the ovarian pain much mitigated in severity; but treatment having been discontinued for a short time, the whole train of distressing symptoms returned, and I became convinced that no permanent relief would be obtained unless I treated the interior of the uterus directly. I accordingly dilated the cervical canal freely, so as to permit me to pass my finger through the os internum and up to the fundus of the uterus; as I had anticipated, I detected a rough, granular condition of the lining membrane. The lip of the uterus was then seized with a vulsellum and drawn down,



and a wire armed with a roll of cotton thoroughly saturated with the fuming nitric acid was passed up to the fundus and retained there for some seconds. This was done twice, so as to secure a thorough cauterization of the whole interior of the uterus. No pain followed. I kept the patient in bed for some days as a precaution, but no other treatment was adopted. The next period came on a little before its time and was profuse, but attended with less pain than previously. Since then her condition has steadily improved; the periods now last but three or four days, and are almost painless. This lady had been treated in various ways, without benefit, before she came under my care. I may here remark that if the nitric acid be applied shortly before a menstrual period, that period is likely to be profuse; but this by no means indicates that the treatment is a failure, the subsequent ones, as in the present instance, frequently becoming normal.

CASE IV.—In the following case the results were less marked. A lady, aged thirty-five, confined of her last child three years ago, was while menstruating stunned by the news of the death of a relative to whom she was devotedly attached; the flow was at once checked, and from that time menstruation has been irregular in its recurrence, scanty, and painful. She suffered from pain referred specially to the right ovary, and to the edge of false ribs on that side, also from pains in the *mammæ*, especially at the menstrual periods, from lassitude, headache, and incessant nausea. Menstruation appeared not only irregularly, but the flow was also interrupted, coming freely one day, then ceasing, to reappear the following day. The uterus was on examination found to be enlarged, the sound penetrating to the depth of  $3\frac{1}{2}$  inches; the fundus was globular, heavy, and tender to the touch. Its position varied almost from day to day, one day being acutely retroflected, another anteflected to an equal degree; the cervix was soft and congested, and the os patulous; there was a moderate amount of glairy cervical leucorrhea present. The sound passed with great freedom into the cavity of the uterus. Its presence there, however, caused pain. The diagnosis was enlargement of the uterus, depending on endo-metritis with



ovarian congestion and mammary sympathies. As preliminary treatment, leeches were applied to the anus, the congestion of the cervix was lessened by puncturing, and bromide of potassium was administered in 25-grain doses. Subsequently, on the 12th December, the cervical canal was freely dilated by the introduction of five pieces of laminaria bougies, on the withdrawal of which, the cervix being guarded by the use of my intra-uterine speculum, the cavity of the uterus was freely cauterized with the fuming nitric acid. No pain followed the application. The patient was kept in bed for four days, as a precaution. On the 26th December, thirteen days after the acid had been applied, menstruation reappeared profusely, but with much less pain than previously. The uterus continuing to be retroflected, I introduced one of Greenhalgh's elastic spring pessaries, but it caused much irritation and had to be removed. A little later I re-introduced the pessary. At first it caused some discomfort, but was finally borne without inconvenience, and the patient returned home.

On the 27th April, this lady's husband, a surgeon in extensive practice, gives the following report of his wife's condition. "I am happy to tell you Mrs. ——'s health is greatly improved : menstruation is now quite regular, and pain much less. No tenderness over womb or ovaries. No mammary pains. She is not conscious of wearing the pessary. She can now walk, sit, and look after her household. One thing I nearly forgot to mention is that she has completely lost the feeling of nausea. Although I have not used the sound, I believe the uterus must be smaller."

CASE V.—The following is in many respects similar to the preceding case. The patient was aged thirty-five years. Her last child was born six years prior to her coming under my observation. From the date of its birth she had never been well. She suffered from distressing bearing-down, from pain in the back and in the *mammæ*. Menstruation was regular as to time but was scanty, the advent of the flow being ushered in by severe pain. On examination the uterus was found to be retroflected, enlarged, and very tender to the touch. The os was patulous and



surrounded by a wide circle of enlarged vascular *papillæ*. The sound penetrated to the depth of  $3\frac{1}{2}$  inches. The diagnosis made was—enlargement of the uterus depending on subinvolution, subsequent retroflexion, and endo-metritis. After some preliminary treatment the nitric acid was applied as in the former case. No pain was subsequently experienced. After the lapse of six weeks menstruation came on perfectly naturally. She was free from pain in the breasts, and from the ovarian pain. The uterus was, however, still retroflected, and a Hodge's pessary had to be worn.

CASE VI.—Mrs. —, aged thirty, the mother of five children, miscarried a year and a half ago; has never been well since; menstruation appearing at irregular intervals, sometimes scanty, frequently coming in rushes; suffers from a distressing bearing-down feeling, from pain in the back, and from pain over the left ovary—this last being very distressing. She also complained of pain in the *mammæ* and of nausea, the nausea being constant except for about the three days immediately following the subsidence of the menstrual flow, her sufferings being augmented by a constant desire to micturate. On examination the uterus, which was very painful to the touch, was found to be enlarged, elongated, and retroflected. The cervix was soft and congested and the os patulous. The case was evidently one of retroflexion depending on subinvolution, with endo-metritis and ovarian irritation. Local depletion was freely practised, and the bromide of potassium exhibited; the fundus being supported by means of a Hodge's pessary. This treatment was persevered in for upwards of two months, but though the severity of the symptoms was mitigated, no permanent improvement took place. I therefore decided on trying the effects of the nitric acid. I dilated the cervix by the introduction of five pieces of the sea tangle, guarded the cervix by means of the intra-uterine speculum, and applied the acid freely. Some pain was experienced, not however of a severe character, and no constitutional disturbance of any kind followed. In a short time this patient returned home. Three months subsequently I again saw her. She was on the whole decidedly



better, being quite free from the distressing nausea and morning sickness from which she had so long suffered, but the pain referred to the position of the left ovary was still severe, and the retroflexion as marked as ever. On making the bimanual examination the outline of the enlarged uterus could be clearly made out; pressure on the fundus greatly aggravated the pain she constantly suffered, proving to my mind that this pain was due mainly if not altogether to the condition of the uterus. The cervix having become much less vascular than formerly, I found it difficult to obtain sufficient blood by puncturing, and accordingly applied leeches. The bleeding, which was rather too copious, gave relief, and the tenderness on pressure being much lessened, I again applied through my intra-uterine canula (Fig. 2), without any previous dilatation, the fuming nitric acid. A good deal of pain followed, but it passed off in about four hours. At the expiration of twenty-four hours, a "piece of skin," to use the patient's own words, was expelled, evidently a portion of the intra-uterine mucous membrane which had been cast off. Hemorrhage in quantity equal to that of a normal menstrual period now set in; on its subsidence the patient expressed herself as feeling easier. This lady has again returned home, and I have since learned that her health continues slowly to improve. The case, like the preceding one, is not entirely satisfactory, but the patient is decidedly and markedly better. She had been under the care of several practitioners, both in England and Ireland, and states that she never previously received any benefit from treatment. I record the case at length as an example of the unsuccessful use of nitric acid, it being the most unsatisfactory case I have met with.

CASE VII.—E. O'Connor, a servant, aged thirty-six, a patient in the Adelaide Hospital, gave birth to her first and only child three years ago. From that time menstruation has been always profuse, lasting for eight days, debilitating her much from the great loss. She complained of severe pain over the pubes. The uterus, which was but little tender to the touch, was much enlarged; depth  $3\frac{1}{2}$  inches. The os was patulous. Diagnosis: menorrhagia depending on



subinvolution. Ten grains of the solid nitrate of silver were introduced (15th August, 1872) into the uterus through Simpson's intra-uterine porte-caustique; but little pain was subsequently experienced. The next menstrual period was somewhat less profuse, but still the loss was excessive. After the lapse of three months, the improvement being but trifling, she was readmitted; the cervix was then dilated, and the nitric acid freely applied through my intra-uterine speculum. Little pain and no unpleasant symptoms followed. This patient now, after the lapse of five months, continues to menstruate normally and without pain.

It is worthy of remark that the introduction of the solid nitrate of silver in this case failed to do good, while marked improvement followed the use of the nitric acid.

I have now to allude to the use of nitric acid in cases of a very different character—namely, when applied with the view of checking or preventing the occurrence of hemorrhage after the removal of intra-uterine tumours, or of exciting healthy action in the mucous membrane lining the cavity of the uterus which has been the seat of polypoid growths. It was in a case of this latter description, where the rapid recurrence of submucous fibroid polypi within the cavity of the uterus necessitated frequent operations for their removal, that Dr. Kidd, on the suggestion of Dr. Ringland, first applied the fuming nitric acid to the interior of the uterus. The result was eminently satisfactory, and in Dublin nearly all obstetric practitioners now mop out the interior of the uterus with the fuming nitric acid after the removal of tumours. I invariably do so, and the results have been so satisfactory that I shall continue the practice. But in one case a result followed which serves to warn me that one precaution is needful. I shall detail the case.

CASE VIII.—In April, 1870, I removed an intra-uterine fibrous polypus from a woman aged forty-five years. A good deal of difficulty was experienced in dilating the cervix, it being very rigid; the patient had never been pregnant. I succeeded however at length in carrying the wire of an écraseur round the pedicle, which was attached to the fundus of the uterus, and in removing a polypus measuring



2 $\frac{1}{4}$  inches in length. The woman was very anemic, having been weakened by long-continued hemorrhage. I therefore dreaded any further loss, and applied the fuming nitric acid freely to the interior of the uterus. The patient made a rapid and perfect recovery. She menstruated once or twice subsequently, then ceased to do so. A few months ago she presented herself in the out-patient department of the Adelaide Hospital, and I took the opportunity of examining the condition of the uterus. To my surprise I could not, on a digital examination, detect the os uteri or pass the sound, and on looking through the speculum, discovered that the os uteri had become obliterated; a depressed cicatrix marked its site. It was evident that the nitric acid acting on the healthy structure of the cervix had excited adhesive inflammation, terminating in obliteration of the os uteri. In the case under consideration, the patient having passed the climacteric period, the accident was of little importance, but in a younger woman it might have produced serious results. I therefore now always take care to guard the cervix from the action of the acid, in the manner alluded to hereafter.

This is the only case in which any unsatisfactory result followed the use of the nitric acid in my practice, but I desire to give it prominence. I believe that such can never occur if the precaution I recommend be adopted.

There is a third class of cases in which the nitric acid is most useful; indeed, I am inclined to think that in the cases I am now alluding to, its action is more decidedly beneficial than in any other. I refer to those forms of imbedded fibrous tumours of the uterus in which hemorrhage being profuse, surgical interference seems called for. We accordingly dilate the uterus, but on introducing the finger, find that the tumour bulges entirely outwards, encroaching little, if at all, on the cavity; consequently removal by means of the *écraseur* is impossible, while the attempt at enucleation, or even the incising of the tumour, separated as it is from the cavity of the uterus by the greater part of the thickness of the uterine wall, would entail a risk of the occurrence of alarming hemorrhage, which few would dare to encounter.



I have met with several such cases. One is alluded to in my Lectures on Diseases Peculiar to Women, 2nd edition, p. 120. This patient went to the country soon after the application of the nitric acid, and I have not been able to learn any particulars of her since. The following is a very interesting and instructive case.

CASE IX.—M. H., aged forty, was admitted into the Adelaide Hospital on the 7th January, 1873. She was married, but had never been pregnant. Six years ago menstruation commenced to be profuse, lasting for a week, and attended with severe pain, referred to the back, and shooting down along the course of the sciatic and pubic nerves. Menstruation became by degrees more and more profuse, the interval between each period shortening, while the pain not only increased in severity, but became incessant. For months prior to admission she never slept except when under the influence of opium. Indeed she habitually took full opiates every night, in the hope of procuring some remission of her sufferings.

On passing the hand over the abdomen, a tumour could be felt above the pubes, which on examination proved to be the uterus greatly enlarged, and bulging out anteriorly. The sound penetrated to the depth of five inches. The diagnosis of fibrous tumour was made, and as the symptoms were urgent, its removal, if possible, was decided on. Seven pieces of sea tangle were accordingly introduced into the uterus. On their removal the finger passed easily through the os internum, but the inner surface of the uterus proved to be quite even, and the tumour did not encroach in the least degree on the cavity. On consultation with Dr. Churchill and Dr. Kidd, who kindly assisted me, it was decided that any attempt at further surgical interference was unwarrantable, but that the nitric acid should be applied freely, experience having proved to us that its application exercised a powerful influence in checking the menorrhagia present in such cases. Accordingly, having introduced the intra-uterine speculum to protect the cervix from the action of the acid, and having wiped out the interior of the uterus with dry cotton, I applied the acid freely to the whole of its inner



surface. The patient was under the influence of chloroform. When she recovered consciousness she stated that she was free from pain. That night her usual opiate was administered, but the next day she expressed herself as enjoying such perfect ease, that I directed it to be discontinued, and she slept well without it, nor was it again needed. I kept this patient in hospital for seven weeks subsequent to the operation. During that period the sacral and lumbar pains which had so rapidly and entirely disappeared did not return, nor did menstruation recur. As this woman resided in a remote country district, I was desirous that she should menstruate before she left the hospital, but as she enjoyed perfect immunity from pain, her general health being also excellent, I could not persuade her to remain longer. I have, however, heard from her since. She has menstruated twice, the flow being moderate in quantity, the perfect immunity from pain continuing. Before she left the hospital I measured the uterus carefully. Its depth was three-quarters of an inch less than before the application of the acid. The tumour occupied the same position as before, projecting forward, its outline being easily traced by means of the bi-manual method of examination.

CASE X.—A case almost identical in character with the preceding occurred last year in the practice of my friend Dr. Kidd, through whose kindness I had an opportunity of seeing the patient, and of assisting at the operation. A lady, aged fifty-one, had for some years suffered from profuse and debilitating menorrhagia; she also suffered from severe pain, referred chiefly to the left ovarian region. This, at the recurrence of each menstrual period, became actually agonizing. Dr. Kidd diagnosed a fibrous tumour, situated in the anterior wall of the uterus. On dilating the cervix, he found it to be interstitial, and in no way encroaching on or projecting into the uterine cavity. He therefore decided on trusting to the effects of the free application of the fuming nitric acid. In this case menstruation did not recur for eight weeks. The flow then was profuse, though much less so than formerly. Some pain, too, was experienced. Since that period (September, 1872)



this lady's condition has steadily improved. She menstruates regularly, the quantity of blood lost being moderate, and she is free from pain. To use her own words, she "has not experienced such health and comfort for years." (April 25th, 1873.)

The foregoing cases are fair examples of the numerous ones I have treated by the application of the fuming nitric acid. I have been careful to give some in which the least satisfactory results have followed, and have not suppressed or glossed over any unfavourable feature which occurred in any case.

As the result of my experience in the use of the fuming nitric acid, I draw the following conclusions :—

1st. That where tenderness or pressure exists, it should, before the acid is applied, be removed, or at least materially lessened, by local depletion.

2nd. That when this precaution has been taken, nitric acid (fuming) may be applied with safety to the interior of the uterus.

3rd. That when the cervix has been previously freely dilated, its application does not cause any pain. (Cases II., III., IV.)

4th. That in some instances it appears to have a directly soothing influence on the uterine nerves. (Case II.)

5th. That when applied through a canula pain is sometimes produced, but less severe in character than that caused by the use of the solid nitrate of silver. (Case VI.)

6th. That its use is in some cases followed by hemorrhage of moderate amount, which, however, does not influence the result of the case. (Cases IV., VI.)

7th. That if applied to the *healthy* cervix, it may produce contraction and possibly obliteration of the cervical canal, and that consequently means should be adopted to guard the cervical canal, when *healthy*, from its action. (Case VIII.)

8th. That in cases where imbedded fibrous tumours exist, the fuming nitric acid exercises a marked effect in controlling hemorrhage and in allaying pain. (Cases IX., X.)

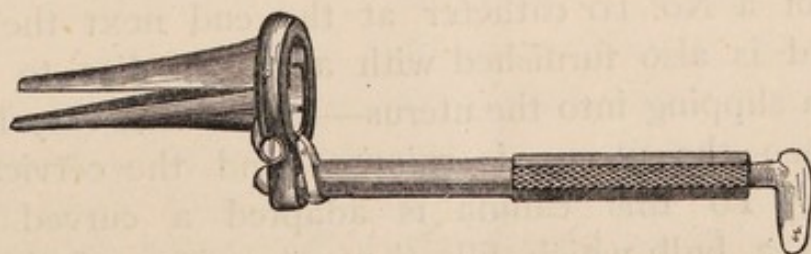
I shall in conclusion add briefly a few directions as to the methods of applying the acid which, indeed, in my opinion,



will hold good with respect to all agents applied to the interior of the uterus.

I am decidedly of opinion that in all cases the cervical canal should be, if possible, protected, and this no matter whether the cervix have been previously dilated or not ; for not only, if this precaution be omitted, will the lower segment of the cervix be most freely cauterized—a part which in the class of cases under consideration is frequently perfectly healthy—but also much of the caustic will be pressed out by contact with the cervical walls and what remains weakened by admixture with the cervical discharge. Consequently its action on the interior of the cavity of the uterus will be greatly lessened. In the majority of cases in which I have hitherto deemed it necessary to have recourse to the intra-uterine application of nitric acid, I have in the first instance dilated the cervical canal so fully as to permit a digital examination of the interior of the uterus, because the patients had suffered from repeated attacks of uterine hemorrhage, the cervix being healthy while the body was enlarged, and therefore I could not with certainty pronounce that the bleeding did not proceed from the presence of a polypus or fibrous tumours. When therefore it is decided that nitric acid be applied, after previous dilatation of the cervical canal, my practice is to seize the anterior lip with a vulsellum, and thus draw down and steady the uterus ; then to introduce the blades of my intra-uterine speculum\* to the depth of about an inch, and

FIG. 1.



to expand them slowly to an extent sufficient to permit a pair of fine forceps, holding a roll of cotton, to be introduced. With the cotton I dry the inner surface of the

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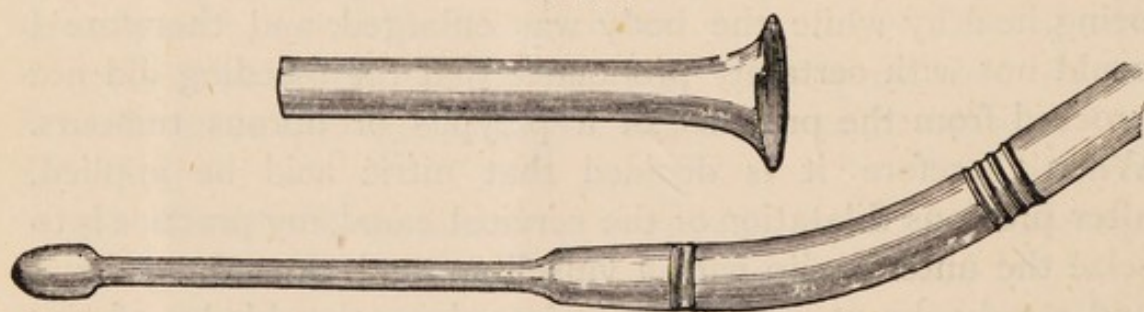
\* This little instrument is made of vulcanite, and is something like an aural speculum expanded by means of a screw worked through a long handle. It was made for me by Messrs. Arnold and Sons, of West Smithfield, London.



uterus, and withdrawing the cotton pass through the speculum a probe armed with a roll of cotton saturated with the fuming nitric acid. I usually have two probes thus armed, and, as a rule, use both, so as to insure the thorough cauterization of the interior of the uterus. The blades of the speculum are now closed. A pledget of cotton soaked in oil, or better in glycerine, is placed in the vagina, a strong thread being attached to facilitate removal, the lip freed from the grasp of the vulsellum, and the patient put to bed and kept quiet for some days.

But cases occur in which the previous dilatation of the cervix is not necessary. To attempt to treat these by the "passing up to the fundus of the uterus a probe wrapped in a thin film of cotton saturated with acid" seems to me useless; for the cervical canal will be thoroughly cauterized, while little if any of the acid will reach the fundus. I therefore have devised an instrument to suit such cases.\* It

FIG. 2.



consists of a canula of platinum two inches in length, of the size of a No. 8 catheter at the distal extremity, but enlarged to that of a No. 10 catheter at the end next the handle, which end is also furnished with a narrow disc to prevent the canula slipping into the uterus—an accident very liable to occur when the uterus is enlarged and the cervical canal patulous. To this canula is adapted a curved stilette ending in a bulb which fills the extremities of the canula accurately; the stilette is fitted to a boxwood handle eight inches in length. The canula fixed on the stilette may be passed into the uterus, just as a sound ordinarily is, and the index finger of the left hand being kept in contact with the

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\* Can be obtained from Fannin and Co., 41, Grafton Street, Dublin.



disc, so as to prevent its slipping out of the cervical canal, the stilette is withdrawn. A Ferguson's speculum is then introduced, and a long uterine probe with a little cotton rolled round it, dipped into the agent selected, is passed through the canula into the uterus. The probe and canula can be withdrawn together. In many cases the speculum can be introduced first, and the canula inserted through it.

The introduction of the canula is generally a matter of no great difficulty, for in suitable cases the cervical canal is generally patulous. This simple method enables you to carry your caustic to any portion of the interior of the uterus you may decide on treating without its being weakened by coming into contact with any other part, and at the same time to protect from its action any portion of the cervical canal you may deem it wise to avoid.

I have derived the most satisfactory results from this method of treatment, and have succeeded in effecting a cure by means of it in cases in which I had failed to do any good by applications made in the old way.

I have never dilated the cervix with the view of applying nitric acid more than twice in the same patient, but when the canula is used it may with safety be reapplied if necessary after the occurrence of the next menstrual period.

I have now given the result of my experience in the use of nitric acid as applied to the interior of the uterus, and in doing so have adhered rigidly to facts. I am not blindly wedded to the use of this one agent. On the contrary, I am at the present time giving a full and fair trial to the carbolic acid, as suggested by Dr. Playfair, and to other agents. As yet, I have obtained more satisfactory results from the use of nitric acid than from any other caustic, but I am satisfied that it is not suitable to all cases, and trust we shall yet be able to define clearly those cases to which the various agents are most suitable. In concluding this paper, I should add that I almost invariably employ nitric acid in the treatment of granular ulceration of the cervix uteri and cervical canal with the best result. Space does not permit however to enter into details on the present occasion.



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