

HISTORICAL REVIEW OF UTERINE INJECTIONS.*

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(Introductory to an original article on Uterine Catarrh.)

IN the treatment of chronic metritis and the catarrh complicating it, intra-uterine injections are by no means such a novelty as is generally supposed, or as we would think from the claims to priority in their use set

* From Beiträge zur Therapie der Chronischen Metritis; von Dr. J. Cohn-
tein, Berlin, 1868.

forth by French writers at the beginning of the third decennium of this century (Méliér, *Metroclysmata*, 1832). The following remark of Lisfranc's (*Clinique de la Pitié*, vol. 3, p. 639): "Pendant longtemps les chirurgiens ont craint de porter ces injections dans l'utérus lorsqu'il participait au catarrhe. Hippocrate en avait cependant donné le conseil, et Viguerie sur la fin du siècle dernier a renouvelé cette pratique," caused me to review the literature of the subject more closely.

Hippocrates knew of uterine injections (*κλυσμοὶ καὶ σαρκτικοὶ μητρείων*), and repeatedly speaks of them, as is evident from Cordæus' commentary on Hippocrates (pages 467 and 470), and they were originally employed to wash out remnants of placenta from the uterus, being in consequence called "*ἐκλώματα*;" on page 408 mention is made of their being used to relieve suppression of the menses, "*ὅπως αἷμαι καταρῥαγή πουλὺν*;" on page 420 he again mentions their use for invigorating the uterus in catarrh, "*οἶνω μελανί*," as well as for chronic ulceration, "*κλίσματα πρὸς τὰ παλαιὰ ἔλκεα*," after other remedies had proved ineffectual. The passage "*ὁμοίως ἔγχυτον κυητήριον*," page 43, seems to indicate that the injections were made ex lacte muliebri, in order to render the woman apt ad concipiendi consuetudinem. In regard to the passage on page 311, "*ταῦτίω κλίσσαι ἀπὸ τῶν ὀλμίδων ἀφ' ὧν ἰδὼρ ἅπαν καθαίρεται καὶ δις καὶ τρις*" the commentary says, "pertinent ad curationem præcepta, quæ quam plurima consequuntur. Primi ordinis erunt collutiones per metranchytam, æque duplicis generis. Parabuntur enim priores ex decocto ficuum immaturarum; posteriores conficiunt

στρυφνὰ, ea quæ paulo adstringunt magis. Quæ utraque si minus satisfecerint, ad secundum remediorum ordinem tum transitio fiat. Ea autem sunt pessaria." When using injections which are to be applied warm the female should assume the recumbent position, "κλιθεῖτω δὲ πλαγίῳ," p. 430; the amount of fluid which should be injected is distinctly mentioned in the following manner, "κλείσαι δὲ δι' οὐ κοτὶλῃσι το πλείστον, παντα δὲ τα κλυσματα μὴ πλέω τούτων κλίζειν."

Nicolaus Roccheus (*De Morbis Mulierum curandis* liber. Paris, 1842, chap. iv., p. 154), speaking of "nimia muliebris expurgatio," and referring to Paulus Æginetus, says: "Jam vero et per metrenchyten instrumentum ad eam rem factum locellis succum plantaginis aut sereos aut seminalis aut strychni . . . infundito, atque hæc eadem per lanam aut digitum, aut malam organum, calammumque in longitudinem formatum, usque ad os uteri indantur inseranturque. Et Andronis denique pastillus cum metrenchyte infusus cum prædictorum succo aliquo, aut vino adstringente, efficax et præsentaneum est remedium;" also in chapter v., "de uteri suffocatione," pp. 159, 168, 172. (The Arabians used the term "Argalia.") In chapter xii., "de exulcerationibus locellorum," p. 176, injections are recommended, "quæ ulcus mundant et abstergunt, deinde exsiccantia et demum quæ carnem deperditam recuperant deterguntque ulcera." In almost every subsequent chapter injections are mentioned, according to Eucharius and Avicenna, without, however, giving any new views.

Jacobus Sylvius (*De Mensibus Mulierum*, p. 154) says, "In uterum autem injiciantur, quæ humores putre-

dine, vel mistabile acres, aut etiam frigiditate insigni unitatem divellentes mulceant, tergeant, abluant, ut lac quodvis etiam amylo in cocto incrassatum additis primum, quæ parum adstringant;" further, p. 329, "in uterum metrenchyta immitte decoctum calaminthes . . . si autem virgo est, sedi aut potius collo vesicæ."

In the work of Bapt. Montanus (*De Uterinis Affectibus*, p. 221, Vol. II. of the *Gynæcia*) we find the following very characteristic passage: "Præterea uterus est sentina omnium excrementorum in corpore existentium: nam omnia decrementa defluunt ad uterum, id quod etiam impedit curam: est et aliud incommodum, quod mulieres propter pudorem nolunt fateri veritatem: tametsi coactæ sunt plerumque dicere veritatem, nolunt tamen facere quod jubent medici, neque volunt in ea parte admittere medicamenta. Hoc mihi semel accidit, cum curarem mulierem quandam nobilem menstruis albis laborantem: volebam uterum mundificare et ipsa rogavit me, quibus eum vellem mundificare: ego dixi cum clysteri in uterum iniecto. Cum autem audivisset me cum clystere velle mundificare uterum, illa adeo excanduit, ita ut tota facies subito mutaretur, et mori potius vellet, quam admittere huius modi medicamentum."

Ambrosius Paræus (*Liber xxiii.*, *Liber de hominis generat.* Frankfort, 1594, chapter lx., *Cura fluoris muliebris*, p. 477) advises as a rule, when using injections, "muliere pulvinari natibus subjecto sic collocata, ut altior uteri cervix dehiscat." In chapter lviii., p. 475, he says, "fiat decoctio, de qua fiat expressio in uterum syringe obtuso mucrone prædita ne acuto allisu cervicis uteri latera lædat."

According to Albertinus Bottoni (*De morbis muliebr.*, chap. xxviii., p. 331, Vol. II. of the *Gynæcia*), injections should vary according to the condition of the uterus, "ut si duritie et callositate aliqua correptus fuerit uterus, ex laxantibus et emollientibus componendæ sint, sive olea ea fuerint, succi aut decocta, pinguedines aut medullæ. Quantitas autem modica esse debet, quia loci angustia majoris copię non est capax." They should also be administered before meals, and used lukewarm, the genitals being lubricated with oil, "ut instrumentum facilem ingressum habens in transitu suo nulum dolorem producat. Si idem uterus obstructione detentus fuerit a materia crassiori et lenta producta, qualis est pituita," these substances should be washed out of the uterus with the various decoctions prescribed. The author, on pages 362 and 375, adds, that the uterus should be cleansed of all "sordes" and invigorated with desiccating injections.

In the work of Rodericus a Castro (*De universa muliebr. morbor. medicina*, Hamburg, 1663, part II.) extensive use of uterine injections is mentioned, and his predilection for this class of remedies at least proves their harmlessness. After recommending injections in chap. iv., p. 23, to relieve suppression of the menses, he continues, on page 43, "injectiones uterinæ fiunt ex iis, quæ adstringunt et ora venarum consolidant ac retundunt acrimoniam humoris, nam ad hos tres scopos medicus collimare debet, ut ex aqua vel succo plantaginis, solani, portulacæ, sanguinarïæ, aut ex decoctione earundem herbarum, rosarum et myrtillorum, aut ex cremore ptisanæ, vel decocto hordei." Further formulæ are given

in the chapters *De strangulatu ex utero*, p. 160; *De epilepsia ex utero*, p. 177; in chap. xi., *De uteri debilitate*, p. 244, stimulating herbs are recommended; in chap. xiii., *De humida uteri temperatura*, p. 250; in chap. xv., *De calida uteri intemperatura*, p. 263; in chap. xix., *De uteri hydropes*, p. 278; in chap. xx., *De uteri inflatione*, p. 282; and in chap. xxi., p. 288, it is advised that the injections should be small in quantity, "*ne compressione dolores concidet.*" In chap. xxiii., p. 298, *de scyrrho uteri*, *injiciatur in uterum si femina tolerare queat.* In chap. xxix., p. 324, *De uteri ulceribus*, it is said, "*Antequam medicamenta applicentur, ulcus abluere necesse est, ac si sanies acris fuerit, sero ulcus abluatur, si copiosa sordes melicrato, si multa et acris, sero cum syrupo ros., vel sacchari octava parte, siccaturum vino; si putridum et malignum, aqua marina.*" But he recommended that injections should only be used when there were ulcers in the fundus uteri; ulcers of the cervix were to be treated with pessaries. If the ulcerations resulting from puerperal conditions were recent, astringent injections should be dispensed with (libr. iv., p. 497), and only such as were *modice siccantes et adglutinantes*, should be used, so as not to interfere with the lochial discharge.

Hieronymus Mercurialis (*De morbis muliebr.*, 1617) did not particularly advise injections. A few passages, however, show that he made use of them, as in Book iv., chap. vi., p. 146 (*De fluore muliebr.*): "*Infunduntur etiam quædam adstringentia in uterum, quæ conveniunt mirifice hunc fluxum sistere.*" On page 150, when speaking of ulcerations of the uterus, he says, "*si vero ulcera*

fuerunt in profundo, eliquatur linimentum cum succo vel myrthi vel plantaginis et mittitur in uterum."

Ludovicus Mercatus (*De mulierum affectionibus*, Venetiis, 1587) treats in detail of uterine injections when speaking of hemorrhages (book I., chap. viii., p. 45), uterine catarrh (chap. xv., p. 109), and ulcerations (chap. xx., p. 297). In regard to hemorrhages, he says, "atque etiamsi pessariis et multis aliis ingeniis medicorum nonnulli hoc vitium corrigere nitantur, ego tamen innitens decretis priscorum in hac re parum pessariis fiderem, modo ab uteri cervice, modo ab utero ipso sanguis profluat: vis enim pessariorum adstringens raro ad aperta vasorum oscula pervenire poterit. Quam ob rem per uterina clysteria . . . corrigere conabor. Immittere primo in uterum per metranchitam (uterinum appellatum clystere) poteris vinum dulce cum cortice maligranati decoctum. . . p. 71. At uterinos clysteres degustare virgines fas non est: cavere enim oportet eas ab huiusmodi præsidio, verum in aliis feminis mille modis parari possunt . . . Cæterum hoc præ oculis habeto in iis, quæ in uterum infunduntur, ne diu ibidem immorentur, auferantur post horas duas aut tres," (this must be understood as follows: that after the injection, a tent should be introduced into the uterus to absorb the fluid). When speaking of uterine catarrh, he says, "Sic quo biliosior fuerit fluxus, eo magis oportet humorem attemperare ac diligenter providere, ne fluat et si fluxerit, ne uterum mordeat exulceretve, ac per consequens magis humores ad se alliciat: aliquando per uterinos clysteres ex mucilaginis ac lenientibus pharmacis confectos id præcavendo." When

speaking of ulcerations of the uterus, he says: "Quod si ulcus squalens siccumque esse ex recrementorum defectu cognoveris, bis die ipsum ablues aqua tepida per metranchitam infusa, cui addes sacchari parum . . . verum si ex copiosa humiditate, quæ per uterum excidat, compereris . . . vinum vel decoctum austersæ alicuius herbæ injicere oportet. . . . Item ad profundiora ulcera ex usu est injicere medicamentum."

John Astruc (*Traité des Maladies des Femmes*, Vol. II., 1765) gives his opinion that astringent injections should be combined with emollient ones, so as not to suppress the secretions from the uterus, or excite inflammation of the organ; narcotics should be added to the injections, so as to modify the effects of the latter. But highly astringent, caustic, or styptic injections should never be used (such as are prepared from the rind or flowers of the pomegranate, and from red roses, especially if alum, lapis medicamentosus of Crollius, Verny's powder, or dragon's-blood be added).

Injections administered with a long-nozzled syringe, the end of which has many perforations, require skill in using, if the tube is to be introduced, without injuring the os, and still greater care is requisite in forcing in the fluid. In the treatment of ulcerations of the uterine cavity, injections are the best remedies; they should be made of a simple decoction of barley, the sulphurous mineral waters of Barèges (mixed with lime-water), or the tincture of myrrh. Otto, a German translator of Astruc's work, mentions in a note that he knows of cases in which the use of the above "beautiful remedies" was followed by attacks of severe

uterine colic. He likewise considers uterine injections as labor lost, the os never being sufficiently open to admit the nozzle of a syringe.

Wenceslaus Trnka de Krzowitz (*Historia Leucorrhœæ*, 1781) says: "Injectiones uterinæ vel elutiones amplioris sunt usus, quarum ope quæcunque a morbi principio ad finem usque indicantur, ipsi affecto loco possunt applicari. Præcipuus autem earum usus est ad acrimoniam profluentis materiæ obtundendam, dolorem ardoremque sopiendum, erosa excoriata ulceratave sananda, pus pravem corrigendum, insecta, siqua adsunt, necanda, amissumque uteri tonum restaurandum ac fluxum pertinacem sistendum. Hinc pro varietate horum adiunctorum variæ perinde iniectiones locum sibi deprecant. In genere vero, inquit F. Hoffmannus, illud notandum arbitror, quod tales iniectiones non simul ac semel et magna quantitate, sed crebrius et in refracta portione, ad unciam scil. 1 vel 2 adhiberi debiant. Vitanda autem sunt omnia salsa, acrida, nimis pingua et lubricantia Si denique ulceratio uteri affuerit, velut diuturnitate morbi haud raro accidit, iniectiones sunt admodum necessariae vulnerariæ cum leniter adstringentibus. Etenim teste R. Mead externe minime adhibere oportet, quæ nimia vi peccantem humorem reprimunt ac repellunt; illa tantum sunt ex usu, quæ membranæ huius ulcuscula detergent simul et sanant. Ipse eventu sæpe felicis simo feminam laborantem, aut aluminosam Bateanam, aut vitriolicam camphorata, adjecto alterutri mellis Ægyptiaci aliquantulo, per syringem huiusmodi usibus aptam parva quantitate ac repetitis vicibus infundere iussit."

Collingwood (Lond. Med. Repository, 1821) used warm injections, repeated every four hours, with good effect, in three cases of infarctus uteri.

C. A. W. Berends (Vorles. über pract. Arzneiwissenschaft. Berlin, 1828, Book III., p. 379) recommended uterine injections in cases of metritis, commencing with a decoction of barley and rose honey, and then substituting an infusion of millefolium, to which myrrh, copaiba balsam, and turpentine were added, if the secretion was dark-colored.

Elias Von Siebold (Handb. zur Erkenntniss, etc. Vien. 1829. Vol. I., p. 334) is of the opinion that injections can rarely be used at other periods than during the puerperal state, as the narrowness or occlusion of the os would not allow of the introduction of the nozzle, and any force in its use might increase the inflammation; but on page 383 he says, that the patients should use the injections themselves with the assistance of a skilled assistant, to make sure the fluid be not lost at the os.

Peter Frank (Behandl. d. Krankh. Berlin, 1830. Theil II., p. 146) rejects the use of injections in cases of metritis, and says they would afford no benefit, and only tend to increase irritation.

Steinburger (Jour. f. Geburtsh. v. Siebold., Bd. VI., 1837, p. 76) used injections of tincture of iodine and solutions of nitrate of silver in lymphatic constitutions.

Whilst thus intra-uterine injections, especially in Germany, were recommended by some authors and rejected by others without special cause, Hourmann, a French surgeon of the Hôpital de Lourcine, attracted the attention of the profession to uterine injections by pub-

lishing a case of leucorrhœa, in which quite a simple injection was followed by severe symptoms of metro-peritonitis (*Bullet. de Thérap.*, tom. XIX., p. 60). The assumption that the injected fluid had found its way in this case into the peritoneal cavity was easily credited, as at the same date the post-mortem examinations of two females under Bretonneau's treatment, in whom the same symptoms had appeared during life after the use of uterine injections, revealed effusion into the peritoneal cavity. Astros also, in Nélaton's wards, found fluid not in the peritoneum, but in a vein of the broad ligament of a female who died of facial erysipelas after such injection.

Induced by these contradictory post-mortem reports, Vidal de Cassis (*Essai sur un traitement méthodique de quelques maladies de la matrice par les injections intravaginales et intrautérines*, Paris, 1840) undertook experiments on dead bodies with the following results:

If, with a syringe, used for injecting arteries, the neck of the uterus being fastened to the nozzle, forcible injections were made, the fluid permeated the uterine blood-vessels (which were also inflated with air) and passed into the oviducts; copious injections (40 gramm.) made with a urethral syringe of twice the capacity of the former one, the force used being that ordinarily employed for injections into the ear, forced the fluid twice through the oviducts; in six cases the canal of the latter seemed to be impermeable; in one case the fluid did not pass through the tubes, but entered the uterine blood-vessels; in another of the cases ulceration of inner surface of the uterus was found, by which the cavity communi-

cated with the disturbed vein. If moderate quantities (20 grammes) were injected, the fluid reached neither the peritoneal cavity nor the oviducts, but always returned into the vagina between the cervix and canula.

Still more convincing than the experiments on the dead body were a series of clinical observations, proving a certain opposition on the part of the oviducts to the passage of fluid, and thus refuting the danger of uterine injections. In these experiments Vidal introduced a thin straight canula which was smaller than the diameter of the os, and at the upper end of which was a ball perforated at numerous points, and injected into the uterus, with a urethral syringe, iodide of potassium 5 centgrm., iodine 2 centgrm. 5 mill., water 30 grm. 59 cent. The force employed was not greater than that usually applied to the meatus auditorius; the syringe contained no air. From two to three days before the appearance of the menses the injections were discontinued, and resumed three days after their cessation. After delivery a sixth months' interval was allowed before the injections were resumed.

Vidal divides the phenomena following the injections into the primary, mediate, and consecutive; the two first were absent in nine-tenths of the cases, and where they appeared they were colics of short duration and nervous in character, similar to headache following injections into the Eustachian tube. No consecutive symptoms were noticed beyond the beneficial influence of the injections.

In his second treatise Vidal prefers caustic injections of nitrate of silver to those containing iodine (*Annal. de*

la Chirurg., 1841), and he recommends, before their use, that the cavity of the uterus be washed with lukewarm water, and that no more than about nine drachms of fluid be injected with one impulse of the syringe.

Duparcque at the same time practised injections of water with a hydrocele syringe (*Gaz. Med.*, 1840, No. 19), and which were followed by severe pains in the abdomen and the region of the kidneys whenever the injections were made with a certain amount of force. The uterine cavity being generally filled with viscid mucus, the fluid was forced in by powerful but short impulses, at sufficient intervals to prevent the accumulation of fluid in the uterus.

He made the majority of his injections into the cervical canal, which in his opinion was the location of uterine affections, and for this purpose employed a canula imperforate at its extremity, but having lateral openings.

In Germany, experimental injections on the dead body were resumed in 1862 by C. Hennig (*Catarrh of the Internal Female Genitals*, Leipzig, 1862, p. 12). These experiments gave the following results: That under a gradually increased pressure from injections made with a common uterine syringe, the canula being hermetically ligated to the cervix uteri, not a drop of the injected fluid penetrated either of the oviducts, the uterine orifices of the latter only being filled to about three millimetres. Klemm (*The Dangers of Uterine Injections*, Leipzig, 1863) found that the injected fluid, whenever the os was not ligated, always returned through it, and never penetrated the oviducts, whether they were injected from a column of water five feet high or by means

of a small syringe. Whenever the fluid penetrated the oviducts after ligation of the os, the fluid advanced slowly, an observation which is contrary to the assertion that the pains immediately follow the injections. In three cases out of eighteen, blue ink, injected through a narrow os with moderate force, penetrated the venous system of the uterus and broad ligaments without apparent laceration. To the latter circumstance is attributed the sudden appearance of metritis and peritonitis after injections.

Notwithstanding these repeated experiments, until this day the fear of the penetration of injected fluid through the oviducts into the peritoneal cavity has not been overcome. The importance of Hourman's case was to cause this fear, which, being shared in by many authors, gave rise to manifold precautionary measures; whilst others from these experiments only searched for new modes of explanation of the unpleasant symptoms following uterine injections.

Hutin (*Examen pratique des maladies de la matrice*, Paris, 1840, p. 212) considers the phenomena following injections as partly belonging to general hysteria, and partly dependent upon incomplete reflux of the fluid from the uterus. The latter occurrence he proposed to avoid by applying the canula, during the injection, closely to the anterior lip, thus leaving a larger space between the canula and the posterior lip. If exit is thus given to the fluid, it will not take the more difficult course through the oviducts, especially in living subjects, in whom they are more turgescient than in the dead body.

In Guy's Hospital Reports (No. IV., 1837) a case of profuse catarrh of the uterus is mentioned, for the cure of which, after the fruitless use of all other remedies, injections of warm water were ordered. Severe pains followed the first, and after the second injection hysterical attacks, with the abatement of which the secretion disappeared.

Leroi d'Etiolles (*Frorieps Notiz.*, Bd. 17, p. 192, 1841), after two injections of thirty grammes of decoction of marshmallow, witnessed paroxysms which he attributed to inflammation of the oviducts and ovary.

Guillemain (*Fricke und Oppenheims Zeitschr.*, Bd. 16, p. 254) in six cases employed injections of gum-water with good success, and observed only once, in an hysterical female who had been delivered nine months previously, an uneasiness of short duration, and the occurrence of menstruation eight days before time. Injections of the sulphate of zinc were then used, and were followed by pain, rigors, heat, and labor-like pains and hæmorrhage, lasting five days.

Velpeau (*Gaz. des Hôpit.*, 1842, pp. 1, 2), having ascertained that fluid will not pass into the peritoneal cavity, speaks in favor of the uterine injections as recommended by Vidal, consisting of concentrated solutions of nitrate of silver, applied twice a week, for profuse catarrh of the uterus.

Landsberg (*Neue Zeitschr. f. Gbkd.*, Bd. XII., 1842, p. 204) mentions the occurrence of a slight metro-peritonitis after an injection which was not made directly into the uterus, but by the patient herself, into the vagina. Reviewing this case, Betschler uses the argu-

ment that in this case a profuse secretion was checked by the injection, and the existing congestion transferred by metastasis to the peritoneum. Without discussing this explanation we will remark, that injections which are only intended for the vagina may, under certain circumstances, extend to the uterine cavity, either when the os is open, or there is retroversio or descensus uteri.

Osiander (*Neue Zeitschr. f. Gbkd.*, Bd. 17, 1845, p. 158), in regard to the question whether uterine injections are dangerous or not, answers, that stimulating injections of wine, vinegar, solution of alum, or ice-water should not be used in obstinate hæmorrhages of recently delivered females, unless from extreme necessity, as enteritis might follow. Outside of the puerperal period he found injections in two cases to be harmless, and quite efficacious. Injurious consequences of injections he attributes to the extreme sensitiveness of the uterine mucous membrane.

Cattel (*Lancet*, Dec., 1845) recommends the following formulæ for intra-uterine injections: (1) *Solutio caustica saccharata* (oleum, 3 j.; potassa or soda, 3 ss.; sacchar. alb., 3 ij.; aq., lbs. ij.); (2) *Solutio saponiformis* (oleum, 3 ii.; sol. caust., 3 j.; aq., q. s.). Similar combinations for leucorrhœa, containing copaiba balsam, cubeb-water, turpentine, oil of ergot, and creasote were also prescribed.

Ricord (*Gaz. des Hôpit.*, 1846, p. 106) used caustic fluids as injections; but as they ought to remain but a short time within the uterus, he had a syringe made by Charrière, consisting of a double tube with independent pistons. One tube contained the caustic fluid, the other

simple water, for ablution. Instead of the caustic fluids a weak solution of iodine was sometimes used (from two to three parts of iodine to 100 parts of water).

Kiwisch (*Oestr. Méd. Jahrb.*, Sept., 1846), although convinced of the efficacy of injections in hæmorrhages, thought that in metritis neither injections of iodine or the nitrate of silver equalled in efficacy the uterine douche.

Filhos (*Revue Med.*, 1847) asserts that the fact of injections passing into the peritoneal cavity is unfounded, and uses cold injections.

Récamier (*Journ. de Chirurg.*, Mai, 1843) found injections of nitrate of silver useful, provided that ablutions of water were used after them, to moderate the irritation and pain.

Evory Kennedy (*Dub. Quart. Jour. Med. Sciences*, No. 5, Feb., 1847) from cautiousness recommended the following procedure:—A graduated glass syringe, containing from twenty drops to half a drachm, attached to an elastic catheter, which is also graduated, is introduced into the uterus by means of a shorter and broader elastic tube. The injection is made slowly, and after the fluid has remained as long as desired it is again withdrawn by means of the syringe; water is then injected, and the wide tube is left in situ for some time, to facilitate the efflux of whatever fluid may have been retained. Of caustic injections preference is given to the nitrate of mercury.

Oldham (*Lond. Med. Gazette*, Feb., 1847, p. 380) had unfavorable results in two cases, in one

of which the fluid had only been injected into the vagina. He disparages injections as liable to be followed by peritonitis, and ultimately the formation of false membranes in and around the uterus and its appendages.

Pichard (*Traitement des Ulcérations du Col*, Paris, 1847), in addition to injections according to Vidal, recommended irrigation of the cervix by means of a "utero-therme" constructed for the purpose.

According to Strohl (*Gaz. de Strasb.*, Oct., 1848), the uterus bears injections very well; peritonitis may be avoided by providing for the efflux of the fluid through the os, and uterine colic by a proper temperature of the fluid. The passage of the fluid through the internal orifice being generally impeded, many injections, he thinks, do not reach the uterine cavity. In order to avoid irritation and mechanical lesions, he generally employs pure lukewarm water; in obstinate cases, the iodide of iron, sulphate of zinc, and nitrate of silver. The secretion is diminished, becomes whiter and thinner, and, after eight days of application, quite transparent.

Bessemers (*Annal. de la Société de Méd. d'Anvers*, 1849) relates a case of sudden death after an injection of chlorine water. The post-mortem revealed air-bubbles in the vena cava and the right ventricle of the heart.

Debenney (*L'Union Méd.*, Sept. 20, 1849) recognizes caustic injections repeated every three days as the most harmless and best remedy against leucorrhœa.

Gubiau (*Gaz. des Hôpit.*, 1849, p. 39) is of the opinion that injections are harmless in some cases and

dangerous in others, from a peculiar predisposition, such as a previous miscarriage, labor, menstruation, or moral affections. A female in whom injections had repeatedly been made without injury, died of peritonitis, following an injection after excessive grief.

Rayer (*Zeitschr. d. Gesellsch. d. Aerzte in Wien*, 5 Jahrg., März, 774) observed the occurrence of severe pains in three cases after injections of solutions of nitrate of silver in solution of opium, but leaves undetermined as to how these pains were occasioned.

Pédelaborde (*L'Union Méd.*, p. 65, 1850) relates a case in which, three minutes after an injection of the decoction of walnut-leaves, severe uterine pains ensued, and in a few hours were followed by acute peritonitis.

Chiari (*Zeitschr. d. Gesellsch. d. Aerzte in Wien*, 7 Jahrg., 1851, 21 März), fearing the passage of fluid into the oviducts, used injecting tubes closed at their extremity, in order to turn the current laterally, and had excellent success with the use of diluted tinct. of iodine, where his usual remedy, cauterization with the nitrate of silver, had failed.

Retzius (*Neue Zeitschr. f. Gbkd.*, Bd. 31, 1851, p. 391) relates a case of peritonitis following an injection, which is referred to by West, who states that he has no personal experience regarding injections. Retzius injected into a uterus of twelve to fourteen lines in length, an ounce of a solution of nitrate of silver, which, although but half was injected at a time, proved inadequate to the capacity of the organ.

Lange (*Deutsche Klinik*, 1852, No. 48, p. 548) discontinued the use of injections because he found them

non-efficacious, and prefers the solid nitrate of silver, or painting with a solution of iodine, as advised by Churchill. Homolle and Maisonneuve assert that caustic injections are less dangerous than mild ones, as caustics coagulate the uterine mucus, and thereby occlude the orifices of the oviducts.

Ashwell (Guy's Hospital Reports, 1835, Vol. II., p. 219) was of the opinion that injections which may cause chronic leucorrhœa to become acute, and consequently may excite inflammation of the uterus and the peritoneum, should be used only in severe cases, in which the secretion threatens to produce serious constitutional effects, as degeneration of the uterus and ovaries, and sterility. In one of his cases (page 225) metritis followed the use of an injection of a weak solution of zinc, but was ultimately relieved; in two other cases, after an injection of soot and water, slight pains occurred, and the catarrh was entirely cured. Two circumstances, he thinks, must be considered before deciding the propriety of using injections: First, that after a leucorrhœa has existed for some time, it should not be relieved too suddenly, for fear of evil consequences to the system, which has become accustomed to the disease. Secondly, in old, debilitated, and scrofulous women, the suppression of such secretions cannot well be undertaken without first improving the general condition.

Routh (Obstetrical Trans., Vol. II., page 177) applies injections in the following manner:—The os having been dilated with a sponge tent sufficiently to allow the introduction of the index finger into the cer-

vical canal, the entire mucous membrane is abraded by means of a scraper or gouge, and a half ounce of compound tincture of iodine, or solution of ferri sesquichlori is injected through a rubber catheter, and allowed to flow back through the speculum. These injections are to be repeated as long as the uterine canal is open enough to admit a goose-quill. Routh states that these injections not only have an astringent effect, but also restore a healthy action to the diseased mucous membrane.

Sigmund (*Wien. Med. Wochenschr.*, VII., 40, 42, 1857) precedes the application of caustics by the dilatation of the cervix with sponge-tents and cleansing injections of water, by means of a syringe capable of holding a pound of fluid. The caustic is applied either solid or liquid. The latter consist of solutions of half drachm of nitrate of silver, one drachm of sulphate of copper, one drachm of iodide potassium with nine grains of iodine, two drachms of the chloride of zinc, three drachms of the perchloride of iron : either of these to three ounces of water, which is injected by means of a glass syringe containing an ounce and a half. After the fluid has been injected the canula is left a few minutes in the cavity of the uterus, to favor the return of all the fluid injected.

Becquerel (*Bull. de Thérap.*, Avril, 1860) publishes the results of six cases of uterine catarrh treated with injections. In one case only the catarrh was diminished; of the remaining five, three only could be saved by energetic antiphlogistic treatment, the effects of the injections being exceedingly severe.

Mathew Duncan (*Edinburgh Med. Journal*, Vol. V.,

p. 826, 1860) found uterine injections made with cold water very useful in the chronic leucorrhœa of aged women.

Tilt (*Lancet*, Feb., 1861) has frequently observed bad consequences follow injections of the nitrate of silver, and therefore gives preference to the tincture of iodine as recommended by Arran.

Noeggerath (*Schmidt's Jahrb.* 1861. 112. Bd. p. 361) relates four cases in which he used injections; the first was a case of metrorrhagia, in which the tincture of iodine was employed with good success. In the second case (uterine hæmorrhage of twenty-three years' standing) a cure was ultimately effected by liquor ferri sesquichlor., although serious and protracted symptoms followed. In the third case an injection of a solution of the nitrate of silver was followed by metro-peritonitis, and the same injection in the fourth case was followed by death. Although Noeggerath advises against the use of remedies which jeopardize the life of the patient, still, he is far from objecting to the use of all injections. He reckons among the harmless and yet efficacious injections, tinct. of iodine, tannin, and benzoin, and among those which occasion severe reaction, solutions of the nitrates of silver, mercury, and concentrated mineral acids. As the effect of the injections greatly depends upon the sensibility of the organ, he advises to previously diminish the sensibility of the uterus by injections of water, which may be followed by a series of solutions. By gradually augmenting their power, we diminish the irritability of the uterus, and gradually prepare it for the toleration of the stronger solutions required.

Haartman (Petersb. Med. Zeitschr., 1862, Bd. II., p. 130) expresses the opinion that injections cause attacks of pain either from the lowness of their temperature, or from being used in too large quantity, but never by their irritating quality, as powerful remedies may be introduced in substance into the uterine cavity without producing severe symptoms. Although Hennig, as stated previously, denounces the dread of the passage of injected fluid into the peritoneal cavity, yet he feared injections might easily produce uterine colic, which might in turn be followed by circumscribed peritonitis. He therefore advises that the injections be used only at intervals of fourteen to twenty-eight days, first using lukewarm water or pure glycerine, afterwards solutions of iodine and iodide of potassium, gradually increased in strength, and finally pure tincture of iodine or solutions of the nitrate of silver, gradually increased in strength, the injections to be made through a double canula.

C. Braun (Monatsschr. f. Gbkd., XXVI., 1865, 1) uses a syringe designed after Pravaz. It consists of a curved tube of hard rubber, two and a half to three inches long, provided at its end with a screw, and a lateral opening at its extremity, and also of a glass cylinder capable of holding twelve drops of fluid, and a rubber tube with graduated piston. This instrument, which owes its origin to the fear of larger quantities of injected fluid passing into the oviducts, requires repeated filling, whilst the lateral escape of the fluid, drop by drop, prevents a uniform effect upon the mucous membrane.

Fürst (Wien. Med. Wochenschr., 1865, 24) recommends injections composed of a solution of one drachm of nitrate of silver in two of water, to be introduced with the above syringe. According to this author, uterine reaction depends upon the power used in injecting the fluid.

C. Mayer (Virchow's Archiv., 10 Bd., 1856, p. 127; Monatsschr. f. Gbkd., Bd. XV., 1860, p. 96; *ibid.*, Bd. XXVI., 1865, p. 3) dissuades from the use of injections in several papers. This advice may be owing to a case in which the injection of a small quantity of a weak solution of the nitrate of silver, which could not possibly have reached the oviducts, instantly induced the most serious nervous attacks—uterine colic, with fainting spells, and frigidity of the extremities, notwithstanding it was carefully injected.

Martin (Berl. klin. Wochenschr., 1865, No. 16) has noticed injections to be followed by transient colics, and has seen evident benefit from lukewarm injections composed of five grains of the aluminate or the sulphate of copper to six ounces of distilled water, when injected in small quantities, in cases of catarrh of the uterine cavity and protracted metrorrhagia. During pregnancy, and immediately after delivery, he thinks injections are dangerous, and only advisable in exceptional cases after the failure of other remedies.

Grünewaldt (Petersb. Med. Zeitschr., 1865, p. 195) mentions the case of a female in whom uterine catarrh and extensive erosions of the lips of the os uteri had baffled every treatment, but which promptly yielded under the use of an injection of two drachms of recti-

fied pyroligneous acid into the cavity of the uterus, without any cauterization of the erosions being necessary. For the purpose of ablutions, and for liquifying the uterine mucus, injections of a weak solution of soda, followed by that of an astringent fluid, are also recommended. The usual train of symptoms—fainting spells, nausea, and uterine colics—also occurred in this case, and were attributed by Grūnewaldt to the hindered reflux of the injected fluid and the mechanical distention of the uterine walls.

Snow Beck (*Med. Central-Ztg.*, XXXV., p. 55, 1866) attaches the greatest importance in the treatment of chronic metritis, to carefully made astringent injections into the uterine cavity, which, provided the os uteri is sufficiently open, promptly restore susceptibility to impregnation.

Th. D. Mitchell (*Dublin Press*, Nov. and Dec., 1847), knew that by the renewal of conception, metritis could be cured, and that, therefore, the removal of the previous hindering circumstances was necessary, and which he thought to accomplish by injections of nitrate of silver, acetate of lead, or carbonate of potash in weak solutions, in order to neutralize the acid reaction which the uterine mucus gives in certain morbid conditions, and which, according to Donn , has a destructive effect upon the spermatozoa.

Murray (*Lancet*, Vol. II., No. 1, 1866) injects tincture of iodine by means of an elastic catheter with numerous eyes, after first removing the uterine mucus with a slender brush similar to a bottle-washer. Upon these injections the uterus always reacts by energetic con-

tractions, the catheter frequently being expelled, and its reintroduction being very difficult.

Marion Sims (Uterine Surgery) states, that injections of glycerine, tincture of iodine, and persulphate of iron into the uterine cavity, can be applied with perfect safety, provided the return of the fluid is rendered possible by a sufficient dilatation of the cervix; if this precaution is not taken, alarming attacks of uterine colics, and painful and prostrating symptoms result.

According to Veit (Virchow's Pathology, Vol. VI., p. 279), it is sufficient for practical purposes to note the fact that the danger of intra-uterine injections can be averted by precautionary measures. If the reflux of the injected fluid is uninterrupted, from one to one and a half ounces of fluid may be injected successively. Veit has sometimes used, without ill effect, three and four times this quantity in one treatment, and diminishes the intensity of the uterine colics by warming the fluid to about 90°.

Scanzoni (Lehrb. d. Krankheiten d. Sexualorgane, 4. Aufl., 1. Bd., 1867, p. 49), rejecting the theory of the passage of fluids into the oviducts, raises the question, whether peritonitis following injections should not be considered as the consequence of acute endometritis, occasioned by the injection and spreading by continuity. He also remarks that not every pain following injections should be considered as the result of inflammation, but in most cases in consequence of a morbid contraction of the uterine walls.

Courty (Maladies de l'Uterus. Paris, 1866, p. 262) gives his opinion as follows:—

“Rien ne serait plus simple et plus efficace que ces

injections, si la susceptibilité de la muqueuse, si l'étroitesse de l'orifice cervico-utérin, si la perméabilité des trompes qu'on a eu le grand tort de nier, n'étaient l'origine de dangers d'autant plus grands qu'ils sont quelquefois plus imprévus et que la prudence la plus éclairée ne les a pas toujours fait éviter. Pour mon compte, j'ai pu faire souvent ces injections impunément; mais, bien que je n'aie eu à déplorer la mort d'aucune de mes malades, j'ai vu naître instantanément à la suite de ces injections des accidents si formidables, que je me suis bien promis de n'y revenir jamais avec des liquides caustiques, et de ne les pratiquer avec de l'eau pure que dans les circonstances de liberté avérée de l'orifice cervico-utérin, permettant au liquide de refluer par cet orifice dans le vagin, dès qu'il a rempli la cavité utérine."

In the Academy of Medicine in Paris, intra-uterine injections were repeatedly the theme of discussion. When at the last meeting of Feb. 11th (*Archive génér. de Méd.*, Mars, 1868), M. Gosselin arose to speak against these injections, in order that it might not appear that the communications which had been submitted to the Academy, in favor of injections, had received even its tacit approbation, MM. Ricord and Depaul sustained his remarks. M. Hugier alone reserved his opinion, and promised at an early date to submit to the Academy a sound which would answer all requirements. If we inquire into the reasons of this sweeping criticism, we find it is not supported by new clinical observations or experiments, but is owing to an opposition previously determined on and founded upon some unfavorable case transmitted by tradition, which if impartially consid-

ered, might possibly have received quite a different explanation, but would certainly never have led to an adverse conclusion on the practice in general.