live better and do more what he liked. His house in Jernyn Street being now altogether too small for his ideas and the number of specimens he had accumulated, he moved to Leicester Square. Here he bought the lease of a large house with some land back of it, on which he erected a museum. Following his previous architectural efforts, this building was of a peculiar style and arrangement. On the ground floor was a lecture theater; above this was a long gallery, — the museum, — and alongside dissecting-rooms and places to make preparations. But of course the principal feature of the entire establishment was his museum. It was the great labor of his life and the principal record of his deeds and opinions. To this object besides he spent the greater part of his money. The collection consisted of fourteen thousand specimens with which there were ten folio volumes of manuscript, various catalogues and an immense number of drawings. The specimens were not taken from any particular science, but covered the entire realm of nature. There were dissections of three hundred and fifteen animals, and preparations of nearly two hundred others. Then there were many examples of pathological conditions, a moderate number of specimens to illustrate health and disease in plants; and, finally, a few representations of geology and paleontology. Hunter had no concerns about the museum during his life, but the disposition of it afterward was a different matter. He directed in his will that it should be sold to the British government. But England at this time was at war, and money was not plentiful; it did, however, after a great deal of delay, give the meager sum of £15,000. This was accepted conditionally; and it was then turned over to the Royal College of Surgeons. Curators have been appointed from time to time to look after the original collection, and add more to it. So that at the present time it contains far more than the number of preparations left by its founder. "And although the greater part of the Hunterian Museum is in one sense not the handiwork of Hunter, the whole is, in a far higher sense, for it is merely by following his initiative that men far inferior to him in genius have built up this great national monument."

Though naturally kind-hearted and affable, he became toward the end of his life to be persistent in his ideas to the point of irritability. In fact, he says of himself: "My life is in the hands of any rascal who chooses to annoy or tease me." Of course he was the most prominent surgeon at St. George's Hospital; and it was the custom of the day for the pupils' fees to be distributed equally among the members of the staff. This seemed somewhat unfair to him, and he was further embittered against his colleagues by a set of regulations they drew up — in regard to surgical pupils — without referring to him. It so happened that in the fall of 1793 two Scotch lads came to him for positions in the hospital. He told them that they could enter, but that it would be necessary for him to consult with the

board at its next meeting. This came on a Wednesday morning. On this day he started from his house in good spirits, and made a visit before he went to the hospital. When he arrived there, he found the meeting already in session. He presented the memorial from the young men and spoke in their behalf. One of the staff flatly contradicted what he had said. "Then came the end. Angina seized him. He turned toward another room to fight out his pain by himself and Dr. Mathew Baillie followed him. He went a few steps, groaned, fell into Dr. Robertson's arms, and died."

His character is well expressed by Gross. "John Hunter was a man of vast designs, of noble deeds and of extraordinary genius, one of those rare beings whom an all-wise and beneficent God at long intervals sends into the world to astonish and enlighten mankind; and to direct the human intellect into new channels of thought and action. The sparks which were emitted by Hunter's genius kindled a flame that set the medical and scientific world on fire."

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THE VALUE OF INTRA-UTERINE DOUCHES, PACKING AND ANTISEPTICS IN THE TREATMENT OF MISCARRIAGE. A STUDY OF THE RESULTS IN TWO THOUSAND CASES.

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THE use of intra-uterine medication owes its origin to Hippocrates,¹ who made use of injections into the uterine cavity for the treatment of metrorrhagia, and to wash out pieces of placenta. According to Kob,² Galen was also familiar with this practice and was the first to employ it in the treatment of hemorrhage during the puerperium.

Although other eminent physicians advised and employed intra-uterine injections, chiefly for non-puerperal diseases, it was not until the demonstration of the infectious origin of puerperal fever by Holmes,³ in 1843, and Semmelweis,⁴ in 1847, and the dawn of the antiseptic and aseptic era, that their use for the prevention and treatment of puerperal sepsis became widespread.

Bonnet,⁵ in 1850, was the first to employ them in a case of puerperal infection, but with unsuccessful result. Von Gruenwaldt⁶ appears to have been the first to adopt their general use in puerperal sepsis, and met with such success that he subsequently instituted the practice of giving an

intra-uterine douche to every patient two to three hours after delivery as a prophylactic measure.

As the employment of intra-uterine douches increased, reports of peritonitis and sudden death following their use led Auvard ⁷ to devise a return flow douche tube, and Olshausen ⁸ to expound the theory of air embolism.

The prophylactic use of intra-uterine douches in uninfected cases was soon abandoned except after operative labors and miscarriages. At first various antiseptics were employed, — chloride of lime, chlorine water, thymol, salicylic acid, boracic acid, permanganate of potash, carbolic acid and corrosive sublimate, — but with the popularization of the two last antiseptics in general surgery, the use of the others for intra-uterine douches was gradually abandoned; and reports of poisoning by the absorption of carbolic acid and corrosive sublimate led to the substitution by most obstetricians of sterile water or salt solution. In 1896, Corossa ⁹ introduced alcohol as an intra-uterine antiseptic, and in 1910, Polak ¹⁰ advocated the use of a gauze strip saturated with tincture of iodine as an intra-uterine antiseptic in infected cases.

Packing the uterus for the purpose of controlling hemorrhage was first described by Leroux,¹¹ in 1776; but little attention seems to have been paid to it until 1887, when Dührssen ¹² introduced the use of uterine packing after curettage for miscarriage and later for post-partum hemorrhage. Dührssen's writings soon led to the general acceptance of this form of treatment. He used iodoform gauze, which is still popular in spite of occasional reports of poisoning. The first instance of poisoning from the use of iodoform in the uterine cavity was reported by Dr. Elbridge G. Cutler,¹³ of Boston, in 1886, who at the same time collected seventy-seven published cases of poisoning from its use in other wounds.

In a previous article the writers ¹⁴ have discussed the results of the treatment of 2,000 cases of miscarriage. The present paper is based upon the same material as the former, but deals only with the results of certain methods commonly employed in the care of such cases, attempting to show their relative worth, in so far as it is possible.

The number of cases does not total quite 2,000, as those admitted with advanced sepsis and those in which no operative procedure was undertaken have been excluded, in order that conditions in all instances might be as nearly identical as possible. Obviously neither cases with advanced sepsis nor those in whom operative treatment was unnecessary have any bearing upon the subject under consideration.

While a number of observers have reported their results in the treatment of miscarriage, the writers have been unable to find in the literature a comparison, under otherwise similar conditions, of the points with which this paper attempts to deal.

Although cultures were taken in a large number of our cases, we shall not consider the bacteriological findings in this paper, because the wide variety of organisms present in different cases

would make the results too complicated to be of value. Among the cultures taken from the uterine cavity in 97 infected cases of miscarriage, 28 different organisms or combinations of organisms were recovered. The largest number showed the streptococcus, which was present as a pure culture in only 22 instances, but it is interesting to note that, in these few cases, the findings were essentially the same as in the entire series.

A temperature of over 100.4° F., all other possible causes of elevation of temperature having been excluded by a thorough physical examination, is agreed upon by the majority of writers ¹⁵ as evidence of infection; therefore, the term "infected" as used in this paper will apply to cases admitted with such a temperature, but in which the infection was apparently limited to the uterine contents and decidua. By clean cases will be understood those with essentially normal temperature, even though cultures taken from the uterine cavity in some of these revealed the presence of bacteria. The occurrence of the same temperature (100.4° F.) at any time during the convalescence is taken as the standard of morbidity in clean cases. Among the infected cases, those in which the temperature did not fall to normal within forty-eight hours after curettage are considered as morbid.

The attempt is made in this paper to aid in the solution of five problems:

1. Is there any danger in the intra-uterine douche?
2. Is the intra-uterine douche of any mechanical value after the products of conception have been removed?
3. Is there any advantage in antiseptic douches over sterile water or salt solution?
4. What is the value of swabbing the cavity of the uterus with tincture iodine?
5. Does packing the uterine cavity, to control hemorrhage, increase liability to sepsis?

1. THE DANGER OF INTRA-UTERINE DOUCHES.

The danger of irrigation fluid being forced into the Fallopian tubes, if an effective return flow is maintained, has been refuted by the experiments of Vidal de Cassis, Astros and Petit ¹⁶ on the cadaver. Nevertheless, in our series, there were distinctly more instances of salpingitis following intra-uterine douches, especially among the infected cases, where organisms were of course present in increased numbers.

Below are the tabulated results:

	Number cases.	Number with salpingitis.	Percentage salpingitis.
Clean cases:			
Uterus irrigated,	896	3	0.33
Not irrigated,	267	2	0.75
Infected cases:			
Uterus irrigated,	410	12	3.9
Not irrigated,	55	0	0

In the history of the Gynecological Service there has occurred one case of general peritonitis and one of pulmonary embolism following intra-uterine irrigation. It is impossible to assert that these untoward events were the direct result of this

treatment; yet a glance at the table above does not make the possibility of such an accident appear groundless, particularly in the infected cases.

It may occur to the reader that only the more severe types were irrigated and hence the more frequent salpingitis and greater morbidity; but this is not substantiated by a close study of the series.

2. THE MECHANICAL VALUE OF INTRA-UTERINE DOUCHES.

The primary value of any intra-uterine douche is in mechanically removing small shreds, blood clot and as many as possible of the organisms present in the cavity of the uterus, while the action of an antiseptic, which it may contain, is secondary.

Any advantage which the intra-uterine douche may confer in bettering the end results is best decided by the comparison of a series of cases in which the uterus was irrigated with sterile water or salt solution and one in which the cavity was simply wiped with sterile gauze. Those cases treated with antiseptic douches or medicated gauze must be excluded, since the antiseptics employed might influence the result. The following table shows the result of this study:

	Number cases.	Number morbid.	Percentage morbidity.
Clean cases:			
Uterus irrigated,	345	15	4.3
Not irrigated,	136	7	5.1
Infected cases:			
Uterus irrigated,	138	16	11.6
Not irrigated,	48	3	6.2

This comparison shows that no great advantage is obtained by irrigation over simple wiping of the cavity in clean cases; while in the infected, the percentage of morbidity is nearly twice as great among those irrigated as among those in which the uterus was wiped out with sterile gauze.

We are unable to offer any explanation, unless the organisms are more widely disseminated by irrigation, but feel justified in the conclusion that, in our own series, the intra-uterine douche has offered no mechanical advantage in the treatment of such cases, nor do the end results appear to justify its continued use as a routine in this class of cases.

3. THE VALUE OF ANTISEPTIC DOUCHES.

A comparison of the use of different antiseptic and simple sterile intra-uterine douches is shown in the following table:

	Number cases.	Morbidity in puerperium.	Percentage morbidity.
Clean cases:			
$\frac{1}{2}$ % formalin,	7	1	0
1 to 5,000 corrosive,	305	27	8.8
50% alcohol,	239	11	4.6
Salt solution,	345	15	4.3
Infected cases:			
$\frac{1}{2}$ % formalin,	10	2	20.0
1 to 5,000 corrosive,	143	28	19.5
50% alcohol,	119	22	18.4
Salt solution,	138	16	11.6

It is at once apparent that plain sterile salt solution gave better results than any of the antiseptic solutions tried.

A possible explanation of this fact is that each of the antiseptics favored the coagulation of albumin, thus sealing up the sinuses and raw surfaces and preventing the escape of a certain number of organisms, while salt solution and sterile water prevented clotting to a certain extent and favored free drainage.

In the clean cases, the morbidity after the corrosive intra-uterine irrigations is nearly twice that of either alcohol or salt solution, while even the small difference between the results after alcohol and salt solution should lead us to select the latter.

The outcome in the infected cases shows that salt solution is again by all means to be preferred for an intra-uterine douche, since the morbidity is much less after its use.

The number irrigated with formalin is too small for any conclusions of much value, but is given for completeness.

4. THE VALUE OF IODINE.

We have seen that irrigation of the uterine cavity with antiseptic solutions has given no better results than irrigation with plain sterile salt solution, and that as good, if not better, results have been obtained when the uterus has not been douched but simply wiped with sterile gauze. One further antiseptic remains to be considered, namely, iodine.

This has been used in two forms, iodoform (10%) and tincture of iodine. These have been applied by swabbing the uterine cavity with gauze saturated with the preparation. In many instances, considered in the next section, the uterus has also been packed with iodoform gauze for twenty-four hours. Where the tincture has been used, a strip of sterile gauze saturated with the solution has been left in the cavity from one to three hours in some cases.

The actual value of this has not been determined.

One case among thirty-eight in which an iodine strip was left in the uterus, and one case in twenty-eight which were simply swabbed out with iodine and the cavity left empty, had a morbid convalescence. This is not sufficient data to warrant definite conclusions, but the method seems of value. The statistics from the use of iodine preparations follow:

	Number cases.	Number morbid.	Percentage morbidity.
Clean cases:			
Tincture of iodine,	50	1	2
Iodoform,	24	0	0
Infected cases:			
Tincture of iodine,	25	1	4
Iodoform,	5	1	20

Tincture of iodine has given the best results of any antiseptic used in the uterus, and these figures are also better than those obtained without the use of antiseptics. The statistics given by iodoform are also good but not equal to those by

the stronger preparation. The diffusibility and powers of penetration of tincture of iodine appear to overcome the disadvantages of the alcoholic solution.

5. INTRA-UTERINE PACKING.

In the earlier days of the Gynecological Service, practically all cases were packed after curettage, to control possible hemorrhage. This was gradually discarded as a routine measure, and at present is employed only for unusual bleeding. There are certain border-line cases, however, bleeding more freely than the average, where the operator feels more comfortable to tampon the uterus; especially if the patient is far from medical aid.

Antiseptic packing has been employed as a prophylactic in "clean" and as a therapeutic measure in infected cases. The results are shown in the table below:

CLEAN CASES.

Treatment.	Num-ber cases.	Morbid puer-perium.	Percentage morbid-ity.
Packed with iodoform gauze,	398	22	5.5
Packed with gauze saturated with 50% alcohol,	29	1	3.4
Packed with plain sterile gauze,	285	23	8.0
Left empty,	396	16	4.0

INFECTED CASES.

Treatment.	Num-ber cases.	Morbid puer-perium.	Percentage morbid-ity.
Packed with iodoform gauze,	174	29	16.6
Packed with gauze saturated with 50% alcohol,	30	6	20.0
Packed with plain sterile gauze,	121	10	8.2
Left empty,	159	17	10.7

In the apparently clean cases the use of gauze treated with an antiseptic seems superior to the plain sterile gauze, although in infected cases exactly the reverse is true. The explanation of this fact is probably that in the former group the introduction of an antiseptic destroys the few bacteria which are often present or introduced during an operative procedure, while in the latter the antiseptic is powerless to cope with the larger numbers of and more widely distributed organisms and also lessens the draining power of the gauze. It is also probable that it acts in the same manner as the antiseptic in irrigation. The table shows far less morbidity in infected cases treated with a tampon of plain gauze or where the uterine cavity is left empty. Because of the irritating properties of strong iodine solutions, iodine saturated gauze has not been used to pack the uterus for hemorrhage, nor when used for its antiseptic effect has it been allowed to remain in the uterus more than three hours. Therefore we have no basis of comparison between tincture of iodine and the other antiseptics which we have employed for this purpose. A weaker iodine solution (3 or 5%) might be safely tried; but we have no statistics to establish its value.

Of those antiseptics which have been used to saturate gauze packing at the Boston City Hospi-

tal, alcohol has given the best results, but, as we have shown, in infected cases plain sterile gauze is superior to any antiseptic gauze which has been employed.

CONCLUSIONS.

I. Salpingitis has been more common after intra-uterine douches.

II. Intra-uterine douches of sterile water or salt solution have not given as good results as simply wiping the uterine cavity with sterile gauze.

III. Antiseptic douches have given poorer results than simple sterile solutions.

IV. Swabbing the uterine cavity with tincture of iodine has given the best results.

V. Packing the uterus to control hemorrhage does not greatly increase the liability to infection.

VI. For packing, gauze saturated with 50% alcohol in "clean" and plain sterile gauze in "infected" cases have given the most satisfactory results.

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METHODS OF FAVORING PROTEID DIGESTION.*

BY ROBERT B. HUNT, M.D., BOSTON.

THE life and health of a child depends upon several essential factors, and the most important of all these is the diet during the early years of life.

Human milk is our primary requisite, but failing to secure this necessity, or if the child has been weaned, our success at infant feeding depends on our ability to adjust cow's milk by the various methods so that it is better adapted to the needs of the individual baby.

With all our advances in the science of chemistry and physiology, never has any one composed a substance which can replace human milk for the baby. No process of manipulation by the addition of chemical or mechanical agents can convert cow's milk into human milk. This food will often do more for the infant than all the medicine recorded in the United States Pharmacopeia, and, in every case, with but few exceptions, the young child should have the food that belongs to him. The number of babies who have been snatched from death's door by a few feedings of human

* Read at a meeting of the New England Pediatric Society, Oct. 21, 1911.