

ARTIFICIAL IMPREGNATION: ESSAYS IN TUBAL INSEMINATION

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THE only unimpugnable evidence of effectiveness in instrumental insemination comes from our successful and scientific brother the veterinarian. Human tests are blocked by aversions, vitiated by reticences and happy results are not susceptible of rigid scientific proof without prescription of that ceinture applied to their ladies by certain knights departing for the Crusades, as shown in the glass-cases of the Musée de Cluny at Paris. The plausibility of our claims must rest on publication of histories and methods in some detail, yet this is one of the clinical series in which no one observer is able to present a large group of cases. The records will follow. Here the technic is reported on, with a summary of results.

Marriage may be called an experiment in procreation lacking preliminary tests for fitness or instruction in method. In view of these conditions it should be considered satisfactory that successes run between 80 and 90 per cent. Such averages are scant comfort to the one couple in seven or thereabouts that applies to us. Here we are confining ourselves to the particular pair which has been informed by the doctor that little or nothing is wrong or that an operation will put things mechanically right. Such people are entitled to every measure of reasonable promise before resorting to operation. Suppose this insemination does hold out a reasonable promise. Then in time to come the accredited procedure before turning to operation will be this. Man and wife are each brought up to good physi-

cal condition and their sex-life studied and regulated. These measures failing, trial is made of a course of artificial impregnation. (Hymen obstruction or vaginal deformity would have called for mechanical correction, but under adequate supervision conception and safe passage through miscarriage dangers are compatible with anteflexion and mobile retroversion.) The instrumental instillation failing, operation may be done for well-marked anteflexion or retroversio-flexion, particularly in the presence of real pain or disability. Laparotomy on the single indication of sealed tubes to be opened or deployed is generally frowned upon because of a common agreement in the reports of scant success. Laparotomy to study and incise the ovaries where it is supposed ova need freeing has an advocate in Reynolds. Laparotomy after six months of marriage just to find out what can be the matter with a woman who appears to be sound has been urged only from Dublin. Whatever the program that appeals to any student of the question there will hardly be denial that better knowledge is needed concerning what constitutes normal sex-life, concerning the male secretion, and genital incompatibilities and these physiologic deficiencies. Nor can some or all of the following considerations be passed by in any particular problem under review.

PRELIMINARIES. Verification of the male secretion will one day be the routine first step. Two or three microscopic examinations are needed. Semen does not run true to form. It is a gauge very sensitive to changes in general physical condition and may present quick and sweeping alterations without apparent adequate reason. Activity of spermatozoa is of major importance, but survival hours are all-important too. Stated in the baldest terms, the two requisites are that in the fresh warm specimen seen in the deep-covered slide speedy transits across several fields should be under way, and, furthermore, at room temperature, activity should persist for hours. One may see the trapped tail, the feeble stroke, short-lived action or even azoospermia yield to a vacation or reduction of obesity, and such betterment, combined with cure of the commonest sterility lesion in women, endotrachelitis, sufficient to start a family.

Coitus is to be regulated. Prolonged intervals may produce as poor specimens as undue frequency. An individual has a normal cycle which will deliver the best result, and this might be worked out, but seven to ten days is a fair average for the liveliest persistence in my few studies of multiple specimens.

On the part of the woman correction of flabby or rapid obesity counts, as do general condition, good periods and sex responsiveness.

Leucorrhœa of an acid or purulent character is to be arrested, and this goes hand in hand with its main reason, unhealthy states of the lining of the cervix. The spectacular cures are those in which healing of the raw surface or drainage of the clogged canal is instantly followed by conception.

The mild alkaline douche an hour or so before coitus is in use for acid vaginal secretions and will be used even when litmus does not make any such accusation. I cannot get a chemist to devise any simple quantitative test of vaginal acidity.

Studies of the reaction of a vaginal secretion on a particular semen is of limited application to most doctors in office work and tests carried up into the cavity of the uterus are subject to too many errors to belong to any but a few experimenters. Some of these mooted points are touched on in the second paper.

Retention of semen by a condom-covered tampon inserted at once after emission may be tried when the vulva gapes, but my various experimental modifications of pessaries to develop a semen trap have not worked.

Tests of the patency of the tubes will be routine when the procedure is standardized. I tried Cary's injection of silver salt, with vague roentgen shadows. Cary's simple instillation of sterile fluid in the genupectoral posture is promising. If it disappears in quantities over 10 minims the way should be clear. My trials that show free passage of semen have demonstrated patency in the same way. These are infinitely easier, though less certain, than the injection of oxygen and its appearance under the diaphragm—calling as oxygen does for apparatus and special skill—and not without distressing sequelae.

Lastly, we rule out of consideration patients with gonorrhoea or suspicion thereof, tubal distention or tenderness and inflammatory processes of any degree in the pelvis.

TECHNIC. During the office examination one selects the shortest or smallest bivalve speculum that will make a good exhibit of this particular cervix in the knee-chest position, and also tests a snug-fitting curved pipette in the internal os. A note or mark is made on the pipette to show how far up 10 minims will fill its caliber. After a date is made—to follow a week of continence—the husband is given a sterile test-tube, dry and corked. He is directed to wash carefully and secure a friction specimen about an hour before the appointed time, taking care that the inside of the cork makes no contacts and to keep the tube warm but not hot, under a warm water bag or in a thermos bottle. He is to verify by telephone a successful production.

The following are sterilized: Bivalve; single tenaculum; two or three pipettes in test-tubes; applicators, cotton-tipped, and towel and tray on which to lay out the above. (Forceps and scissors in case condom specimen is to be used.) All water is to be dried out of the pipettes.

At the home some third person is to be near at hand though not necessarily in sight. Good illumination is needed—drop-light and head-mirror or head-light preferred. Bladder and bowel are empty. All the materials are spread conveniently at hand. The patient takes a real knee-chest posture at the edge of and across the bed. The bivalve gives a clear view of the ballooned vagina, and also a free play to the uterus such as cannot obtain with this instrument in the dorsal posture. This free play is important in gaining ready access to the cavity of the uterus. The tenaculum steadies the cervix and serves to draw open the canal, which should rarely need to be wiped and on which no antiseptic should be used. The pipette is now very gently filled above a point known to be 10 minims. (The uterus holds 8 to 10 minims.) The tip touches first the interior of the cervical canal as high as may be and is passed to near the fundus. The fit to the internal os prevents regurgitation,

DESCRIPTION OF FIG. 1

FIG. 1.—Methods on trial in past years. Part of author's exhibit at the International Congress in London in 1913. The condom as the reservoir, pipette instillation, clip closure of cervix. 1. The neck of the condom twisted, after ejaculation, without removal from the vagina. 2. The tampon that is introduced before rising to hold the condom in place in order that the patient may come to the office. 3. The patient in the knee-chest posture. 4. The speculum in place. 5. The cover steadied with a forceps and slit, as seen in 6, 7 and 8. The Skene pipette, sterile dry and warm, sucks from the slit and injects as shown in 9, into or through the tube, as 10 gives it diagrammatically; 11 is ready for the clip. 12, placed by a Bozeman forceps as seen in 13, before and after placing. Alternate plans are given in A, and B the condom uncoiled with its head still in the vagina, C, the pipette passed into it; finally D, employing a bivalve in lieu of a Sims speculum when one dispenses with a nurse.

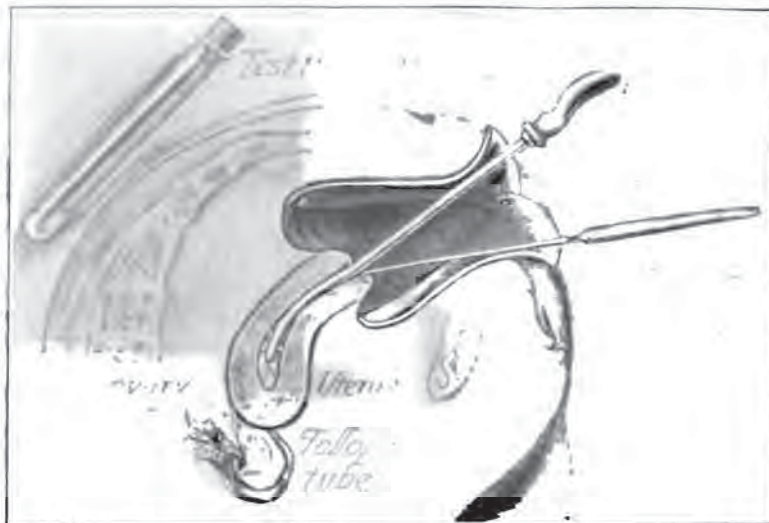


FIG. 2.—Insemination, using a short bivalve speculum, a single, well-angled tenaculum; a pipette with the curve of a uterine sound and of a size to fit the internal os, and a large rubber bulb. The body of the uterus is shown distended with semen.

or, if it does not, one makes a change. Gentle, steady pressure is made on the bulb until "unwell feelings" are produced and continued until there is consciousness of slight distress in the sides of the abdomen low down, at which time the Fallopian tubes are presumed to have fluid in them. Then pipette, tenaculum and speculum are withdrawn and the patient slides onto her side with the hips a little elevated, to remain thus at least an hour.

The Skene uterine pipette is a bit thicker than a uterine sound and curved like the sound. Its opening must not be minute, as Huehner's curled-up forms of defunct spermatozoa are produced by quick suction through narrow orifices. The advantage over any syringe is that the contents are all in sight, the interior is easily cleaned and various sizes are at hand. The sharply recurved single hook of Emmet does not give the discomfort of the heavy double forms.

Variants in the above methods. As a substitute for ejaculation into the test-tube one is reluctant to concede the use of the condom, as it presents many more possibilities of contamination. The vulva and the penis are washed and coitus occurs with the condom. The contents may be kept warm in two ways: One way is to tie the mouth and drop the condom into a test-tube, which is laid under a warm water bag. The other takes care to leave the cover and its contents within the vagina, twisting the part hanging out and returning this part inside the passage. Under these circumstances there can be no danger of chilling or overheating and thus damaging the specimen. When ready to inject, the patient having taken the knee-chest posture and the speculum being in place, the condom is steadied with forceps and slit with scissors to let the pipette suck out the amount needed. When insemination is done at the office this has been the usual method, the condom having been retained by a tampon furnished to and placed by the patient. Finally it may be noted that one genito-urinary specialist obtains a fresh specimen for injection by providing facilities for coitus at the office.

When autoerotic or cover processes completely inhibit a spec-
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imen may be obtained by slipping the mouth of a sterile test-tube within the opened labia immediately upon withdrawal. Washing of the genitals of both should have preceded this also, and it is a last resort. The device is worth remembering, however, for another purpose. This method of collection is the only one by which semen can be secured in sufficient quantity to be passed upon in those instances in which a man avers that he is desirous of having children but declines to take the steps necessary to prove that the lack is not his. Some such plan is needed when he asks or consents to operation on his wife but declines an essential preliminary, since no surgeon nowadays is excusable for any operative measure (or course of treatment) on a woman for sterility until he can vouch for a good quality of male product—a product, moreover, which must be shown to be existent at the present time and not merely capable of fecundation in years gone by.

OBJECTIONS. 1. The possibility of infection of tube and peritoneum cannot be excluded, but normal insemination involves something travelling an inch an hour from the vagina—after labial and subpreputial “amears”—up into the uterus or tube or peritoneum, and all canals exhibit some reverse currents. If we use semen that has spurted clean into a sterile test-tube and the cork is safeguarded a specimen above reproach seems to be furnished. To be sure, material from the canal of the cervix may be carried on the tip of the pipette and thrown into the tube and reach the peritoneum. (Curtis has posted us on bacterial travels.) But in the absence of gonorrhoea, of mucopurulent leucorrhoea or cervical catarrh production of salpingitis or peritonitis seems to the writer unlikely with a good technic. As far as symptoms go I have to report, among 31 women, none with a uterine colic, one with a half-hour tubal colic and one in bed several days with discomfort but without exudate or tender tube.

2. Old tubal disease may be lighted up anew. It may, for a tubo-uterine orifice never closes. For the present at least such cases should be avoided.

3. It is possible that all that injection of semen accom-

plishes is to open the tube, in which case other fluids would do as well and antiseptically be safer, as used by Stone and Bovée. Only tests can tell.

4. One can have no assurance that coitus subsequent to the treatment was not the real agent in procuring conception. Entirely true, and the reason the veterinary surgeon can offer proofs we cannot.

5. It fails with semen not vigorous. There is the rub. It was devised for just such cases and it has not helped so far.

6. The field is very limited because patients revolt at the idea or give it one trial instead of half a dozen. They prefer laparotomy. All this is exact, but it does not relieve us of the responsibility of preventing the patient taking the greater risk should there be a safer, simpler way, did we but have the will to face the distastefulness of working it out.

UTERINE INSTILLATION INSUFFICIENT. The material injected into the cavity of the body of the uterus seemed to drain out promptly. This was probably because of the intermittent contractions, normal and constant, in non-pregnant uteri and because a degree of opening up of the internal os had occurred in making the deposit. To overcome this, vaginal tampons were tried and abandoned. A clip was built to snap on the cervix and prevent exit of the semen, but it was not effective. Therefore the deeper placing of the seed was undertaken. All good results have been since this time.

REPETITION. Three attempts at monthly intervals should be the minimum and six should be asked, explaining that this is no unusual time for normal means in normal people to require. As to the time of the month, three of our conceptions followed injection within a week of the expected period, the period coming on incompletely.

SUMMARY. In women presenting histories or pelvic findings pointing to the sealed tube following milder types of salpingitis, entirely quiescent, injection into the uterine cavity of active semen produced no results in twelve instances. Strong pressure was not deemed warranted.

In women with no gonorrhœal histories or findings, free

from cervical inflammation and evident uterine, tubal or ovarian lesions or abnormalities, living semen of the poorer grades produced no results in nineteen patients. No infection followed except in one possible instance, and that of mild type. Several of these received three trials.

With normal pelvic organs and semen showing multiple quick travellers, living some hours at room temperature and examined just before injection, five pregnancies followed and are believed to be due to tubal insemination. The knee-chest posture, the curved pipette carried to the fundus and fitting the internal os, injection into the tubes and horizontal rest afterward are considered important. Trial of this method may well precede resort to operations for sterility, excepting those done for external obstructions.

DISCUSSION OF THE SYMPOSIUM ON STERILITY
(PAPERS OF DRS. CHARLES G. CHILD, JR.,
AND ROBERT L. DICKINSON)

DR. EDWARD REYNOLDS, Boston.—I think Dr. Child is to be congratulated on his showing of operative work in tubal sterility. Seven successes is a large number for any man. He did not tell us what the total number of operations was. We may assume that it came from a large series of operations, because it is the universal experience that the percentage of successes in opening closed tubes is small. To have gotten as many even from a large experience he must have done nice work.

My own experience is that tubal cases are very unsatisfactory cases for operation. We get few successes. On the other hand, my experience is that cases in which the trouble is in the ovaries are extremely favorable. I am having the records of my cases looked over, and I hope in the near future to be able to present the end-results of my series. I have worked over them enough myself to be sure I am able to present a good percentage of successes after conservative operation on the ovaries wherever the tubes were in good condition. Where one tube is in trouble

and the other is normal, *i. e.*, a mild salpingitis on one side, a closed tube without much change in it, while the other remains normal, the woman is invariably sterile. Microscopic examination of the secretions will teach any one familiar with them that there is drainage from the affected tube into the uterus and this fluid destroys the spermatozoa. In practice, if you find on operation that one tube is normal and the other tube closed, complete removal of the injured tube, the closed tube, with exsection of its interstitial portions from the cornu, will almost invariably, in a very large percentage of cases, result in immediate fertility if the husband is thoroughly good. Those are the only favorable tubal cases I know of.

Artificial impregnation is a subject of a good deal of interest, and one of which I am rather skeptical. Dr. Dickinson has reported the cases of three women, with success in two of them. That is a higher percentage than is usually obtained, and perhaps due to his method of injecting the tubes.

I would take issue with the statement that these results can be obtained better than by operative work. It is not a high percentage as compared with the other work. I do not believe it is free from risk. I have seen in the course of my experience a considerable number of cases who had artificial impregnation attempted and a pretty large proportion of them have had tubal trouble. I do not believe artificial impregnation usually has a high percentage of success, not that it is altogether harmless.

As regards urging semen through the tubes, it strikes me as unphysiological. I should want to see a large number of successes before I was ready to use it. In nature semen never reaches the tubes. In natural impregnation postcoital examination shows that the non-living seminal elements do not even enter the uterine body. The cervix is full of them. The spermatozoa, and the spermatozoa only, go higher by unaided motility. The use of artificial insemination promiscuously without careful isolation of these cases which are due largely to cervical obstacles, I believe to be thoroughly unscientific and not free from danger. It comes down, in short, to the general principle that the routine adoption of any procedure for a condition which is the result of multiple and varying causes is poor practice. When cases have been isolated as appropriate for artificial impregnation, it is another question.

DR. JOHN O. POLAK, Brooklyn, New York.—I think the keynote was struck by Dr. Reynolds as he sat down, and that is individualization of the cases of sterility. It is remarkable in the study of these cases to see how many of the male elements are inefficient. In a study we made and presented to this Society of 687 cases, there were 301 of these women who were free from inflammatory histories that could be considered as possibly becoming pregnant; that is, free from a definite gonorrheal or postabortal history. Out of this number of men to whom these women were married, it was found that 90 of the men could not impregnate the women because they were sterile.

An interesting point was brought out by one of the speakers—Dr. Dickinson, I think—was that they seemed sterile today and non-sterile tomorrow. I have had a number of these cases where reports have come in of men who were sterile, and yet with little treatment the women have become pregnant. These men may have lived with their wives for two or three years without any pregnancy having taken place. We would send them back and we would find them sterile again, and after treatment they were able to produce another offspring.

Personally, our experience has been that the largest proportion of our cases of sterility are due to endocervicitis and some change in the secretion at the cervix. Here again, it is remarkable how the cervical secretion will change in the same woman. Women will go for periods of eight or ten years sterile, yet with the simple application of practically nothing to the cervix outside of such remedies as iodine and glycerin they promptly become pregnant after that treatment. There is no question in our minds that endocervicitis is a great factor.

I congratulate Dr. Child on his report. I have done 100 salpingostomies, and one woman has had three children from a resected tube. I have had seven ectopics as a result of my salpingostomies, which is interesting, and probably due to a defective procedure I carried out.

In regard to Dr. Dickinson's proposition, I feel very much as Dr. Reynolds does. I should like to know the cause of the sterility and would like to be reasonably sure before injecting semen into her uterus. I have tried it several times, and I have gotten a reaction because I made such a bad selection of cases. I have dropped it, and I now refer those cases to Dr. Dickinson.

DR. ISADOR C. RUBIN, New York City (by invitation).—The papers of Dr. Child and Dr. Dickinson have been very interesting to me. I wish to congratulate Dr. Child upon his brilliant results. It would be well to know the total number of cases he had operated on for the condition of tubal occlusion, and especially those in which he had no success.

The value of a test other than surgical to determine whether tubes are occluded or not can be illustrated in 2 cases in my experience. One occurred in my practice a number of years ago. A woman had been married three years and was sterile. I found in making an examination a slight thickening on either side of the uterus. I went over the possibilities with this patient, tried all tests, and found her husband absolutely potent, and decided I would give her the benefit of a tracheloplastic operation. She remained sterile. A year and a half later I heard indirectly from a colleague that she had been "butchered" by the operation; that is, that was the conclusion she came to following the consultation of a certain gynecologist, and she visited many others for relief of her sterility. She was then told that the cause of her sterility was the torn cervix (post Pozzi); also that she had definitely diseased tubes and ovaries due to infection resulting from my operation. It was very disagreeable naturally to hear these things about an innocent operation. If it had only been possible for me to have her consent to a laparotomy at the same time that I did the Pozzi operation or could have employed some method whereby I could determine whether the tubes were patent or not, I would be in a better position to defend myself.

The second case I had three weeks ago. Returning from the New Orleans meeting of the American Medical Association I found a case in the ward at Mt. Sinai that well illustrates the value of such a diagnostic method. The patient had been married three years and was sterile. She had been examined by the staff and a slight thickening on one side was made out. Four days before my examination of this patient she had had a curettage and stem pessary insertion calculated to relieve her sterility. I removed the stem pessary and introduced oxygen into the uterus and found the tubes absolutely non-potent. We did a laparotomy the same day and found bilateral hydrosalpinx. Both tubes were slightly adherent, but not very much distended, the walls being flaccid, therefore accounting for the

practically negative physical examination. This case was typical of numerous cases in which the same or similar procedures are done to cure sterility, and yet the cause of the difficulty is not in the cervical canal but rather higher up in the tubes. The method of intra-uterine inflation with oxygen to determine patency or occlusion of the Fallopian tubes by establishing a pneumoperitoneum or failing to establish a pneumoperitoneum can make the indication for the type of operation that should be done. So far I have tried this method in 100 cases, that is since November 3, 1919 to date, and have found it absolutely safe, well tolerated by the patient and reliable for the data for which the method was intended.

With reference to Dr. Dickinson's paper, there is no doubt that his results are most encouraging. I was especially interested in his observation that the uterus does not tolerate fluids like collargol, thorium and silver injections. I found this to be the case in my early experiments. Oxygen, however, is very well tolerated up to a certain pressure. These women complain of slight pain from the intra-uterine pressure and distention varying for the individual. The pressure ranges between 50 and 70 mm. in the average patent case. When the tubes are occluded the pressure rises to 210 to 220 or more. I do not recommend carrying the pressure beyond 200. In those cases we have had an opportunity to test and control later by laparotomy we found the tubes to be closed where the pressure was 200.

DR. GEORGE GELLHORN, St. Louis, Missouri.—Nine years ago I presented a paper on salpingostomy in pregnancy, and at that time I reported the case of a woman who had conceived. She has had a second child since. I have had 2 more cases which terminated in miscarriages. This, of course, has nothing to do with the operation. I have done in all about 40 salpingostomies. I have, however, never done an operation solely for the purpose of opening tubes, but only when I found the tubes occluded in the course of a laparotomy have I opened the occluded ends. The number of operations was further cut down by the fact that I excluded all cases of inflammatory origin. The condition of the tube, more particularly, the thickening of the walls, was the first criterion. In short I limited the operation to cases where the occluding factor apparently came from without the tube rather than from within. This, then, leaves practically

only those cases of tubal occlusion for operation, which have been caused by a previous appendicitis or ectopic pregnancy. If performed with such limitations, salpingostomy carries with it no dangers of any kind.

DR. N. SPROAT HEANEY, Chicago.—I would like to ask if any particular time was observed in relation to the menstrual periods in these cases that were injected?

I have been considerably interested in the question of sterility because of the fact that in addition to being a gynecologist and obstetrician, I am a dairy farmer. Sterility in the dairy world is an important topic and is of the greatest economic importance at the present time with high priced foodstuffs prevailing.

Last fall we were awakened to the fact that about one-half of our dairy herd was sterile. We called in a veterinarian and had the whole herd examined in order to separate the pregnant from the non-pregnant animals. The records of the non-pregnant animals were looked up and we found out when they had last conceived. In working with live stock we do not have the difficulty which Dr. Gellhorn mentioned and which makes the question of sterility in gynecology hard to become interested in. It takes such a large number of cases in order to reach any logical conclusion. In the dairy world we can follow each case to a logical conclusion. Examination of the bull showed that he had perfect semen. We found ten cows sterile. When a cow does not conceive after two services, something is the matter with her. Ordinarily such cows are sent to the butcher, but in a pure bred herd such a procedure represents a big sacrifice. One of these cows had an infantile uterus and after killing her, autopsy supported the clinical diagnosis. A second cow, a very valuable animal which had recently miscarried, due to specific abortion, which miscarriage was followed by septicemia, showed upon examination a large swelling of the left tube and ovary. Examination produced a recurrence of fever and the cow became very sick. Upon killing this cow we found she had an extensive tubo-ovarian abscess. All the remaining cows showed normal genitalia, except for extensive cervical erosions and high grade endocervicitis. These cases were all treated with applications of iodine to the cervical canal for periods of two or three months until satisfactory local conditions were obtained before rebreeding. Six of these cows are either now pregnant or have delivered.

Two of these cows resisted treatment so that recently I operated upon them. In each I did a dilatation of the cervix and an amputation of the cervix following the technic very closely that I use in the human. These cows have patent cervices and I feel confident that the operation will be successful.

DR. HERMAN J. BOLDT, New York City.—I would like to ask Dr. Child what he means by resection of the ovary in his cases. It is very interesting to me to hear his report, and I congratulate him on his results. I consider it the most valuable contribution that has been made on the subject to date, particularly with regard to the diagnosis to determine whether a tube is patent or not.

With regard to operations on the Fallopian tubes, a large number of patients are sent for operations upon the Fallopian tubes, recommended by gentlemen whom they have consulted, the family physician or otherwise, where careful examination has failed to show any pathologic condition of the Fallopian tubes, and for that reason, if we can determine that such tubes are patent, it is all right, but to open the abdomen and do tubal operations without any objective symptoms is not a correct procedure.

One word in favor of the general practitioner. There was a time when it was found that in 90 per cent. of patients who consulted physicians for sterility the husband had not been examined.

DR. LEWIS S. McMURTRY, Louisville, Kentucky.—The very basis of a satisfactory consideration of this subject is presented in the remark of Dr. Reynolds in the discussion, and that is, the causes of sterility are so multiple and varied that there cannot be any scientific elucidation of the subject until we know more accurately the causes of sterility in both male and female. Let us see some of the contra-indications that we encounter. In the first place, it is common observation—more common years ago than at present—that in multiple lacerations of the neck of the uterus the operation of trachelorrhaphy, restoring the cervical canal, closing it, as it were, is very frequently followed by pregnancy when years have elapsed without conception. On the other hand, the most abused operation perhaps in gynecology, especially in the hands of the general practitioner,

consists in forcible dilatation of the cervix uteri in an effort to cure sterility. Young women get married, go for two or three years without conceiving, go to a physician, and at once he proceeds to dilate the uterus and perhaps do a curettement at the same time, thinking she will, as a result, conceive. That is a contra-indication. We close the uterus in 1 case, and in another open it.

There is something about the internal secretions that has a great deal to do with sterility, although our knowledge of it is incomplete at the present time. Let me mention this one observation. In the mountains of Virginia, Kentucky and Tennessee, where people lead the simplest life, and where they have the poorest obstetrical attendance, where gynecologists are unknown, the families are large, six to twelve children in a family. Undoubtedly the frequency of infection is lessened by their isolation and simple mode of life.

DR. CHARLES G. CHILD, JR., New York City (closing the discussion on his part).—In answer to Dr. Boldt's question as to what I mean by resection of the ovaries, I will say that I had reference to those cases in which the ovaries are enlarged, studded with multiple cysts and the cortex thickened, that the Graafian follicle could not rupture and discharge its ovum, as denoted by the absence of any scar of a previous rupture. In both of these cases one ovary was decapsulated, that is, the capsule was stripped off to get rid of the thickened covering, and in 1 case the other ovary was resected as well.

DR. ROBERT L. DICKINSON, Brooklyn, New York (closing the discussion).—If it works on the cow it might work on the human individual that has nine months gestation also. I wish a veterinarian had told me of the insemination of cattle because I understand that is a regular performance nowadays.

I can add 2 further cases to those spoken of, two of Dr. Carey's. This work means that this kind of thing is worthy of trial.

I should like to emphasize again the fact that semen does not enter the uterus true to form, and that we have got to study our semen.

Slemons has published a paper in which he reports 186 laparotomies and advises that where a woman does not conceive she should be subjected to laparotomy and something done to

her uterus, ovaries and tubes. He has cured most of his cases by this means.

Dr. Gellhorn raises the objection that you cannot examine the husband. You do not have to examine the husband. You can give the woman one of the rubber bulbs that they use for injecting various fluids into the urethra of the male. She takes that to bed with her, puts it under her pillow, and immediately after coitus she slips it into her vagina, and she has a specimen to bring to your office.

Lastly, I wish to repeat that unless we begin to report these cases we will never have any reliable data from which to draw conclusions.