

SECTION VII.

FOR CONCEPTION, SEMEN WITH LIVING SPERMATOOA
SHOULD BE DEPOSITED IN THE VAGINA AT THE
PROPER TIME.

THIS proposition naturally involves three considerations:

- 1st. The nature and properties of semen.
- 2nd. Its passage to the cavity of the uterus; and
- 3rd. The proper time for this.

The seminal fluid, as ejected in the act of copulation, is composed of the secretion of the testes, mixed with that of the vesiculæ seminales, prostate and Cowper's glands.

The office of the testes is to secrete the semen, which is composed of the liquor seminis, granules, and spermatozoa.

If we take a drop of semen from the vagina immediately after sexual intercourse, and place it under the microscope, we shall see the hurried movements of seemingly thousands of spermatozoa. But this is not the best way of studying the phenomena of their movements. The best plan is to take a drop of mucus from the canal of a perfectly normal cervix uteri some fifteen or twenty hours after sexual intercourse. We shall then be better able to examine the spermatozoa; for we shall see them in the fluid that serves as the means of their finding their way towards the ovum. We shall find them moving more slowly, more cautiously, if the term may be allowed. Suppose we select any one sperma-

tozoon for observation, and note particularly its various actions and movements. It will swim first one way and then another, or move in a straight line across the field of vision; and perhaps turn abruptly to retrace the path already traversed. If it encounters a large epithelial scale it stops, places its head against it, as though trying to push it forwards; and when it fails so to do, it turns and moves off slowly in another direction, perhaps to encounter another opposing obstacle, to pause a moment and make another effort to overcome it, and then to turn again in search of some new field of exploration.

Fig. 136, *a*, represents the appearance of spermatozoa in a normal state. With the spermatozoon motion is life, and as long as it lives it moves. When the tail ceases its movements, the organism is dead. The alternate lateral movements of the caudal portion drive the

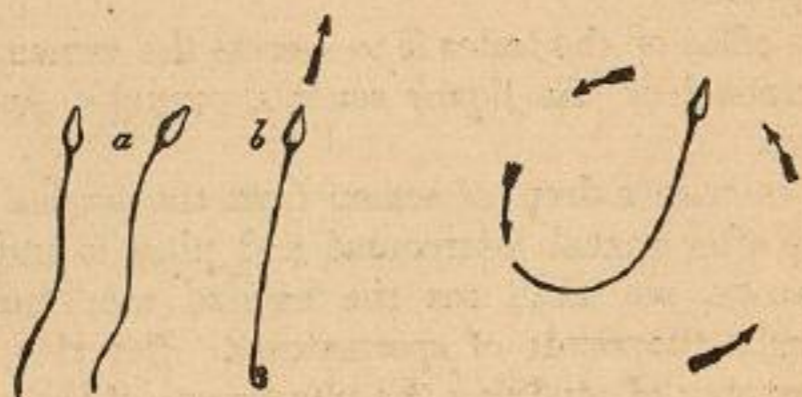


FIG. 136.

FIG. 137.

head forwards. If by any accident this be injured, then the movements of the body or head are in accordance with the nature of the power exerted by the injured part.

For instance, if the extreme point of the tail should be curled up, either by an injury or be held so by

inspissated mucus, as is represented in fig. 136, *b*, then the movements of the spermatozoon will be in a straight line, as shown by the arrow. If the injury be such as to give a permanent gentle curvature to the middle of the tail, as shown in fig. 137, then its movements will be in a circle, because the extremity drawing constantly against the resisting fluid always in one direction, will, of course, drive the head always in a corresponding direction. For instance, if the tail be permanently turned to the left, as here represented, then, with every contraction of it, the head will be driven round to the left; and if to the right (fig. 138), then it will turn in a circle to the right. But when we find a spermatozoon injured so as to be doubled on itself in the middle, with



FIG. 138.

FIG. 139.

the tail reaching up by or beyond the head, as shown in fig. 139, then its movements will be in the opposite direction to the curvature, because the moving power will be expended at the very end of the caudal portion, and this force necessarily drives the head in an opposite direction.

Spermatozoa cease to move only when life is extinct. Under favourable circumstances, they live many hours; but under unfavourable circumstances they die quickly. For instance, any great variation in temperature is fatal to their existence.

For impregnation, the semen must contain living spermatozoa. It has been pretended by some that it may take place without them. They are to be found in all animated nature. I should as soon think of conception without the presence of semen, as to suppose it possible without spermatozoa.

A short time ago it was generally supposed that sterility was a thing that belonged almost wholly to the opposite sex. Mr. Curling* has recently brought this subject prominently before the profession, and has established very conclusively that sterility in the male does positively exist, and that it may depend upon—

1st. Congenital malposition of the testes.

2nd. Chronic inflammation of these glands; and

3rd. Stricture.

In the first and second, the testes fail to produce spermatozoa; in the third, the semen regurgitates into the bladder.

When the testes are retained in the abdomen, they seem to remain in a rudimentary state, and never attain the power of secreting semen with spermatozoa.

Mr. Curling's admirable paper contains a number of cases illustrating this fact, and he arrives at the very just conclusion that the semen of such testes being devoid of the fructifying principle, is wholly incapable of procreation. Mr. Curling says that Mr. Poland and Mr. Cock have each seen cases of procreation where the testes never descended into the scrotum; but in neither of these cases had the semen been examined microscopically. The inference in both instances is

* "Observations on Sterility in Man," with cases. By T. B. Curling, F.R.S., Surgeon to the London Hospital, &c. Reprinted from the *British and Foreign Medico-Chirurgical Review*. April, 1864.

plain: either that there are exceptions to the rule that a retained testis does not furnish spermatozoa; or that the claims to paternity in their cases were entirely out of the question. The latter the most probable, as there are no facts to substantiate the former.

In the French school this subject has been very thoroughly investigated. The writings of Goubaux, of Follin, of Gosselin, and Godard, all go to prove that a retained testicle is, as a rule, whether in man or animal, incapable of producing spermatozoa, and that semen without spermatozoa is incapable of procreation. In some instances, one testis has been found in the abdomen, and the other in its normal position in the scrotum; and here, the one has invariably been deficient, and the other prolific in spermatozoa.

But while the presence of spermatozoa is essential to fecundation, their absence has no sort of influence upon impotence. By impotence, we understand an incapacity for copulation; by sterility, an incapacity for fructification. Thus a man may be impotent and not sterile; and sterile but not impotent. I have known many men who performed the act of coition with the greatest vigour, whose semen was perfectly devoid of the slightest trace of spermatozoa; and on the other hand, how often do we encounter those who are incapable of the least effort at copulation, but whose semen is loaded with spermatozoa. In the first class, ignorance of their real condition is bliss; while in the second, the certain knowledge of their infirmity produces the greatest misery.

The seminal fluid may be destitute of spermatozoa in consequence of an obstruction of the excretory ducts of the testes. This is the result usually of acute inflammation of these organs. Gonorrhoea has been regarded

as a disease of no very serious importance; but when we see it often producing a double orchitis, which may leave the subject of it sterile for ever afterwards, we should look upon it rather as an affection likely to be attended with the most disastrous consequences.

I now call to mind three young men whom I treated for double orchitis, following gonorrhœal inflammation, about twenty-five years ago, which left in each a chronic double epididymitis. They have been married many years without issue. It is true their wives may have been sterile. On this point I cannot do better than to quote from Mr. Curling,* who says:—

“In 1853, M. Gosselin made known some curious researches in relation to this subject. He carefully examined the semen in twenty men who had been attacked with double epididymitis after gonorrhœa. In fifteen of these cases which were comparatively recent, a callosity existed in the tail of the epididymis at the time they seemed to be cured. In all, the genital functions appeared fully restored and the sperm normal. The semen was repeatedly examined at intervals of several weeks, but no spermatozoa were detected. M. Gosselin lost sight of all but two cases, and in these the return of spermatozoa in the semen occurred after some months, and coincidently with the complete disappearance of the induration in the epididymis on one side. In the remaining five of the twenty cases the double epididymitis had occurred several years previously. One man, aged forty-five, had been attacked twenty years before, but the left callosity no longer existed, and spermatozoa were found in the semen. In another man the disease dated back five years, and had left a

* *Loc. cit.*

considerable induration at the lower part of each epididymis. The general health was good. No spermatozoa could be detected. In the three other cases the disease had occurred ten, six, and four years before. There was hardness on both sides. The testicles were otherwise unaltered. The indications of virility were quite satisfactory, and the semen presented its usual appearance. The individuals had all been married several years, but had no children. The sperm was carefully examined and found destitute of spermatozoa. One of them had had children by a former wife before the attack of double epididymitis. Since the publication of the preceding observations, M. Gosselin has met with two cases of men who, after suffering from bilateral epididymitis during their youth, had retained an induration on each side. They had been married several years and had no children. In both the virile powers were not, apparently, weak, but the sperm was entirely wanting in spermatozoa.

Thus it will be seen that inflammation of the testes is a matter of grave importance. And this is so whether it be the result of specific causes, of accident, of cold, or of translated parotitis. I have known one case of epididymitis from mumps, where the testes lost the power of generating spermatozoa. It is a curious and fortunate circumstance that epididymitis, by whatever cause produced, in no way weakens the sexual appetite, or the power of gratifying it.

Semen destitute of spermatozoa has the usual *sui generis* odour, but lacks the appearance of uniformity that belongs to the normal secretion. When viewed by a transmitted light, we usually see little whitish flakes of mucus floating through it. But I have seen two instances in which it had the colour and appearance

of good semen, although wanting spermatozoa. It is insoluble in hot or cold water, and floats about in it immiscibly in cloudy flakes like ordinary mucus. It is more translucent than good semen, less milky, and less opaque. Under the microscope it presents the appearance of ordinary mucus. I have seen samples of semen full of spermatozoa, but loaded with mucus, which probably came from the glandular apparatus at the neck of the bladder. I know of one case illustrating the fact that a man is not necessarily sterile because his semen possesses too large a proportion of mucosity.

Normal semen will drop from the end of the syringe in drops as easily as water. A small quantity falling into a glass of water is, by slight agitation, immediately diffused or dissolved in it. Abnormal semen full of mucus will not leave the mouth of the syringe quickly or suddenly, but ropes off for an inch or more before it breaks into a drop; and when it falls into water it preserves its tenacity, and but a small part of it is dissolved. It floats about in shreds, and eventually settles at the bottom of the glass in the form of a whitish sediment.

Sometimes sterility in the male depends upon a stricture obstructing the outward passage of the semen, which consequently in the act of copulation regurgitates into the bladder. This condition of things is, of course, curable by the proper treatment for stricture.

At the beginning of this section I said that, to ensure conception, "semen with living spermatozoa should be deposited in the vagina at the proper time."

It is the vulgar opinion, and the opinion of many savants, that, to ensure conception, sexual intercourse should be performed with a certain degree of complete-

ness, that would give an exhaustive satisfaction to both parties at the same moment. Even Roubaud* has devoted many pages to the consideration of frigidity in the woman. How often do we hear husbands complain of coldness on the part of wives; and attribute to this the failure to procreate. And sometimes wives are disposed to think, though they never complain, that the fault lies with the hasty ejaculation of the husband. Both are wrong.

God has given us appetites and desires, and endowed the act of copulation with a pleasurable erethism, simply that we might be forced to "multiply and replenish." But for this, the human family might, long ago, have been numbered with the fossils that represent extinct species. No; it matters not how awkwardly and unsatisfactorily the act of coition may be performed, so that semen with the proper fructifying principle be placed in the vagina at the right moment; and, on the contrary, it matters not how perfectly and satisfactorily it may be done, if the semen lacks this fecundating power. I have known many men who knew but little of mere animal sensuality, and whose wives knew less, and yet they were blessed with large families; and, on the contrary, I have known some who were differently constituted, and yet they were perfectly sterile.

It might be thought that I am here overstepping the bounds of propriety, even in a work purely surgical; but I justify myself by the fact, that a false philosophy has gained almost universal credence; and that young medical men, with a correct knowledge of facts as

* "Traité de l'Impuissance et de la Stérilité chez l'Homme et chez la Femme." Par le Dr. Félix Roubaud. Paris: J. B. Baillière 1865.

they truly exist, may do much to render many families happier, by setting them right on a point of more vital importance to domestic happiness than many of us have ever dreamed of.

Let us turn to pages 331 and 332, and read over the cases in which conception took place while the wives were etherized, and ask ourselves what agency mere sensual enjoyment could have had in bringing about the result. Our literature furnishes many cases where the seminal fluid has been lost at the mouth of the vagina; where the hymen has remained intact; and where, nevertheless, conception readily occurred.

I have seen cases of this sort; so has Sir Joseph Olliffe; and so has Dr. Campbell, of Paris. Most of these were cases of vaginismus, where the pain and spasm of the sphincter vaginae were such as to preclude penetration, and the semen was lost at the ostium vaginae, a little passing through the hymen.

M. Tardieu,* Dean of the Faculty of Paris, relates a remarkable instance of conception following lascivious titillations under most unnatural and unfortunate circumstances. Here the semen was habitually lost at the ostium vaginae, with the belief that conception could not occur unless the act of coition was fully consummated. But the sequence proved otherwise; and M. Legrand, who delivered her, found the young girl's vagina virginal.

I once requested the husband of a lady who had vaginismus, to let me see his wife an hour after sexual intercourse, for the purpose of determining whether any semen ever entered the vagina. He had not attempted

* "Étude Médico-légale sur les Attentats aux Mœurs." Par Ambroise Tardieu, Professeur, &c. Paris: J. B. Baillière et Fils, 1859, page 99.

it for ten days or more, and he said he was so nervous at the idea that he lost the semen at the moment of contact, and hence the effort amounted to nothing.

In consequence of this accident, I did not see the patient at the appointed time; but visited her a few hours later for some other purpose, and removed about ten drops of clear translucent mucus from the canal of the cervix. The attempt at copulation was made at eight a.m., the patient did not rise from bed till eleven. At twelve I saw her, and then removed the cervical mucus. I intended to make a microscopic examination of it at once, but circumstances put it out of my power, and I did not do this till midnight, being twelve hours after its removal, and sixteen hours after the attempt at intercourse.

In this cervical mucus I found a solitary spermatozoon, which manifested the greatest activity. I examined the whole of the ten drops of mucus, but could not discover another one, nor was there any in the vaginal mucus. How did only one spermatozoon and no more find its way into the canal of the cervix? Perhaps not more than a drop, or half a drop, of semen passed through the little hymeneal opening. The patient lay in bed three hours afterwards. During this time this stray spermatozoon had travelled three inches and a half from the hymen to the os tincae (for the vagina was very long and narrow), and had entered into the canal of the cervix, while the remainder of the seminal fluid passed off in resuming the erect posture. The case is curious, as showing—

1st. That semen can be thrown into the vagina without penetration.

2nd. That a spermatozoon can, in a comparatively short time, move over a considerable distance; and

3rd. That it can live a long time out of the body, provided the temperature is not too low. This observation was made on one of the hottest days in July.

We know very well that the semen, or rather its fructifying principle, the spermatozoa, must pass into the cavity of the uterus, if not further, to render conception possible. How is this done? Does it enter the canal of the cervix in the act of ejaculation? or do the spermatozoa afterwards, by their locomotive powers, gradually wend their way up the canal of the cervix?

I am not aware that any observations on the living subject have before been made upon this point. A few *post-mortem* examinations, made in cases of sudden death after coition, have demonstrated the presence of spermatozoa in the cavity of the uterus; but this does not settle the questions raised above. The fact that pregnancy has frequently occurred without penetration, proves very conclusively that the spermatozoa can and do traverse the whole length of the vagina; that they then can and do enter the canal of the cervix, and passing along this narrow strait, that they can and do pass on till they reach the ovum, and fertilize it. But this is not the usual way in which this is done.

I have over and over again examined the condition of the uterus after coition, and often in four or five minutes after it; and I have usually found the state of things described on page 348. I have also frequently removed the mucus of the cervical canal immediately after sexual intercourse, first a drop from the os tincæ, and then a drop or two from an inch higher. If the neck of the womb is in a normal condition, with an open os tincæ filled with healthy mucus, we shall always find spermatozoa in it, in greater or less numbers, if we examine it immediately after coition.

Thus we see that they enter the cervix, as it were, suddenly. My explanation of this physiological phenomenon is, that the cervix is pressed forcibly against the glans by a contraction of the superior constrictor vaginae; that this pressure necessarily forces out the contents of the canal of the cervix; that the parts subsequently become relaxed, the uterus returns suddenly to its normal condition, and the seminal fluid filling the vagina, necessarily rushes into the canal of the cervix by a process similar to that by which a fluid would pass into an India-rubber bottle slightly compressed, so as to expel a portion of its contents before placing its mouth in a fluid of any sort.

If the uterus is in a normal condition, we shall always, as a rule, find spermatozoa in the canal of the cervix immediately after coition. If the uterus is greatly retroverted, we shall not; and if it is greatly anteverted we shall not. And why? Because, in the first instance, the os tincæ will be too close to the symphysis pubis, and if it is subjected to any such pressure as that alluded to above, it will, for anatomical reasons, be such as to compress the posterior lip of the os tincæ up against the anterior, which will have no effect in exhausting the canal of the cervix; and in the second instance, where there is a complete anteversion, with the os looking in the direction of the hollow of the sacrum; the same act and the same pressure would only force the anterior lip of the os tincæ up against the posterior, creating no vacuum, and making no room for the newly introduced fluid.

From this it will be seen that I believe the cervix uteri to be shortened in the erethismal climax of coition, by pressure exerted upon it in the direction of its long axis when its position is normal, which is impossible in

any greatly abnormal position. I have spoken of a superior constrictor vaginae, and attributed to it a certain office—that of compressing the glans forcibly against the os tincæ at a certain moment. I have made no dissections to prove the existence of such a special muscle; but that it does exist, and that some anatomist will dissect and describe it, I feel perfectly confident, for I have seen the manifestations of its presence hundreds of times. In uterine examinations with the patient on the left side and my speculum introduced, we may now and then see the posterior wall of the vagina just opposite the os tincæ gradually contracted and corrugated, till it is brought almost in contact with the cervix, evidently by circular bands of muscular fibres that occupy the superior portion of the vagina.

We are more apt to see this in patients that are alarmed, and manifest some degree of general nervous agitation. I have witnessed this over and over again, and what one man sees another will be sure to discover when his attention is turned in the proper direction. It matters not whether this explanation is correct or not, provided other observers establish the fact that the semen finds its way at once into the canal of the cervix.

We have already discussed many of the mechanical obstructions that prevent the passage of the semen to the cavity of the uterus; and we have seen that the great difficulty is to be found almost uniformly in the cervix.

It has, hence, occurred to many philosophic minds, to overleap this barrier at once, by throwing the fructifying agent right into the cavity of the uterus. But the practical execution of this is surrounded by many difficulties. For instance, how delicate and difficult

would it be to arrange everything preparatory to such a procedure. Then, as to the temperature of instruments; for the slightest variations of this, whether of heat or cold, are inimical to the life of the spermatozoa. Then as to the quantity of semen to be introduced, whether much or little; the delicacy of the apparatus for this, and the proper time for the operation. When all these circumstances are taken into consideration, we can appreciate the difficulties of the practical execution of a thing that would at first appear to be theoretically so simple. Ever since the days of Spallanzani and Rossi, who, with a syringe, injected the semen of the dog into the vagina of the bitch, and saw impregnation follow, it has been supposed by many that in the human subject this mechanical process might be carried still further, by injecting the semen into the cavity of the uterus from the canal of the vagina. But I know of no published account of any experiments of this sort.

Some years ago, I made a series of this kind, and actually saw conception follow this process in one instance. Dr. George Harley, Professor, &c., in University College, London, informs me that he has repeatedly performed the experiment of injecting the semen into the cavity of the uterus, but with no result. I have given up the practice altogether, and do not expect to return to it again; but as others may feel disposed to try further experiments in this direction, I shall here give them the advantage of my experience.

Before undertaking this we must satisfy ourselves that the semen is perfectly normal, and that it does not and cannot enter the canal of the cervix in the natural way.

In all my cases there was a contraction of the canal

of the cervix, and in two there was quite a flexure at the os internum; and experimental observations proved that the semen never entered the canal of the cervix in any one of them. In all of them the operation of incising the os and cervix would have been the proper course to pursue; but my patients were too timid, would not submit to it, and accepted the uncertain alternative of uterine injection. In my first experiments this was often more painful than any operation, for it frequently produced severe uterine colic. I had no data to guide me, and I began by slowly injecting three or four drops of the seminal fluid, which produced very severe symptoms; then two drops, and then one, till finally I determined that half a drop was quite enough. Indeed, I have no idea that this quantity ever gets into the cavity of the uterus in Nature's own way, and I now wonder why I should have begun these experiments in such a heroic manner. Suffice it to say that I have seen conception follow this artificial fructification once, and once only. The case is of sufficient importance to give it in detail.

My patient was twenty-eight years old; had been married nine years without issue; and had had more or less dysmenorrhœa all her menstrual life. It was often attended with great constitutional disturbance, such as nausea, vomiting, and sick headache. She had retroversion, with hypertrophy of the posterior wall, an indurated conical cervix, a contracted canal, which was particularly contracted at the os internum, in consequence of the flexure incidental to the malposition; and superadded to all these mechanical obstructions, the vagina never retained the semen. I examined this case several times very soon after sexual intercourse, and I never found a drop of semen in the

vagina, although it was placed there in the greatest abundance.

This patient was willing to submit to anything but a surgical operation. Could any case have presented a greater number of difficulties to be overcome? The first thing to be done was, of course, to rectify the malposition, and to keep the uterus in its normal relations by means of a properly adjusted pessary, with the hope that the vagina would retain the semen. This point has been so fully discussed in Section V., that it is unnecessary to say more here than that I fortunately succeeded in doing this, and a sufficient quantity of semen was retained, though the most of it passed off. This part satisfactorily arranged, we were now ready for the uterine injections. These extended over a period of nearly twelve months. Some of them (two) were made just before menstruation; the others (eight) were made at different periods, varying from two to seven days after it ceased. Beginning with three drops, I at last injected half a drop.

Fig. 140 represents the instrument with which these experiments were conducted, with the exception of the bulb at the end of the tube. It is made of glass. The



Fig. 140.

piston can be drawn out easily for the purpose of taking up the semen; but for the purpose of graduating exactly the quantity to be injected, there was a little screw nut, *a*, which could be turned against the piston-rod, upon which a screw was cut. This prevented the piston from being forced down, except by the action of the screw. When we wished to force out the contents of the syringe, half a revolution of the piston forced out half a drop, a whole revolution a whole drop, and so on, just as does Pravaz's instrument for the endermic injection of morphine. The greatest care was necessary in managing the temperature of the syringe. I placed it in a bowl of warm water, with a thermometer to mark 98° Fah., taking care to have it no more and no less.

But as the removal of the instrument from the bowl of water to the vagina would be necessarily attended with a diminution of temperature, I adopted the plan of allowing it to remain about a minute in the vagina before drawing up any of the semen into it; and this for the purpose of insuring it to be the same temperature as the fluid in which the spermatozoa disported.



FIG. 141.

Fig. 141 represents the exact size of the glass-tube, used the last time in this case; *a* is the point at which a string was tied, as a guide and a guard to prevent its being introduced too far into the cavity of the uterus. This was exactly one inch and nine-sixteenths from the end, which I think is quite as far as we should introduce the instrument. Thus it was not carried so far as to injure the lining membrane of the

uterus, or to mar the vitality of the ovum, if it had already reached this cavity. I feared that I might have done one or both of these in some of my earlier experiments. In this particular case, about four drops of semen were taken up; the instrument was cautiously carried into the canal of the cervix, till the point was in close contact with the os tinæ; then the piston-rod was slowly turned half a revolution, which as slowly forced out half a drop of semen; the instrument was held *in situ* for ten or fifteen seconds and then withdrawn, and the patient lay quietly in bed for two or three hours afterwards.

Under these circumstances, at this, the tenth trial, conception took place, and everything went on favourably till the fourth month, when a fall and a fright unfortunately produced a miscarriage, from which the mother recovered with the greatest difficulty. I have related this case minutely, because I presume it is the first and only authentic case in which artificial fertilization has been successful in the human species; and because it furnishes about the sum and substance of my knowledge on the subject which may be of any possible service as a guide to future observers, who may have the curiosity, leisure, courage, and perseverance to experiment further in this direction.

The experiments above alluded to were made on half a dozen different patients. During the two years that I was engaged in them, I made fifty-five uterine injections. I think I am entitled to subtract about half the number as having been badly done, or having been made with badly constructed instruments, or under injudicious circumstances. If so, then they show one conception out of about twenty-seven trials. I have very little doubt that we shall learn still more about embryology;

and some years hence, when we shall better understand the laws of conception, I doubt as little that some one will be able to apply the principles sought to be established by these experiments with more exactitude than I have. If we understood more about the proper period for conception, this mechanical fertilization might become exact enough to depend upon it in such cases as would be otherwise impracticable.

Science, even in our own day, demonstrates now and then the wisdom of laws given under the Mosaic dispensation. As an instance, I have only to refer to the recent discovery of *Trichinæ* in swine, as showing not only its occasional unfitness, but its positively poisonous qualities as an article of diet under some circumstances. Then, again, the laws bearing on the uncleanness and the purification of women in menstruation, are in accordance with the accepted doctrines of the day, in regard to the period of fitness for conception. "But if she be cleansed of her issue, then she shall number to herself seven days, and after that she shall be clean."—Levit. xv. 28.

It is pretty well established that menstruation is the sign of ovulation; that it is preparatory to the reception of the ovum; that the ovum reaches the cavity of the uterus in from two to ten days after menstruation; and that it must be fertilized at some point between the ovary and the os internum, by coming in contact with the spermatozoa. Dr. Ritchie* of Glasgow believes, with many other modern Physiologists, that the uterus itself is the normal seat of conception.

* "Contributions to Assist the Study of Ovarian Physiology and Pathology." By Charles G. Ritchie, M.D., &c., &c., p. 101. John Churchill & Sons. 1865.

Now, if all this be so, it follows that the best time to insure this fructification is within the ten days following menstruation. This is the generally accepted doctrine in regard to the most fitting time for conception. I have no doubt that conception may take place at any period whatever, relatively to the return of menstruation; but there is hardly a question that it occurs more frequently within the ten days following this period. I know of several instances in which it undoubtedly occurred within the week preceding the expected return of the flow.

Sir Joseph Olliffe and I sent a patient of ours to Spain, in the spring of 1864. She had been under treatment for menorrhagia for three or four months, and lived entirely apart from her husband during the whole of this time. They were ordered to live apart till she should pass over one period in Spain. Everything went on according to our prescription till about forty-eight hours before the expected appearance of the flow, when by accident, as sometimes happens, the injunction of the doctors was momentarily forgotten, and the period did not come at the expected time. Indeed, she conceived, and in due time was delivered of a daughter.

The husband of a lady of great eminence, aged thirty, the mother of three sons, the youngest three years old, was absent in the Holy Land for five months, and returned exactly five days before the expected recurrence of his wife's menses. He spent but one night at home, being suddenly called off for several days by some urgent business. His wife conceived, and bore him a daughter.

I had a lady, aged twenty-eight, nearly two months under treatment for some cervical disease. The case was treated entirely with tampons of cotton-wool, wet

with glycerine, holding in solution various remedies, such as tannin. When she was thought to be well enough to return home, her husband came for her. I wished to see if the secretions were normal. Sexual intercourse took place, at my request, two days before the expected return of menstruation. It did not appear. She had conceived, and in due time a son was born.

I can vouch for the reliability of the parties alluded to above. I have related these three cases to illustrate the fact, that conception can and does take place just on the eve of the approach of menstruation; a thing, by the bye, that is not denied. I could give several reliable cases where the circumstances were such as to prove that conception could only have occurred within a week or ten days following the cessation of the flow.

When I was engaged in the philosophic experiments of artificially introducing the semen into the cavity of the womb, I had to make some fifteen or twenty essays before I was satisfied of the quantity of semen to be introduced, but as to the proper time for this I never felt entirely sure. For those who are very anxious for offspring, I usually order sexual intercourse on the third, fifth, and seventh days after the flow has ceased; and on the fifth and third before its expected return; and but once on each day. For the most obvious reasons this should always be on going to bed at night, instead of just before rising in the morning. The horizontal posture favours the retention of the semen; the erect its expulsion. I am satisfied that too frequent sexual indulgence is fraught with mischief to both parties. It weakens the semen. In other words, this is not so rich in spermatozoa after too great indulgence; and when carried to the extent of a debauch, the fluid ejected may be wholly destitute of spermatozoa. Thus it will be

seen that it is much better to husband the resources of both man and wife. The sexual act should never be done except at the spontaneous prompting of nature. It is very curious to contemplate the bounties of nature when we come to view the provisions made for fructification, whether in the vegetable or animal kingdom. We know that but little semen and but few spermatozoa are needed for fertilizing the ovum. We see this in pisciculture, and we may infer it in all creation. I do not know that any one has ever thought of measuring the quantity of semen ejected in the act of copulation, nor do I know that it would be possible to arrive at this point accurately; but accident led me to make some observations on this subject, which I here place on record as a matter of physiological interest, if not of therapeutical importance.

In most women a considerable part of the semen passes off with the completion of the copulative act, and the separation of the sexes, while a large part of it remains in the vagina to gradually ooze away. It has so happened that I had two patients whose vaginas seemed to hold almost all that they received. It has been my duty to examine them a few minutes after coition, and the perineum and nates appeared to be almost as dry as if nothing of the kind had taken place. The quantity of semen retained by the vagina seemed to me to be so great, that I was induced on several occasions to remove it with a syringe, and to measure it subsequently, and I found that ordinarily there was about a drachm and ten minims. Of course, this did not comprise all that was deposited there, for a very considerable portion must of necessity always be removed by the male, merely by the attraction of cohesion.

It would be important to determine how long sper-

matozoa can live in the matrix. On this point we need more extended experiments, for I do not think that their duration of life has yet been fully established. Dr. S. R. Percy,* of New York, reports a case in which he found "living spermatozoa, and many dead ones," issuing from the os uteri, eight and a half days after the last sexual connection. During this time the husband of the patient had been from home.

I have examined the semen many times with the view of determining this point, and think I can safely say that spermatozoa never live more than twelve hours in the vaginal mucus. But in the mucus of the cervix they live much longer. At the end of twelve hours, while all are dead in the vagina, there are but few dead ones to be found in the cervix. When the cervical mucus is examined from thirty-six to forty hours after coition, we shall ordinarily find as many spermatozoa dead as alive. But my observations on this point could not, under the nature of things, be accepted as the rule, for they were all made upon those who were, or had been, the subjects of uterine disease in some form or other.

Here is the report of an observation made upon a patient who is perfectly reliable:—"Sexual intercourse at eleven p.m. on Saturday. A microscopic examination of the secretions was made on Monday, at three p.m., just forty hours afterwards. The vaginal mucus contained a few dead spermatozoa—none alive; the cervical mucus contained great numbers very active—a few dead."

The above is copied from notes made at the time. I saw no reason why many of these active spermatozoa should not have lived for a still longer time. Many of

* *American Medical Times*, March 9th, 1861.

them lived six hours after their removal. This was in July.

Before closing this subject, I shall give a few examples illustrating the best time for sexual congress after menstruation, to insure conception.

A menstruation took place on the 7th and ended on the 10th of the month. Sexual intercourse happened once on the 11th. On the morning of the 12th, the lady went to a sea-side watering-place, where she remained more than a month, leaving her husband at home. She had always been regular, but her period did not appear on the 5th of the following month as she expected. Fearing that the sea-bathing had something to do with the non-appearance of the menses, she sent for a physician, who ordered her to stop the baths, and gave her some strong emmenagogues to provoke the flow, but it did not come. The next period passed, and it was found, greatly to her surprise, that she was pregnant. She went the full time, and a son was born.

I operated on a lady, thirty years old, who had been married fifteen years without offspring. I directed her to have sexual intercourse on the third, fifth, and seventh days after the cessation of the menses. She menstruated on the 8th of the month, ceased on the 12th, had sexual intercourse on the 17th, and a son was born on the 16th nine months afterwards.

In the case of uterine injection spoken of on page 368, menstruation began on the 2d of the month, finished on the 6th, sexual intercourse took place on the 12th, the uterine injection was only five or six minutes afterwards, and conception dated from that time.

Here, then, is one case where conception occurred on the day after the flow ceased, and only four days from the time it began; another in which it probably took

place five days after the flow ceased, and nine days from the time it began; and another in which it took place six days after the flow ceased, and ten days after it began. I might give other facts like the last two, but I forbear. They accord very well with the received doctrines of the day as to the proper time for conception, viz., about a week, more or less, after the cessation of the flow.

I hope I have said enough to show that, for the purpose of conception, "semen with living spermatozoa should be deposited in the vagina at the proper time."

SECTION VIII.

THE SECRETIONS OF THE CERVIX AND VAGINA
SHOULD NOT POISON OR KILL THE
SPERMATOZOA.