

too young. It may also be experienced by women who marry late in life. After the climacteric, especially in women who have not been accustomed to sexual relations, the uterus, vagina, and vulva undergo a kind of atrophic involution, in the course of which the vagina and vulva lose much of their glandular structure, and the tissues lose elasticity and distensibility. Sexual relations under these circumstances may be not only painful but even dangerous. There is a preparation in St. George's Museum of a vagina ruptured through the roof by the sexual act.

The condition called *coccygodynia* by Sir J. Simpson may also be a cause of dyspareunia.

It must be remembered that dyspareunia in women may in many cases be traced to the other sex. Imperfect, awkward intercourse induces a chronic, nervous irritability, which in turn renders approach intolerable. This is a not infrequent source of distress in couples ill-matched as to age and physical strength and disposition.

I think it important to insist that whenever a discharge of blood follows sexual intercourse, whether it be accompanied by pain or not, a local examination should be instituted. Bleeding excited in this manner is often the first indication obtained of the existence of organic disease of the uterus and vagina; and it is superfluous to say that the prospect of curing organic disease will in many cases depend greatly upon seizing the earliest indications.

THE SIGNIFICANCE OF STERILITY.

The discussion of the significance of sterility naturally follows upon that of the significance of dyspareunia. It may be stated, as an obvious general proposition, that dyspareunia entails sterility. Of course there are many exceptions; for although intercourse may be difficult and painful, still it may be accomplished; and numerous cases prove that complete intercourse is not necessary to impregnation. But these exceptions do not invalidate the general law that dyspareunia is an obstacle to fertility. This is further proved by the frequent occurrence of pregnancy when dyspareunia is cured. It is not simply because dyspareunia so frequently involves the suspension or incomplete performance of the sexual act that it entails sterility. Various conditions, as inflammation, displacement, which produce dyspareunia, are also often of themselves obstacles to impregnation. This is proved by the fact that in numerous instances these conditions entail sterility, although sterility is not complained of.

It is no part of the object of an essentially clinical work to dwell upon the moral or social aspects of this question. But it is strictly within the scope of medical discussion to observe that sterility is not a purely negative evil, that is, the history of sterility is not summed up by saying that it is simply the negation of fertility. Complete sexual life in woman implies the due succession of the functions of ovulation, of gestation, and of lactation. The ovaries, the uterus, and the breasts ought in the natural cycle or order to relieve each other. Where the ovaries alone act continuously under the excitation of married life, a sense of an unfulfilled function arises which in many organizations is likely to induce physical as well as mental disturbance. The familiar saying that women in

a certain condition of health would be well if they could have children is a popular mode of expressing this physiological fact.

Referring to the evils attending sterile marriage, Dr. West observes that chronic ovarian irritation and chronic congestion of the womb leading to hypertrophy and menorrhagia are apt to ensue. This is undoubtedly true; but I may remark that these cases would be less frequent, if the necessity of dilating the narrow os externum uteri were more generally recognized. When this is done, even although pregnancy do not follow, the injurious local affections are much less liable to arise. The significance of sterility, from a medical point of view, then, may be taken generally to be painful or imperfect sexual relations, some disease of the vulva, vagina, uterus, or ovaries, or disability on the part of the husband. Sterility is itself a symptom or condition that may call for medical investigation and treatment, apart from the pain or other symptoms which take their rise in concomitant diseases.

In discussing the subject it is necessary to bear in mind the distinction between sterility in a woman from conditions inherent in herself, and sterility with potential fertility. It would be convenient if we could differentiate these cases by the appropriation to each of definite terms. Thus we might say a woman was "sterile" whose inherent conditions precluded her from conceiving, and we might say a woman was "barren" who was in every respect apt to conceive, but who remained childless, because, first, the fertilizing element was wanting; or, secondly, because if she conceived, the ovum did not come to maturity. We should fall into grievous error, however, if we were to conclude that sterility always implied an abnormal condition of the sexual organs in either the man or the woman. Numerous instances prove that sterility may be relative only. Certain degrees of affinity seem to be unfavorable to fertility. Upon this subject Francis Galton has adduced many most interesting and valuable historical and statistical illustrations. Thus, he shows in his book on *Hereditary Genius* how evil is the influence of consanguineous marriages.

Mr. Galton also shows the bad influence of marriage with "heiresses." Heiresses are presumptively single children, the feeble fruit of worn-out stock. Many peerages have become extinct through this. One-fifth of the heiresses have no male children at all, a full third have not more than one child, three-fifths have not more than two. It has been the salvation of many families that the husband outlived the heiress whom he first married, and was able to have issue by a second wife. "I look," says Galton, "upon the peerage as a disastrous institution, owing to its destructive effects upon our valuable races."

The researches of Galton are confirmed by those of Sir J. Simpson on the fertility of the peerage. Thus Sir James found that out of 495 marriages in the British peerage 81 were without issue, giving 1 in 6.11 as the proportion of sterile marriages; whilst 675 marriages in the villages of Grangemouth and Bathgate, one being agricultural the other seafaring, gave 65 sterile, or about 1 in 10.

The available materials for estimating the proportion of sterile women are very scanty, so much so that no precise deductions can safely be drawn from them. Indeed, here, as in so many other cases where the phe-

nomena of life are concerned, the complicating conditions, and therefore the sources of fallacy, are so numerous that it is almost impossible to isolate the bare fact of sterility, the word being taken to imply incapacity, absolute or temporary, to bear children to any considerable number of instances, so as to make up a statistical column, all the constituent elements of which shall have equal value. Under the usual statistical process there remains nothing but a *caput mortuum*, from which all the facts, all the truth, have been sublimed away.

As a matter of general political interest, however, it may be stated that Dr. Farr calculates the mean fruitfulness of marriages in England in ordinary periods to be in every 100 marriages 420 children, giving an average of $4\frac{2}{10}$ children to every marriage. The subject is pursued in many of its bearings in Dr. Matthews Duncan's work on *Fecundity, Fertility, and Sterility*.

All speculations and calculations of this kind are obviously of little use in elucidating medical problems. The practical physician deals with the concrete, he has to study the individual case that comes before him; to search out the conditions associated with the particular disorder for which relief is sought; to endeavor to estimate the influence these conditions may exert upon the disorder; and by removing as far as he can all presumed interfering conditions, to enable nature to resume her course.

Applying this, the clinical method, we find that sterility in woman may be either *congenital* or *acquired*; it may be absolute and incurable, or relative and temporary. The cases may be ranged under the following heads:—

1. Those in which ovulation does not take place; or, if taking place, the escape of the ovule from the ovary is prevented. The ovary may be absent, in which case there will probably be absence or imperfect development of the uterus also. The ovary may be diseased, so that the Graafian follicles, *quod* their proper structure, may be destroyed. The ovaries may be covered with false membranes, forming an investment through which the ova cannot penetrate. There may be a general or local failure of nutrition arresting the maturation of ova. In such cases menstruation is generally absent. This condition may be temporary; indeed, it is often cured by appropriate constitutional treatment. It is exceptional for women who do not menstruate to conceive. But Bischoff relates a case which appears to show that an ovum may ripen, the menstrual flow occur, and sterility ensue, because the follicle does not burst. The ovum may decay in the Graafian sac. A not uncommon result of protracted difficulty of ovulation is gradual atrophy of the ovary, and hence entailed sterility. This fact is an illustration of the general law, that if an organ is long left idle it is apt to degenerate in structure, and to lose its functional capacity. Scanzoni further suggests that a diseased ovary may produce diseased ova.

2. Those in which the ovum may mature and escape from the ovary, but in which its due progress along the Fallopian tube and into the uterus is prevented. This is the case when the Fallopian tubes are absent, twisted, or severed; occluded by strictures, or false membranes; where the fimbriæ are absent (Baillie); where there is multiplication of the abdominal orifices, and pavilions (Richard); where the fimbriæ are

bound down to neighboring structures, so that they cannot be brought into apposition with the ovary. This was described by Ruysch. The uterus itself may be absent, or, as Courty calls to mind, may have no cavity. Fibrous tumors growing at the uterine orifices of the tubes, blocking them up, or in the walls of the uterus, especially of its lower segment and neck, by compressing and distorting the canal, may cause sterility. Indeed, when fibroid tumors exist, impregnation is comparatively rare.

3. Those in which obstruction is interposed to the meeting of the spermatozoa and ovum. This order necessarily includes the preceding cases; for the obstruction which arrests the progress of the ovum will equally arrest that of the spermatozoa in the opposite direction. But to the causes which arrest the ovum must be added those which block out the spermatozoa, as atresia, congenital or cicatricial, of the os uteri, vagina, and vulva; those which produce closure or deviation of the uterine canal, as excessive involution or atrophy, tumors, polypus, versions, flexions; certain peculiar formations of the uterus, especially of its vaginal portion, as a narrow os externum, excessive hypertrophic elongation of the vaginal portion, whether original or acquired, offers a decided obstacle to impregnation. It is a not uncommon cause of dyspareunia. For this double reason I have amputated the part with success; tolerance of the sexual function, impregnation, and natural labor ensuing. Dupuytren, Huguier, and others have related cases in point, and Scanzoni relates one in which impregnation followed six weeks after amputation of the hypertrophied posterior lip.

Excessive development of the labia vulvæ may prove an obstacle to intercourse. In such a case resection is indicated, and may be safely performed.

Some cases of double uterus and vagina, as the following: Dr. Laaser describes¹ the case of a lady who had been married several years without pregnancy. On examination it was found that the finger entered easily into a capacious vagina of normal length, which ended above in a nearly blind sac. There was only a rudiment of a vaginal portion without os uteri; but there was a longitudinal septum forming a smaller vagina, which latter was surmounted by a portio-vaginalis and os uteri. It was presumed that the uterus was also double. The sterility was accounted for by the blind vagina only being used, the vagina connected with the normal cervix being pushed aside. The septum was slit, so as to throw the two vaginae into one.

4. Those in which there is some imperfection in the performance of the sexual act. If Velpeau and Rainey be right in their view of the use of the round ligaments in drawing forward the fundus of the uterus, so as to throw back the os uteri into direct relation with the penis during ejaculation, and if this relation is as a rule necessary for impregnation, the reason why women who are the subjects of flexions, displacements, and disease of the uterus are so commonly sterile, is partly explained. This relation is absent in many cases where the vagina is unduly short, where the uterus seems set too low down in the pelvis, and where—under

¹ Monatschrift für Geburtskunde, 1864.

the effect of intercourse—the vagina is gradually lengthened by stretching into a pouch extending considerably above and behind the os uteri. In many cases it is not simply the flexion which prevents impregnation by distorting the uterine canal and throwing the os uteri out of relation, but the secondary accidents, as inflammation or congestion, attended by unhealthy secretions, which act adversely. It is, of course, necessary that the seminal fluid should be retained. But there are cases, including many in which the vagina being too short, shallow, and irritable, it is forcibly expelled by spasmodic contraction. It has been said that spasmodic stricture of the os internum may cause sterility; but the reality of this condition is not easy to prove. I have also known cases of extreme gaping of the vulva, from laceration of the perineum, in which impregnation did not take place until the normal condition was restored by operation.

5. Those in which unhealthy secretions are formed, unfitted for the maintenance of the vitality of the ovum and spermatozoa. Donné observed that some kinds of vaginal secretion instantly killed the spermatozoa. The qualities shown to be uncongenial are excessive alkalinity of the cervical mucus, excessive acidity of the vaginal mucus, the mucus of uterine catarrh, and other abnormal secretions; indeed, any secretion excessive in quantity amounting to leucorrhœa is also likely to have an unfavorable effect. Menorrhagia is often attended by sterility.

Sterility where a vesico-vaginal fistula exists is not, of course, a necessary result, but it is nevertheless frequent.

6. Those cases in which the mucous membrane of the uterus is unfitted to afford a nidus for the impregnated ovum. Thus there is a class of cases—and it is a large one—in which pregnancy fails, not because there is an obstacle to impregnation, but because the structures upon which the ovum should be grafted and supported are not in a condition to perform their part. In such an event the ovum, falling, as it were, upon bad soil, decays. The break-down occurs at variable periods. In many, probably, the ovum hardly gets any hold of the unhealthy mucous membrane or decidua. In many others, the mucous membrane undergoes the proper development for a stage, then breaks down. In many cases also there is little doubt that the ovum itself, although impregnated and engrafted on the decidua, perishes from inherent defect. We thus see how, by a large class of cases, sterility is brought into relation with abortion. It may seem paradoxical to say that many of the causes of sterility are also causes of abortion; but the proposition is, nevertheless, true. Some of the conditions above described, such as a minute os uteri externum and flexions of the uterus, do not oppose absolute obstruction to impregnation. But when this occurs, especially in the case of retroflexion, abortion is very apt to ensue. The same is true of hypertrophy, engorgement, ulceration, attended or not with displacement. In these conditions impregnation is not very rare, but the unhealthy state of the organ will be apt to lead to abortion. There is a kind of hyperplasia of the mucous membrane, sometimes depending upon a strumous, sometimes upon a syphilitic diathesis, which is very unfavorable to the support of the impregnated ovum. It is liable to undergo fatty degeneration, and to break down. Abortion is the result; and when this happens, as it

often does, repeatedly, other chronic changes, as hypertrophy, engorgement, are more and more likely to ensue, and to add new obstacles to impregnation and gestation.

Ovarian irritation is also likely to cause sterility and early abortion, especially when it leads to menorrhagia. Excessive and prolonged flow will so alter the mucous membrane that it becomes unfitted to form healthy decidua. And if impregnation have occurred, the ensuing menstrual nismus, too powerful to be controlled by the pregnancy, may be attended by a profuse hemorrhage which brings about extravasation into the decidua, or such other disturbances in the uterus as are incompatible with the maintenance of the ovum. In many cases of this class it is difficult or impossible to determine whether impregnation have taken place or not, that is, whether or not the case be one of early abortion. The practical result, however, is the same, and the indication for treatment is the same. Correct the unhealthy state of the uterine structures, allay the morbid irritability of the ovaries, and not only will impregnation be likely to occur, but the ovum may be supported and matured.

By far the most common associated conditions with sterility, in my experience, are congenital narrowing of the os externum and retroflexion of the uterus. These conditions are frequently combined. They are commonly attended by dysmenorrhœa; and dysmenorrhœa is often presumptive of sterility. The importance of this narrowing of the os externum uteri as an obstacle to impregnation is questioned by some physicians, and amongst others by Scanzoni. He urges that he has known impregnation take place where the os externum was no bigger than a millet-seed. Of this I too have seen examples, but I am satisfied from very extensive observation that these cases are quite exceptional. So preponderating is the association of a minute os externum and retroflexion, separately or combined, with sterility, that in any given case of a woman who remains sterile five years after marriage and suffers from dysmenorrhœa, it may be predicated with almost certainty that one or other, or both of these conditions exist. That these are efficient causes of sterility is further proved by the frequency with which pregnancy follows upon their removal. Of this I have seen many striking examples. Two sisters, both young, were referred to me by their brother, a former pupil. Both had always suffered from dysmenorrhœa, which had been increased by marriage, and both remained sterile after two to four years. In both I found exactly the same congenital formation, namely, retroflexion of the uterus and a minute os externum. In both I divided the os externum and corrected the retroflexion by the use of a Hodge-pessary. Both were relieved of the dysmenorrhœa, became pregnant, and bore children. This subject will be further discussed under the head of "Dysmenorrhœa."

Treatment.—Examining the foregoing summary of causes from a therapeutical or practical point of view, it will be seen that there is one order of cases in which the sterility is absolute from defect of structure or other conditions which cannot be removed, and which render impregnation impossible. The number of such cases is not great.

We see another order of cases in which there exists some mechanical obstacle, congenital or acquired, which may be removed by surgical

operation. The number of these cases met with in practice is considerable. Fecundity in these exists potentially. It is only necessary to remove the obstructions.

We see another order of cases in which actual proof of fecundity has been given by the birth of a child. With this one effort the capacity seems to be exhausted, at least for a time. This is "acquired sterility." This condition is in some cases due to excessive involution of the ovaries and uterus, which shrinking, appear to undergo premature senility. In other cases it is due to the flexions, hypertrophies, subacute inflammations attended by unhealthy secretions which sometimes follow labor. In these the sterility commonly ceases with the cure of the abnormal condition. In some, however, in which there has been pelvic peritonitis, the ovaries and tubes may have been involved in membranous adhesions which impede the escape of ova or their reception into the tubes. But it must not be supposed that pelvic peritonitis is a necessary cause of sterility. I have known many cases where there was no interruption to subsequent pregnancies. Peritonitis may cause temporary sterility by binding down the uterus in an unfavorable position, especially in retroversion. This will often admit of cure by wearing a suitable lever-pessary, which, constantly tending to lift up the fundus, puts the adhesions on the stretch, and gradually causes their removal by absorption.

The waters of Schwalbach and Kreuznach have acquired a reputation for the cure of sterility. It is true that a number of women have become pregnant after visiting these places; but I have good reason for saying that in some of them at least the happy result was not due to using the waters. Some had previously tried them in vain, and having subsequently been submitted to surgical treatment for the removal of physical impediment, had returned to Schwalbach or Kreuznach, and then conceived. In some cases, however, those for example which depend upon chronic engorgement or hyperplasia, with unhealthy secretions, the influence of change of air, repose, and the use of saline chalybeate and iodized waters in curing these conditions is decided; and these being cured, the attendant sterility will often disappear. With this qualification, I can speak well of Schwalbach, Kreuznach, and other places, but they do not deserve the blind faith which many patients and some physicians award to them. The rational course is to remove all the abnormal local conditions first, and then, but not till then, the patients may be sent to Schwalbach or other convenient place for time to do the rest.

The above-mentioned conditions account for a large proportion of the cases of sterility. All these conditions may, in the majority of instances, be remedied, and in all the prospect of impregnation is reasonable. That disappointment in this respect will occasionally follow, even when a detected associated morbid condition is removed, is no valid argument against treatment. It is sound practice to remove every abnormal condition we can. It is possible that any given abnormal condition which we discover, and which we know is in itself sufficient to entail a certain result, may be the only cause. It is of course possible that another cause lying beyond the first may coexist, and continue after the first is removed; but there is no harm done in removing the first. On the contrary, the first detected condition is often the cause of other evils beside

the particular one which it is our special object to cure; and it not infrequently happens that the removal of one condition opens the way to the discovery and cure of other conditions.

In short, the obvious principle of acting is to obtain as healthy a state as possible of the genital organs. The vulva, vagina, and uterus, and in some cases the Fallopian tubes, are within our range. When this portion has been brought into a satisfactory state, and when all morbid action of the ovaries has been subdued, we shall have overcome a very large proportion of the causes of sterility. The residuum will comprise those cases of obstruction from adhesions of the tubes and ovaries, of ovarian disease or defective development, which are mostly beyond the reach of successful treatment.

Sterility being, in so far as the fault lies in the woman, a consequence of some abnormal condition of the sexual organs, the treatment of it is involved in the treatment of these abnormal conditions. These cover a wide range of ovarian and uterine pathology, and form the subject-matter of this work.

Sensual gratification is not necessary to conception; neither does its absence preclude conception. The essential condition is that the fertilizing element should have ready entrance to the cervix uteri at the right time. Failure in this condition may result from a variety of causes in persons in whom no fault of structure in the ovaries or uterus can be found. Ovulation may be perfect, the Fallopian tubes and uterus may be healthy, the elements on both sides may be normal, and yet there may be persistent sterility. It is difficult to follow out this subject minutely. Some of the conditions referred to hardly fall within the scope of strictly medical discussion.

It is not, however, out of place to remember that the cause of sterility may reside in the man. It is customary to say that sterility in man is extremely rare. I am inclined to think otherwise. It does not fall within the design of this work to investigate the causes of sterility in the male sex. But I may refer to Mr. Curling's work on the *Diseases of the Testis* (3d edit.) for the best information on this subject. He confirms by precise observations the opinion expressed by John Hunter, "that when one or both testicles remain through life in the belly, they are exceedingly imperfect, and probably incapable of performing their natural functions." Thus, Mr. Curling shows that in cryptorchids the seminal fluid is commonly destitute of spermatozoa. In nine men this was ascertained to be the case, and their wives were barren. Several of these did not seem to be deficient in copulative power, and emissions occurred.

When, therefore, we find no marked abnormality in the wife, we must consider the possibility of defect in the husband; and it will be proper, before subjecting her to a distressing and perhaps painful course of treatment, to ascertain whether the fault is not on the other side.