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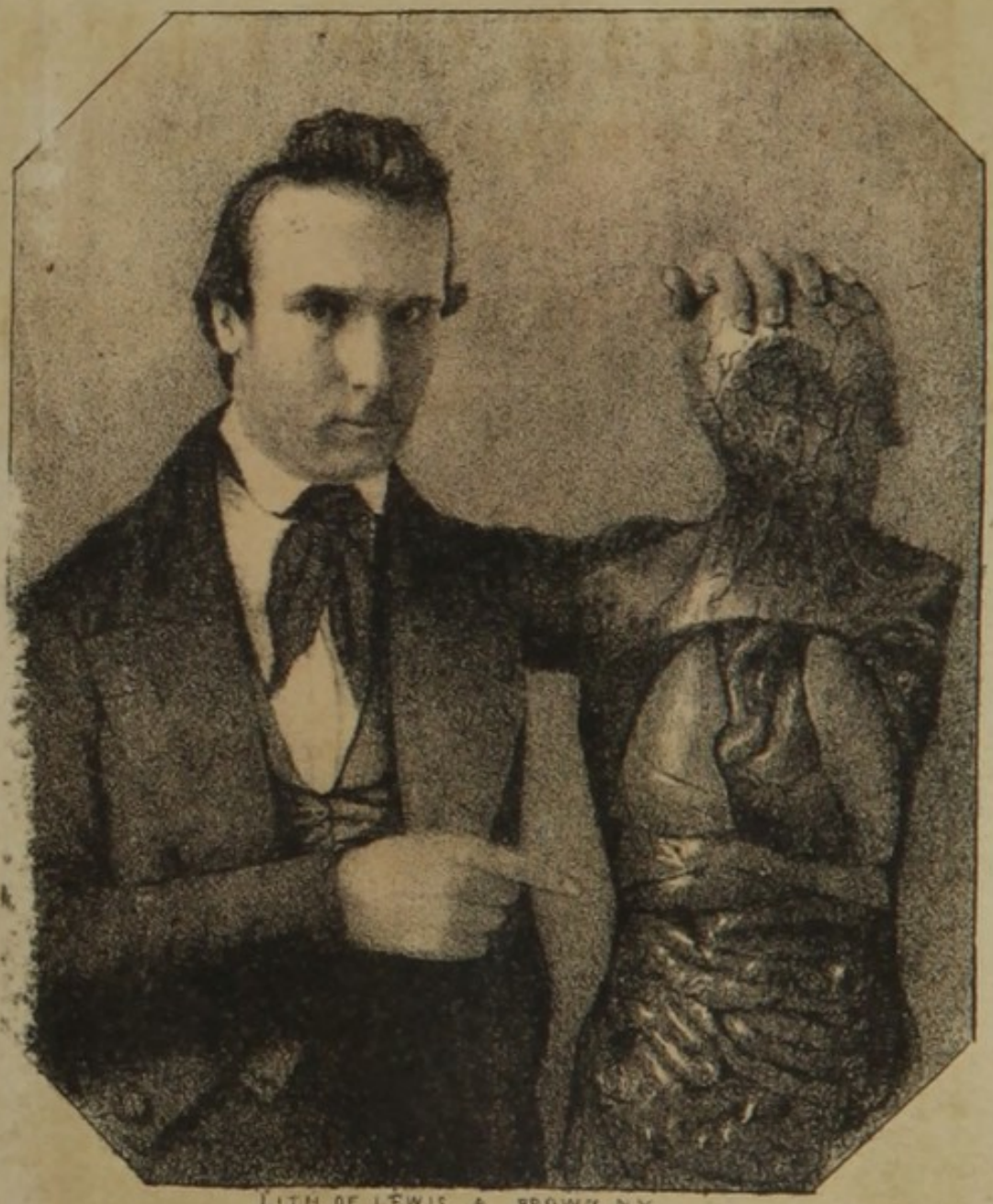

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F. Hollick. M.D.

F. HOLLICK, M.D.

THE

ORIGIN OF LIFE;

A POPULAR TREATISE

ON THE

PHILOSOPHY AND PHYSIOLOGY

OF

REPRODUCTION,

IN PLANTS AND ANIMALS,

INCLUDING

DETAILS OF HUMAN GENERATION,
A FULL DESCRIPTION OF THE
MALE AND FEMALE ORGANS.

Illustrated by ten fine colored engravings on stone.

BY
FREDERICK HOLLICK, M. D.
Lecturer on "The Origin of Life," "Female Diseases," &c.

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THE FRONTISPIECE.

This is a portrait of the Author, Lecturing with his large Figure. It is taken from a Daguerreotype by the celebrated Plumbe.

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PREFACE.

—

"To the pure all things are pure."

In presenting this book to the public, it is requisite that I should state why it was written, and what for. This is necessary, to prevent both misapprehension, and misrepresentation. For a work like the present, giving a *popular* view of a subject, hitherto known only to a few, can scarcely be expected, at first, to be received without suspicion, even if it escape condemnation without being read.

The majority of people have been made so irrational, and so immoral, in relation to these subjects, that they cannot conceive it possible for a person to be different from themselves. Directly a book of this kind is announced, it is at once assumed that it

is intended merely to gratify vulgar curiosity, or minister to a depraved taste. The good in consequence neglect it, and the bad seek it from an improper motive. I must, therefore, in the very commencement of my preface, state explicitly, that this work was not written with any ill intent, nor for any low or unworthy purpose; nor is it in any way adapted for gratifying, or pleasing, those whom a bad education has brutalised and depraved. It will not therefore give any offence to those who are truly moral and good, nor will it give any pleasure to those who unfortunately are otherwise.

The subject is one of universal importance; it concerns everybody, and all are interested in it, whether they will or not. It occupies the mind of nearly all persons, more perhaps than any other subject, no matter what may be the extent, or deficiency, of their information. The thoughts of the ignorant man are as full of it, as those of his more enlightened neighbour; probably much more so. Keeping persons in ignorance upon this subject therefore, does not prevent them thinking about it; but, by stimulating their curiosity, makes them think more, with the disadvantage of leading them to erroneous conclusions. There are few young persons but what experi-

ence the sexual feeling, it arises in them from the natural laws of their development, and no mystery, or seclusion can prevent it. It is useless therefore to attempt to conceal *the main fact;* this is taught in spite of every precaution. It is equally futile to think of preventing the mind from dwelling upon it, the tendency to do so is irresistible. We have therefore merely a choice, between giving correct information, and leaving the mind to be filled with error and vain surmise, for with one or the other it will most assuredly be occupied. I leave every person to decide between the two alternatives according to his own views. For my own part, I must see something more of the evil resulting from knowledge than I have done, before I fear it, and something more of the benefits of ignorance before I prefer it.

We are often told that the difference between man and the lower animals consists in this; that both feel the same instincts and propensities, but, in the brute they alone impel to action, while man has his reason to control or counteract them. Allowing this to be correct, it follows as a certain inference that, whenever man acts from his propensities alone he becomes a mere brute. Now what is the fact with

regard to the association of the sexes at the present time? What impels to it? Is it reason? Or does reason have anything to do with it? Very seldom; and from the simple fact that all attempts to reason about it are condemned! Every individual is told that it is immoral to seek for, or give, any information on the subject, and that he must not even *think* about it! The consequence is, that blind passion rules alone, reason, the characteristic of humanity, is dormant, and man becomes a mere brute, both in thought and action. Now my object is simply to give correct information, in a simple unobjectionable form, and so employ the reason; thus bringing it, into opposition to the mere animal propensity, which it is intended to control and regulate.

I cannot conceive that any person of ordinary capacity can condemn such a step, unless blinded by prejudice or interest. It is true there are persons who will do so; some from real ignorance, but more from an affectation of superior morality and delicacy, which they are very far from possessing. Such persons being naturally gross and indelicate, in their own thoughts and actions, conceive that others must be the same; and they think by condemning

every body else they shall make themselves appear immaculate; while the fact is, they exhibit their own sympathy with what is immoral and gross, by pretending to detect it where no one else thought of it, and where even it does not exist! Honest ignorance I can excuse, and think it my duty to enlighten; but prudery and hypocrisy, are too contemptible to be either respected or cared for.

I see no reason at all myself, why this subject should *not* be generally understood, but very many reasons why it *ought to be*. Correct information can do no one any harm, but may do many much good. It is undeniable that ignorance leads to many evils which knowledge would prevent. And we know very well from experience, that ignorant persons are not any less under the influence of their animal propensities than those who are enlightened, but, generally the contrary. The cultivation of the mind directly decreases the animal feeling, besides providing the only agent which can properly control it. If ignorance had any tendency to decrease vice, or produce virtue, we ought to find society in a most virtuous state at the present time, in its sexual relations; for it is buried in as gross ignorance as any could desire. But what

is the fact? Why palpably this, that we could scarcely imagine it to be more vicious! The fearful mass of vice and crime which is obvious to common observation, would be enough to condemn such a system; but that is only a small portion of the total amount. Every one who has had an opportunity of lifting the veil, and seeing something of the real condition of society, knows well that the hidden vices far outnumber those that come to light! The present condition of the world then, fully disproves the absurd supposition that ignorance either produces sexual virtue, or prevents sexual vice. And I go still further, for I assert that not only is ignorance incapable of preventing the vice, but that it produces it, both directly and indirectly! If this be so, and I think I can prove it in the course of this work, it follows that knowledge is the only agent which can eitheir remove the sexual evils now existing, or prevent them returning. At all events, as ignorance is proved to be *useless*, if not positively injurious, let us try what knowledge will do in its stead.

The common, puerile talk, about such things being immodest, or immoral, no matter how they may be represented, is scarcely deserving of notice. It originates

with those persons, before alluded to, who are themselves immodest, and who therefore view everything through an impure medium. Ignorance is in no way necessary, or conducive, to true modesty; and there is nothing more improper in understanding the phenomenon of reproduction, than in understanding that of digestion. We are alike interested in the well being of every part of our bodies, and every part therefore ought to be understood. What reason has there ever been, or can be brought forward, why those organs which reproduce our species, are not as fit, as interesting, and as useful objects of study as any others? There is no impefection in their organization, no gross failure in their action, and nothing repugnant, to a well regulated mind, in their proper exercise. On the contrary, there are no other parts of the system so admirably contrived, so beautifully perfect in their workings, or so intimately associated with our purest and least selfish emotions.

And if it be true, as some assert, and, as I think, truly, that contemplating the wondrous structure and perfect action of our bodily organs, is calculated to expand the mind, to cause reflexion, and so make us wiser, and consequently better, then I con-

tend that none are so well deserving of study as those of reproduction. Those persons not benefitted by that study must be incapable of improvement by any means, and already so depraved that nothing can make them worse.

It is true there are some unfortunate individuals, so brutalized by a bad education, that the mention of this subject excites debasing thoughts in them, for the simple reason that they are incapable of any other. It is no reason however, because these individuals are incapable of properly appreciating knowledge, that others should be deprived of it who can. The intelligent will be much improved by that knowledge; and the ignorant even may be so; at all events it can do them no harm, since it is only an exchange of correct information for absurd error.

This diffidence of knowledge, and preference of ignorance, is itself a result and a characteristic of ignorance. The time is fast coming when, so far from its being thought strange to understand the process of reproduction, it will be thought strange, or even criminal not to do so.

In former times every kind of knowledge was monopolized by a certain class of persons, and no one out of the pale of their

association was permitted to acquire it. And though public sentiment is fast abolishing this custom, it is still upheld to some extent. Our *learned professions*, as they are called, are remnants of this aristocratic institution, but they are fast losing their exclusive privileges, and being placed on the common ground of equal rights. The medical profession has long had an exclusive right to all knowledge of the human structure, its ailings, and treatments, and all attempts to disseminate such knowledge among the people has been bitterly opposed. It is now seen however that this monopoly is neither just, nor useful, but the contrary, and it is fast being abolished. The subject of this work particularly, was made such a perfect mystery to those out of the profession, that they ultimately believed they were neither capable of understanding it, nor had a right to do so. Persons may actually be found at the present day, not only content with their ignorance but fearful of having it removed, and angry with those who attempt to enlighten them. I am not desirous of interfering with such persons, doubtless ignorance is more congenial, and more suitable, for them, than knowledge, and they had therefore better remain as they are. There are others how-

ever who are not afraid of being made wiser, and it is to those I address myself.

There are some professional men even, either short sighted, selfish, or narrow minded, who are afraid of losing their influence, and consideration, if this mystery is exploded, and who therefore oppose all attempts like the present. But there are many others more just and generous, and more enlightened, who think and feel very different, and who will give me their cordial co-operation.

The fact is, this confining of knowledge in a barrier seriously hinders its extension; it is a relict of barbarism, productive of no kind of good, except to those who live on the ignorance of others; it is unjust, and utterly unworthy of the present age. All attempts to uphold such a system will be in vain; for the *democratic feeling* has entered the field of science, as it has that of politics and religion; and society will no more allow any class to possess all scientific information, than it will allow others to possess all political power, or religious rights. Universal equality, in the exercise, and use, of all our natural powers, is the rule of the day, and no one will be able to set it aside.

It is not intended by this, that every per-

son should become a professional man, but simply that every one has a right to be acquainted with these subjects, as far as he feels desirous. It may be merely to gratify a laudable curiosity, to expand his mind, to guard against imposition from his advisers, or to know how to conduct himself so as to prevent disease and suffering. No matter what the motive, the right is unquestionable.

The same narrow minded feeling, has made it unlawful, or improper, for females to aspire to the same degree of knowledge as males. And there are many men, sufficiently liberal to contend for *their own* right to known such things, who nevertheless deny the same right to women. This is preposterous, and tyranically unjust. It is assuming in fact, either that females are incapable of understanding, or unworthy of possessing such knowledge; both of which assumptions I deny. The present ignorance of women respecting their own structure, and the influence of external agents upon it, produces among them a most lamentable amount of disease and suffering, which nothing but enlightening them can prevent. They are even more interested in such knowledge than men, and to say that they ought not to acquire

it, or that it is improper for them to do so, exhibits gross ignorance and indelicacy of mind. The fact that many among them do not desire such information, and are shocked at the idea of receiving it, merely exhibits the depth of their degradation, and is in itself a condemnation of such a state of things. Besides, we should always remember that this admiration of ignorance is very often assumed, either from the necessity of custom, or from prudish hypocrisy. Many a one pretends to condemn knowledge, who is fully aware of its importance, and secretly desirous of obtaining it.

Both men and women ought to possess a general knowledge of these subjects; so that they may know how to conduct themselves, and to instruct and advise their children. For, if they do not, their ignorance will lead them into errors, which will make them the victims of disease and crime.

In numerous cases, young women have had their health and happiness sacrificed for life, for want of a little information, which they could not ask from any one but their mothers, and which their mothers were incapable of giving. And many a son might be saved from ruin, by his father imparting to him, in time, that know-

ledge which is not likely to reach him from any other source.

Fortunately common sense is beginning to be exhibited, and such information is now desired and sought for. A short time ago I determined to try the experiment of *Public Lectures* on this subject, though rather doubtful as to how they would be received. I however made the attempt, and the result has proved that there is much more intelligence in the world than I at first thought, for they have been enthusiastically received.

One great difficelty was, to illustrate these discourses in an efficient manner. A mere verbal description would be of little service, while pictures, and diagrams give but very imperfect and inaccurate ideas. I therefore sent to Paris for a set of M. Auzoux's Anatomical Models, expressly adapted for my purpose.

These preparations answer even better than real dissections, for teaching an audience, inasmuch as the parts retain their natural appearance, and the exhibition of them is unattended by anything repugnant to the sensibilities. Their completeness, and accuracy, is astonishing; there is not a single detail that is needed, however minute it may be, but what is there, and

so true is the whole to nature, that the eye could scarcely detect it as being a work of art. Any one who has not seen them, cannot form the most distant idea of the beauty of these miracles of human skill! The conviction that they are natural is, at first, so strong, that many have even *fainted away* at a first view, from the impression that they were viewing a real body!

The set consists of *sixteen seperate models!* The first being a full sized female figure, representing the whole human structure, as common to both sexes, and the peculiarities of the maternal structure. The Heart, Stomach, and every other organ, takes out and fully dissects. The uterus, ovaries, tubes, vagina, and all the other generative organs, in the virgin state, also take out and open, so that the whole process of impregnation is clearly shewn.

The other fourteen models, represent the uterus, and its appendages, at as many different stages of gestation, from twelve days up to nine months. The fœtus within is seen, commencing with the impregnated egg, and gradually developing into the perfect being. The manner in which it is nourished, at every stage; its membranes, the placenta, cord, and every other particular.

There is also a section of the male pelvis, exhibiting the internal structure of all the male organs ; the production of the semen, and its mode of transmission.

So that, by the aid of these models, the whole subject can be as readily, and familiarly explained, to a public audience, as it is to medical students by actual dissections.

This being however the first attempt to exhibit, and fully explain, such preparations, before a public audience, I felt some anxiety, at first, as to the result. My anxiety however was soon relieved, I was fully patronised, and properly appreciated.

In the Spring of 1844, I lectured in New York City for three months without intermission, being fully attended most of the time. I never failed of receiving the applause of a single audience, and never heard a word of censure, or condemnation, from any individual. Many of the most celebrated men in the city attended, and interested themselves warmly, to induce others to do the same. These lectures, of course, were to gentiemen alone, I however delivered a course on the female structure, female diseases, &c., to ladies only, which, contrary to all expectation, were excellently well attended. Many ladies of note honored me by their presence, and some even

gave public testimony afterwards, in behalf of myself and my endeavors.

Encouraged by this support I visited many other places, with the like success, particularly Philadelphia, where my reception was so flattering that it deserves a special notice. My first course in that city was attended by over four hundred gentlemen, and two hundred ladies! Both audiences testified their entire approbation, and passed a series of highly commendatory resolutions, which were afterwards published in all the daily papers, with numerous influential names appended. Similar resolutions were also passed on many subsequent occasions, particularly by the ladies, who on one occasion numbered four hundred and thirty two! At the termination of my visit they presented to me a beautiful writing desk, with gold pen, and other appendages to suit, accompanied by a most flattering resolution numerously signed! Altogether I have lectured in Philadelphia twenty six times. I also visited Washington City, and had the pleasure of lecturing before most of the persons of note there assembled, all of whom commended the lectures in the highest terms.

My object in stating these particulars is, merely to show strangers how this attempt

has been received, and to give them confidence in it; as it is my intention to visit every city of note in the union, and not desist from my task till the public become more enlightened on these matters, and a better tone of feeling is established. The notices from different journals, which I have received, will prove that I have not exaggerated in regard to my favorable reception.

The publication of this book resulted from the success of my lectures. From every audience I had the enquiry whether there was any work I could recommend them to, on this subject. One which would enable them to pursue their enquiries after leaving the lectures, and that they could recommend to those of their friends who were unable to attend. I was constrained to say that there was no work which would serve this purpose. It is true there are several on this subject, but not one that appeared to me of the right kind. Some were only fit for medical men, being too dry and technical. Others were written merely to illustrate certain diseases, or to gratify vulgar curiosity. There was not one that gave a complete, and philosophical view of the whole subject, in all its bearings, written in a plain and popular man-

ner. I was therefore compelled to write one for the purpose. And I flatter myself that, from my experience of what the public really wanted, I have been able to produce one that will supply the desideratum. In writing my book I have partly followed the same arrangement, as that which I established in my lectures, because I have found it best calculated to give a clear, and connected view of the whole subject. I have first described the more simple phenomena of reproduction, and gradually proceeded to the more complicated, accompanying the whole with explanations, and descriptions of cases, calculated to make all clear, and easily understood.

One difficulty was, as to the kind of language to be employed. The work not being intended for the medical man only, but for the public, it would not answer to use such terms as were not generally understood; at the same time it was necessary to avoid all that were vulgar and common place. This difficulty caused me some trouble, but I trust I have succeeded in my endeavors, and that my language will be generally comprehended, at the same time that it will be correct and unobjectionable. It is possible that the scientific pedant may find some things to cavil at, but I would

rather sacrifice technical exactitude a little, than be ambiguous, or not understood by my readers.

My object has been, to produce a work which can be read with propriety, and studied with advantage, by every person arrived at the age of puberty. And which would put every parent in possession of that information, which it is the duty of parents to impart to their children.

I have not considered it necessary to shew expressly, that my object is consistent with Religion; I have merely proved it to be in accordance with the principles of virtue and morality, and these are ever in agreement with true Religion. My duty is simply to state physical facts, and moral truths; and he who cannot see for himself the force and application of those truths, would not be very capable of appreciating them if pointed out by another.

With regard to the Engravings they have been expressly designed, by myself, and specially adapted to illustrate the text. I have been careful not to put anything more in them than what appertains to the subject. It is a common fault with all anatomical plates, presented to the public, that they exhibit too many details. Instead of being confined to the actual subject they were intended to explain, they are crowded

with a number of things quite foreign to it, and the student finds himself utterly at a loss, to seperate the parts he wants, from the mass in which they are confounded. Thus in my view of the pelvis, I have represented the genital organs alone, or merely as many of the others as are necessary to shew their position and connexion.

I do not consider it necessary to say anything as to the propriety of these pictures, more than I have said respecting the work itself. If it be right to gain a knowledge of the subject at all, it is perfectly proper, as it is necessary, to study the requisite illustrations. There is nothing obscene, or improper, in such things themselves, but only in the disposition with which some unfortunate people examine them.

The Frontispiece represents the Author, as lecturing, in explanation of his large model, which stand by his side. It is from a Daguerreotype, by the celebrated "Plumbe," taken at Washington City.

This work is intended to be the first of a series, and will soon be followed by seperate treatises on, Female Diseases—Sterility and Barrenness—Midwifery—and other important topics of the like kind. It was requisite first to give a description of

the generative organs, and their mode of action, in the Normal state, which I trust the present work has done satisfactorily.

The opportunity afforded me of gaining information on all these points, is perhaps unequalled, and I intend to improve it to the best advantage. Numerous cases, of the most curious kind, are submitted to me, owing to the confidence inspired by the lectures, which would never have been known by any other person. These cases I shall use, but in such a manner that no one who has trusted to me, need fear that their confidence will be abused.

I trust that this endeavor to enlighten society, on a subject which it is highly important should be properly understood, will be successful; and I trust no one will mistake my object, or imagine evil where none is intended.

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THE

ORIGIN OF LIFE.

GENERAL VIEWS.

All living beings, both animal and vegetable, have two functions in common; one called *nutrition*, by which they are enabled, individually, to support their own existence: the other called *reproduction*, by which they bring other beings, similar to themselves, into existence. All living bodies are continually changing the material of which they are composed; the old matter is being continually removed, and new matter put in its place. This new matter is obtained from the food on which they subsist, and the changing of this food into the substance of

their bodies is called the function of *nutrition !*

The power of performing this function ceases at a certain period; the power of continuing existence is then lost, and *death* ensues! Without the function of *reproduction*, therefore, all kinds of living beings would soon become extinct, by the death of each individual, but by the exercise of this function new beings, like those from which they spring, are brought into existence. Individuals thus change, while the species remain the same.

Both these functions are carried on, in all beings alike, both animal and vegetable, on the same general principles, though the details vary owing to differences in organization and habit.

Reproduction is conducted on two general plans, the one called *sexual*, which prevails among the more perfectly organized beings; and, the other called *non sexual* which prevails among the more simply organized.

Each of these plans has various modes.

NON SEXUAL REPRODUCTION is carried on in two different modes, the one called *fissiparous*, the other *gemmiparous !*

FISSIPAROUS GENERATION is the simplest of all, and is only found in beings very low down in the scale of organization. Each individual at a certain period of its existence divides, spontaneously, into two or more parts, each of which soon grows as large, and becomes as perfect, as the parent. The means by which this singular separation and redevelopment takes place are unknown. The minute beings called *infusoria*, found in water which contains decaying animal and vegetable matter, exhibit, frequently, this mode of reproduction. In one of them, called the *volvox*, the young may be seen forming within the body of the parent, which by separating liberates them. Possibly this may be the case with the others also, though

not noticed from their extreme minuteness. In some respects this mode of reproduction resembles that which we occasionally see in some kinds of plants. As, for instance, when we cut off a slip, or branch, and plant it in the ground; it soon shoots out its roots, and branches, and becomes as perfect as the original one. In fact, some kind of animals may be propagated in this way; the fresh-water *polype* for instance. This little simply formed being is usually attached to some bit of wood, or other body, and has round its mouth a number of *tentaculæ*, or feelers, like little arms, with which it takes its food. If one of these animals be taken and cut into two or three pieces, each of those pieces will begin to elongate, shoot out its *tentaculæ*, and become in every respect as perfect as the one it was cut from. Each of these newly formed *polypi* may be again cut up in the same manner, with the same result, and so on. A part of one may also be

grafted on another, and will grow there, like a graft on a tree. In this simple process there is not, apparently, any kind of *sexuality!*

GEMMIPAROUS GENERATION is almost as simple, and is also found only in simply formed beings. In this mode a *bud*, or *germ*, is given off from the parents, and gradually develops itself into a new and similar being. The new being retains its attachment to the original one till it is perfectly developed, and then separates to live independently, and give off buds in its turn.

This propagation by buds is commonly seen in plants, and may also be observed, in precisely the same manner, in many animals. The *Hydra Viridis* for instance, and several others of the lower order of Zoophytes. In the *Sponge*, *Actinia*, and some of the Mollusca, certain parts called *Spores*, or *Gemmules*, are detached from the parents, and the new animal is gradually developed from them, like a new

plant from a seed! These Gemmules are generally rounded, and homogeneous. Sometimes they are formed in all parts of the body indiscriminately, but generally in a particular organ provided for the purpose.

SEXUAL REPRODUCTION is much more frequent than non sexual, and is found in the most perfectly formed, as well as in some of the more inferior beings. In sexual reproduction two principles are concerned, called the *male* and *female* principles; and two different kinds of organs for forming these principles, called the male and female organs. In animals the female principle is called the *ovum*, or *egg*, and the male principle the *semen*. In vegetables the female principle is called the *germ*, and the male principle the *pollen!* Neither of these two principles possesses the power of developing, or producing any new being *by itself;* the two must be *added together*, and if this union occur under proper circumstances a new being is

developed similar to the parents. The circumstances under which this union takes place vary much in different kinds of beings, but in all alike, that are sexual, these two principles exist in one form or other, and must be brought together before a new being can be developed. It is requisite not to lose sight of this fact as it is a fundamental one, and sometimes not very obvious without close observation. In the human species, for instance, the ova, or eggs, being developed within the body of the female are not seen, except by the Anatomist, and to most persons it appears very strange when they are told that the human being is developed from an egg, like a bird; such is, however, the fact, both with ourselves and with all other sexual animals.

The celebrated Spallanzani performed some curious and highly interesting experiments, in order to demonstrate these points. He took from a female fish some of the *ova*, or *eggs*,

such as are commonly seen when one is opened, and put them in a vessel of water. He then took from a male fish, of the same kind, some of the *semen*, and by means of an instrument dipped into it, touched some of the eggs with a small portion! The result was, that all those eggs which had been thus artificially impregnated, or united with a small portion of semen, began to develop, and eventually produced young fish, while those that had not been thus artificially impregnated merely decayed away, like other dead animal matter! These experiments have been repeated many times, by the author of this work, and others, and always with the same result, when due care has been taken. With vegetables also the same facts are exhibited. These are, in short, the known fundamental facts, upon which a knowledge of the process of reproduction in all its sexual varieties is based.

In some kinds of beings, both ani-

mal and vegetable, the two principles are united in each individual, which is, therefore, *both male and female;* these beings are called *Hermaphrodites!* In the vegetable world we have many instances of this arrangement, but in the animal kingdom they are chiefly confined to insects. The contrary rule is, however, the most general, the male principle being contained in one individual, and the female in another, as we find in our own species.

Hermaphrodites are of two kinds, *perfect* and *imperfect!* Perfect Hermaphrodites are those who possess *all* the attributes of both sexes; they are able, individually, to impregnate themselves and to bring forth their own young. In the summer season many instances of this kind may be found among insects. Imperfect Hermaphrodites have both the male and female principles, but are not capable of self-impregnation. A union of two individuals is always required, each one impregna-

ting the other and being impregnated by it in return. The common leech, (*Pontobdella*,) is an instance of this kind; two of them unite, each one being both male and female, and thus a mutual, or double, impregnation is accomplished.

The earth-worm, and the snail, also propagate in the same manner. The two earth-worms may often be seen, early on dewy mornings, effecting this mutual action. In plants this arrangement is very common, more so in fact than any other.

The contrary arrangement, or that where the two principles are disunited, the male being contained in one individual and the female in another, is the one prevailing among the more perfectly organized beings; as our own species for instance. Here the whole process becomes more complicated, and numerous details require explanation.

In some instances the union of the two principles is effected without any

conjunction of the two individuals, but in others the conjunction is necessary. In fishes, for instance, reproduction takes place without the two sexes coming in contact. The female deposits her ova, or eggs, in different situations according to the species, and the male afterwards deposits the semen upon them; they then commence to develop themselves and require no farther attention from either. This is very simple, but in the greater number of animals the two principles are brought together within the body of the female; this is accomplished by a union of the two in what is called the act of *copulation!* This act takes place in many different and curious ways all well deserving of attention.

The males of some birds and oviparous quadrupeds have a double, or forked organ. In some insects the organ is accompanied by two strong hooks, to seize and hold the female during the act. In some species of toads the male seizes the female with

his fore paws and embraces her so tightly that the eggs are forced out; as they leave the body he sheds the semen upon them, to impregnate them, and then fixes them, by means of a glutinous liquor which he discharges, upon the females back, where he leaves them. This animal has, on account of this curious act, been called the *Accoucheur* or *Midwife!*

In short, the structure of the organs employed, the manner of their action, the time employed, and other circumstances, vary indefinitely in different beings.

The union of the semen with the ova is called *impregnation*, and this, as we have seen, is of two kinds, *external*, as in fishes, and *internal* as in our own species, by the act of *copulation!*

In cases of impregnation internally, the impregnated ovum is sometimes expelled from the body of the female and developed *externally*—as in birds. And in other cases it remains within

the female's body and is developed *internally*, as in the human female! We thus find that *impregnation* and *development* both, are sometimes internal, and sometimes external.

The number of eggs produced by some animals, and of seeds by some plants, is astonishing. A single herring, or codfish, will produce myriads of young. Insects are still more prolific. In fact some beings would soon overswarm the world, if numerous causes were not at work to keep down their numbers. In other cases we find the number very limited.

The eggs of some insects are impregnated after they leave the body of the female, like those of the fish. Many kinds copulate, or impregnate internally. Some bury their eggs in the bark of trees, in leaves, or fruit; others in the skins of animals, in the earth, or the water. Spiders enclose their eggs in a thin skin, making a ball of them, and either hang it up, or carry it about with them till they de-

velop. Beetles may often be seen rolling their ball of eggs before them. The female crab fixes her eggs in the folds of the tail. The snake strings them all together like beads and deposits them in the sand, or in a dunghill, for the heat to hatch them. The tortoise also deposits its eggs in the sand, and leaves them to the power of the sun. Birds use the heat of their own bodies. And experiment has proved that artificial heat will answer the same purpose, see, for instance, the Eccaleobion, or establishment for hatching eggs by steam, which has recently been so successful. In fact almost every situation is used as a place of deposit for the ova of some beings who are not fitted for developing them within their own bodies. This is called *Oviparous Generation ;* The egg, or ovum, possessing all the requisites within itself, when expelled from the body, of developing into a new being, by the simple agency of *heat !*

In some rare cases, among reptiles and fishes, the egg, when similarly perfected, is hatched in the oviduct, or passage from the ovary, during its expulsion, the young are therefore born alive. This is called *Ovivivipa-rous Generation.*

In *Viviparous*, or *Mammiferous Generation*, the ovum is not previously perfected and then expelled, but begins to receive nourishment from the mother immediately upon its impregnation, and proceeds at once to develop itself. This maternal nourishment is conveyed through the medium of an organ called the *placenta*, which is attached to the interior of one of the maternal organs called the *uterus*, or *womb!* This is a kind of hollow receptacle in which the impregnated egg is placed, and in which it develops through all its various stages to the perfect being. The *uterus* is, perhaps, the most wonderful organ in the body, and certainly undergoes more singular and astonishing changes than

any other; in Mammiferous Quadrupeds we find it double. In Viviparous Generation, therefore, the new being is born alive, having been gradually formed, by the addition of new matter from the mother's body to the ovum, or egg.

In some animals, as the Kangaroo for instance, the young are expelled from the *uterus* very imperfectly formed, and are then placed in a kind of pouch, on the belly of the mother, where they remain in close contact with the mammæ, or breasts, and thus derive additional nutriment till they are further perfected. These animals are called Marsupial, from possessing the pouch, and this has been called *Marsupial Generation!* It is, however, merely a variety of the Viviparous, or Mammiferous mode.

In those singular animals, the Ornythorynchus and Echidna, the generation is apparently a combination of the Oviparous and Mammiferous modes, and has been called *Monotre-*

matous Generation! It is, however, so rare, and so little understood, that no description can well be given of it.

We have thus given a general description of the various modes in which reproduction is carried on, ascending gradually from the simple to the more complicated. We will next proceed to illustrate more fully the most perfect of all the sexual varieties, the Viviparous, or Mammiferous, by fully explaining all the details of the process in the human species.

The following table, which is formed on the same plan as that by Dr. Allen Thompson, in "Todd's Cyclopedia of Anatomy and Physiology," article "Generation," exhibits all these varieties in their proper order.

I.

NON SEXUAL GENERATION!

VARIETIES.

Fissiparous.
When the parent divides into two or more parts, each parts becoming a new being.

Gemmiparous.
When the parent gives off, or throws out, a *bud*, or part which develops into a new being, like the seed of a plant.

II.

SEXUAL GENERATION!

VARIETIES.

Hermaphrodite.
Where both sexual organs are found in the same individual. Sometimes the individual impregnating itself, (Perfect Hermaphrodites,) in others two mutually impregnate each other (Imperfect Hermaphrodites.)

Diœcius.
Where the male and female organs are in different individuals. Sometimes the eggs are impregnated externally, without any union of the two; sometimes internally by the act of *copulation!*

MANNER OF DEVELOPMENT.

Oviparous! Eggs laid and afterwards hatched.
Oviviviparous! Eggs hatched within the mother's body.
Viviparous, or *Mammiferous!* The young formed from the egg and the mother's blood in the uterus, and brought forth perfect.
Marsupial! As in the Kangaroo, Opposum, &c.
Monotrematous! As in the Ornythorynchus, and Echidna.

Instead of referring to the Plates in the Body of the work, I have thought it better to give a description of each one on a separate sheet facing it. These should be studied first, and then referred to, to illustrate the work at the page indicated.

PLATE 1, p 23.

EXTERNAL FEMALE ORGANS.

No. 1.—The Mons Veneris.

No. 2.—The External Lips, thrown back.

No. 3.—Internal Lips, or Nymphia, also thrown back.

No. 4.—The Clitoris.

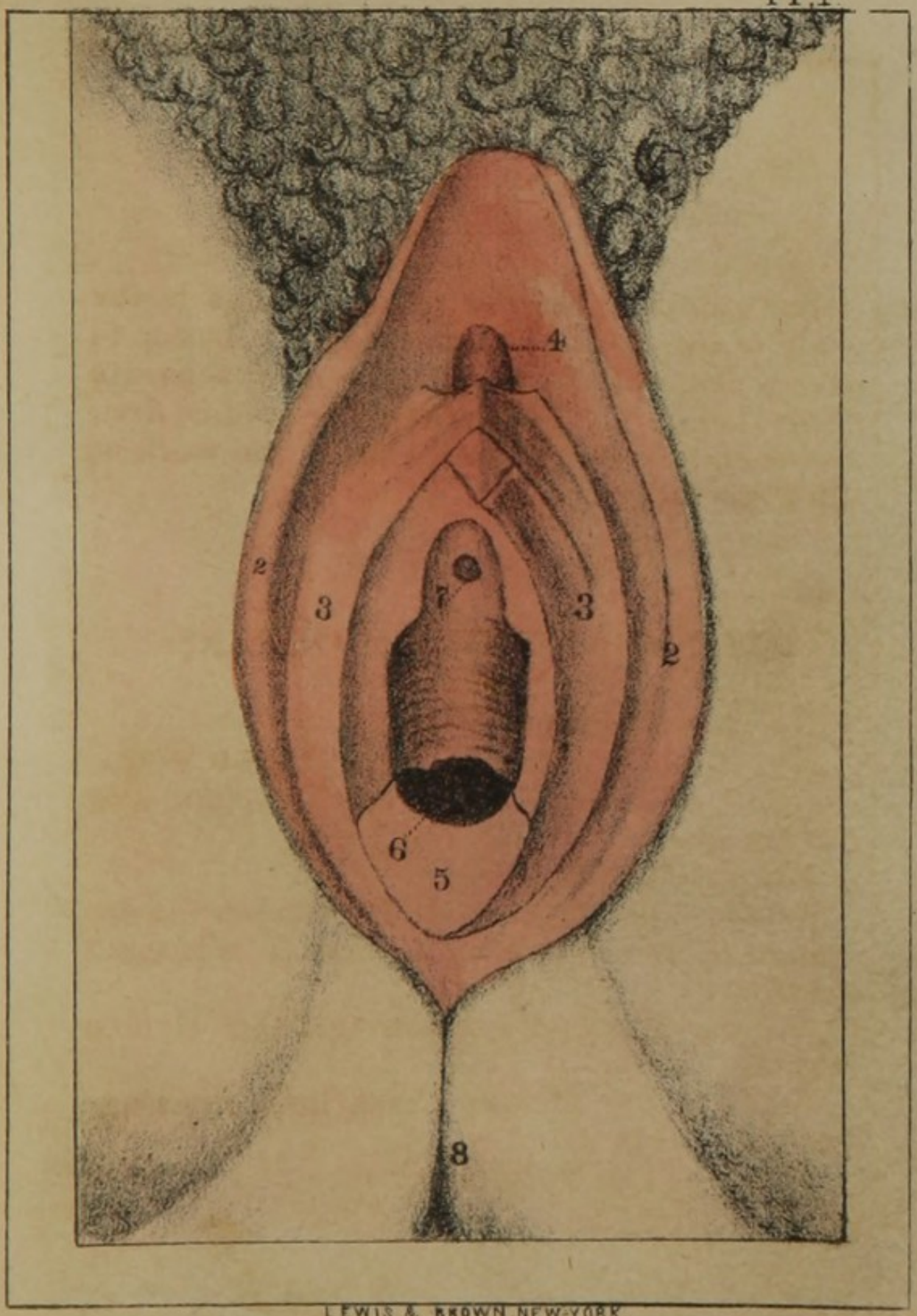
No. 5.—The Hymen, which closes the entrance to the Vagina; through it is a small aperture.

No. 6.—The opening through the Hymen into the Vagina.

No. 7.—The Meatus Urinarius, or passage from the Bladder.

No. 8.—The Perineum.

Pl. 1.



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PHYSIOLOGY OF GENERATION

IN THE

HUMAN SPECIES.

FEMALE SYSTEM.

THE part which the female has to perform in the process of reproduction is much more extended than that of the male. Her organs are, therefore, more numerous, and more complicated in their action. Commencing externally with our examination we first find the *Mons Veneris*, or Venus' Mount; an accumulation of adipose matter upon the bones of the pubes, immediately below the abdomen. At the age of puberty this increases in

size and becomes covered with hair. Immediately below this are two thick fleshy lips, called the *Labia Pudendi*, or external lips, which extend downwards and backwards to within two or three inches of the anus, from which they are separated by the part called the *Perineum*. Where they join below is called the *fourchette*, or fork. Before puberty they are firm, and close together; after marriage they become more lax, and usually of a blueish tinge. Like the *Mons Veneris* they also become covered with hair. On their inner surfaces are a number of minute *follicles*, or little vessels, which secrete a kind of mucus to prevent injury to them from friction against each other. Sometimes from disease, or want of cleanliness, this discharge becomes acrid, excoriates the lips, and causes them to grow together. This is also found to be the case sometimes at birth.

On opening these we find two other smaller lips, called the *Labia Minora*,

gins, the sensation experienced when feeling it, is almost identical with that imparted to the finger when pressing the end of the nose. In certain stages of pregnancy, and at some other times, it will allow of the introduction of the finger. The uterus is kept in its place by means of an apparatus called its *ligaments*. These are two in number on each side, one called the *broad*, and the other the *round ligament!* The broad ligament is a fold of the peritoneum, which partly wraps round the uterus, and is then attached to the sides of the pelvis. The round ligament is something like to a cord, it grows to the side of the uterus at its upper part, and is then continued downwards till it reaches the bones of the pubes in front, where it is attached. If the womb itself, and its ligaments, be healthy and firm, it will generally retain its place, but if they become softened and relaxed it naturally falls down, producing a prolapsus, or falling of the womb.

About three inches from the uterus, one on each side of it, enclosed in the broad ligaments, are found two organs more essential than any others in the process of reproduction. These are called,

THE OVARIES! Seen externally each appears about as large as the end of the thumb, of an oval shape, and wrapped in the broad ligaments. On removing the outer covering we find them to be composed of several small round bodies, each about the size of a pea. These are called the *ova*, or commonly the *eggs!* Their number varies from two or three to thirty or more, the average being about fifteen or twenty. The Anatomical structure of these eggs it would be tedious and uninteresting to give in detail. They resemble small bags, or bladders, filled with a thin whitish albuminous fluid, similar to what we find in the eggs of other animals. In fact if we were to take an ovum from a human female and magnify it, and then compare it

PLATE 3, p. 35.

INTERNAL FEMALE ORGANS.

A section of the Vagina, the Uterus, and its appendages, from side to side.

No. 1–1–.—The thick walls of the Uterus.

No. 2.—Cavity of the Uterus.

No. 3.—Mouth of the uterus.

No. 4.—The Vagina.

No. 5–5.—The round Ligaments.

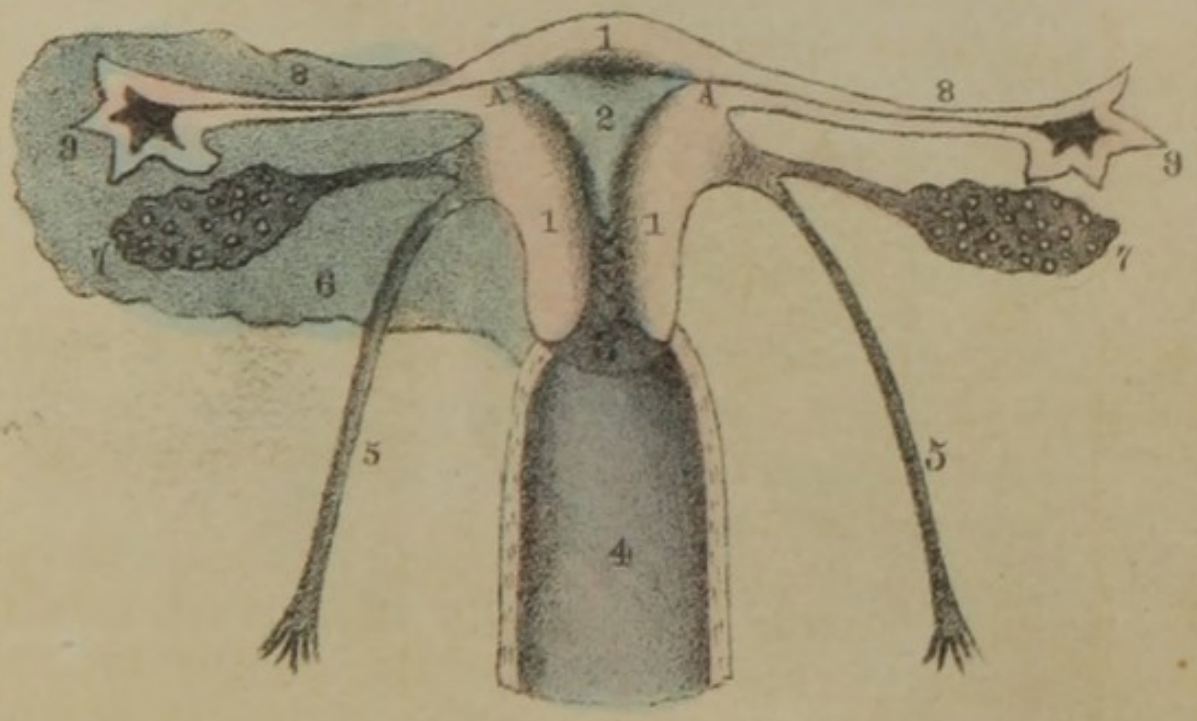
No. 6.—The broad Ligament, which is only represented on one side.

No. 7–7.—The Ovaries. The Ova are represented by the dots.

No. 8,–8—The Fallopian Tubes, down which is seen a black line ; this is the small passage, proceeding from the Uterus to its open end.

No. 9,–9.—The Fimberated extremities of the tubes, showing the fingers to grasp the egg.

A,–A.—The commencement of the passage down the Fallopian Tube.



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with the egg of the common chicken, we should find no essential difference between them. They are in fact the same thing, and the human being is developed from the human ovum, precisely the same as the bird from the egg of its particular kind. It appears that the rudiments of these ova form part of the original structure of the female, they are born with her, and not formed during her life. Their number, therefore, necessarily limits the possible number of offspring, and their entire absence causes incurable sterility or barrenness. Sometimes persons are born without them, but very rarely, and sometimes they will be destroyed or injured by disease. In the lower animals they are occasionally removed by the operation of *spaying*, to prevent the female breeding. In old age they generally waste away, as they also do from other causes. After pregnancy we usually find a kind of yellow scar on one of the ovaries, covering a little pit, or hole,

from which the egg was taken. These scars are called *corpora lutea*, and their number indicates the number of impregnations the female has had. In cases of twins *two* eggs are impregnated, in triplets *three*, and so on. From several causes it appears that impregnation takes place only on one side at a time, but why this is, or what determines which side it shall be, we do not know. It was formerly supposed that the ova on one side produced males only, and those on the other females only. This, however, is known not to be the case. Females have been found after death with only one ovary, who have borne children of both sexes. And in case of twins we sometimes find a boy and a girl, though the two ova, in all probability, came from the same ovary. This, in fact, was merely a fanciful theory, invented to cover ignorance. In like manner these two organs were formerly called the *female testicles*, from a mistaken idea that they were glands, and se-

creted a fluid which passed into the uterus, at the time of connexion, mixed with the male semen and so formed the fœtus. Many other erroneous suppositions of this kind might be mentioned, but none of them are deserving of notice.

The ova being thus placed outside of the womb, and only connected with it by a ligamentous cord, down which there is no opening, it will be evident that some kind of apparatus is needed by which they can be brought to it. An apparatus of this kind exists in two passages, called,

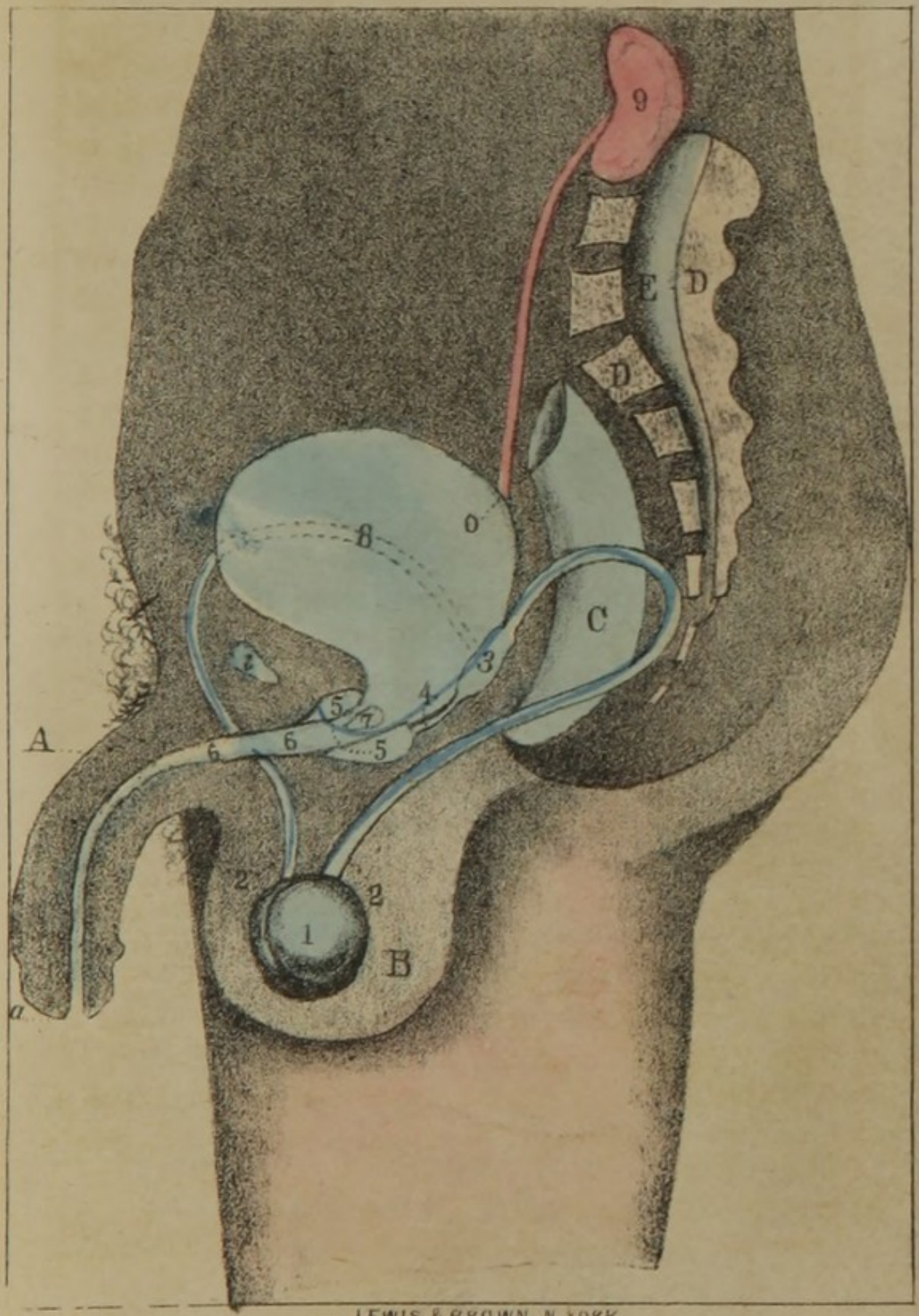
THE FALLOPIAN TUBES! These are two tubes which are placed one on each side of the womb. They spring from each side of the fundus, at the top, and proceed nearly alongside of the ligamentous cord of the ovaries, which they exceed in length. The end of the tube which joins the uterus is about the size of a quill, and the passage which opens from it would not more than admit a bristle. This

passage, however, keeps gradually expanding, until at the farther extremity it will admit of a large pea, sometimes even the end of the finger. The fallopian tubes are, therefore, funnel-shaped, the small ends joining the uterus, and the larger ends floating freely in the peritoneal cavity. Their total length is about four inches. The ends which float free are expanded and reflected back, like the wide end of a trumpet. They are also divided into a number of little fingers, or *fimbriæ*. The use of these tubes is to convey the semen to the ovaries, and to conduct the ova into the womb to be developed. The fimbriæ, or fingers, are to grasp the egg and conduct it into the tube. This will be fully explained when we treat on Fecundation. If a female be born with no passage in these tubes, or if it be obliterated from any accident or disease, she will be as incurably sterile, or barren, as if she had no ova, because there will be no communication with them.

PLATE 4, p 40.
THE MALE ORGANS.

Section of the Male Pelvis, to exhibit the Internal Organs of Generation. No. 1-1—The Testicles. 2-2—The Vas Deferens, or tube from each Testicle along which the semen is conveyed. 3—The left seminal Vesicle, into which the semen is thrown by the Vas Deferens. The right Seminal Vesicle is immediately beyond, on the other side of the Bladder, which hides it. The course of the right Vas Deferens, behind the Bladder, is shewn by the dotted lines. 4—The Ejaculatory Canal, down which the semen is sent into the Prostate Gland, through which it flows into the Urethra. 5—The Prostrate Gland. 6-6—The Urethra, or Passage from the Bladder. The Semen enters the Urethra, from the Prostate at the point marked by the dotted lines. 7—The Veru Montanum, or projecting point, which prevent the Semen from entering, and the Urine from returning into the Bladder. 8—The bladder. The Urine is secreted by the Kidneys, and passed down the tubes called the Ureters, into the Bladder. 9. The left Kidney, the other being on the opposite side of the Spine. 0—The Ureter, or Tube from the right Kidney, which brings the Urine into the Bladder; it opens by a small valve. A—The Penis. *a.*—The Glans Penis. B—The Scrotum, or Sack which contains the Testicles. C—The Rectum. *b.*—The Section of the Pubic Bone. D-D-E.—The Spine. The blue line marks the course of the Semen.

Pl. 4



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We have now given an account of all the organs in the female body which are concerned in the process of generation. There are some few others, as the mammay glands, and the milk tubes, which are employed in ministering to the wants of the new being immediately it is born, but not immediately in the process of reproduction itself, we need not therefore describe them here.

The whole of the generative organs are closely connected in one common bond of sympathy, both with each other and with almost every other part of the system. And it is probable that nine-tenths of all the disease and suffering which females endure originates with them.

In both sexes the development of the sexual organs produces the most remarkable changes in the whole being. These changes are perhaps much more strikingly marked in the female than in the male. If we compare the young girl before puberty, with the young

woman after, this will be strikingly evident. The change is complete, both in body and mind. The complexion improves, the countenance becomes more expressive, the conversation more intelligent, the voice more harmonious, the whole frame, but particularly the breasts are expanded, and the mind is no longer engaged with childish objects and pursuits. The period when this change occurs varies, from eight or nine years of age to nineteen or twenty, according to climate, constitution, mode of life, food, and the manners of those with whom the young person associates. In our country it occurs about the fifteenth year. Before that time the young female presents the same phenomena of growth and development as the young male. But when that period arrives the sexual and nutritive organs are at once brought into a state of remarkable activity, so as to almost keep the rest of the system in abeyance.

MENSTRUATION! Previous to puberty the young girl is able to produce sufficient blood for the sustenance of her own body, the same as the boy, and no more, but when that period arrives she produces more than she needs herself! What then is the object of this superabundant nutriment, and what becomes of it? When a female becomes pregnant this additional blood is used to form the body of the child, so that no special drain is made on the mother herself, and after birth it goes to form the milk for its subsequent support! If the female remain unimpregnated this additional blood is nevertheless formed, but as it would merely clog up the system when it is not needed, an arrangement is made by which it is periodically removed. This occurs about once a month. The blood accumulates in the vessels of the uterus, from the inner walls of which it gradually exudes, and so escapes by way of the vagina. This is called the function of *menstruation*,

and when it occurs the female is said *to menstruate*, or commonly, to be *poorly* or *unwell!* The discharge ordinarily continues about four days, and the quantity evacuted is about five or six ounces. In healthy females this function is generally performed with great regularity about every month. Conception does not take place before it occurs, nor after it ceases. It stops during pregnancy, and while suckling, because it is needed in the one case to nourish the child, and in the other to form the milk.

Great *irregularity*, however, prevails in this respect, and much mischief results in consequence. Some menstruate oftener than monthly, others not so frequently. Some are flooding continually while others have no discharge at all. Some females even menstruate while pregnant, or while suckling. Some discharge immense quantities, and others have merely a show. All these irregularities are merely the morbid deviations of a

natural function, which, in its healthy state should be exercised nearly as we have stated. In different countries, and different individuals, the period when menstruation ceases varies as much as the time when it commences, and there is an evident relation between the two. Thus in Greece, and other hot countries, where the girls begin to menstruate at eight or nine years of age, they usually stop at thirty-five or forty. In Lapland, and other cold countries, where the commencement is postponed till nineteen or twenty, the cessation will be protracted till fifty or sixty. In our own country the commencement is usually about fifteen, and termination about forty-five or forty-eight. The cessation of the menses is called *the turn of life*, it generally produces great changes in the person, and for ever after destroys the capability of conception.

The menstrual fluid differs considerably from pure blood, owing to its

having other substances mixed with it, to make it more disposed to organize. It will not coagulate, but often appears loaded with albumen, and sometimes we see it form into hard clots, or even into membranes. In most cases it has a peculiar smell, but sometimes it is perfectly inodrous. The vessels which regularly secrete it, are the uterine arteries, at the fundus. When it occurs during pregnancy it is probably from the arteries in the vagina only.

In former times many superstitious and erroneous motives existed respecting this secretion. It was supposed to possess the most malignant properties, and to be capable of producing the most virulent diseases. The female while menstruating was called *unclean*, banished from society, and subjected to harrassing restrictions. In the old Jewish laws we find many instances of this kind, see, for instance, Isaiah, chap. xxx., and in Ezekiel. Even at the present time these notions

prevail in some places. There is no reason, however, to suppose anything malignant in this discharge, nor do we find it necessary to exclude women from society while it is upon them. Although, for obvious reasons, it is advisable that those who are married should, at that time, keep apart from their husbands.

Disordered menstruation is very general, and produces three fourths of the diseases which females labor under. The nature of the discharge and the consequences of its irregularity are generally unknown. The majority of young girls know nothing about it till it takes place in themselves, and then, in their ignorance, they often resort to means to check it. Numbers are made to suffer from pain and disease all their lives after, from these imprudences, and we are gravely told that it is right and proper they should do so, rather than learn the truth respecting their own structure! Such notions are characteristic of gross ig-

norance, and innate indelicacy of mind, it is time they were removed.

This subject will be referred to again.

PHYSIOLOGY OF GENERATION

IN THE

HUMAN SPECIES.

MALE SYSTEM.

THE first part of the male apparatus to be described is composed of two bodies denominated

THE TESTICLES! These are two oval-shaped glands, suspended in a kind of envelop, or bag, between the thighs, nearly in the situation of the female vulva. Their use is to secrete the *semen*, or male principle. The sac which contains them, called the *scrotum*, is composed of common in-

tegument, and, like the mons veneris in females, is covered at puberty with hair; it is divided into two parts by a membranous partition, so that each testicle has a separate cavity. A portion of the peritoneum from the abdomen also encloses each, called *Tunica Vaginalis*, and this is reflected, or doubled, so as to surround them twice, the reflected portion being called the *Tunica Albuginea*, from its white color; this is in immediate contact with the testicle.

A layer of sub-cutaneous muscles also passes under the scrotum, to assist in its support and to raise and depress it, this is called the *dartos!* Each testicle is composed of a number of small vessels, derived from the spermatic arteries, which are bent into a serpentine form, and convoluted into little heaps, separated from each other by cellular partitions. From the blood, at the minute ends of these little arteries, is formed the *semen*, by what process we do not know. Immediately where

the artery ends is a little duct to receive the semen as it is formed. These seminal ducts are very numerous and form a kind of net work attached to the *Tunica Albuginea*, called the *rete testes*, or *Corpus Highmorianum !* From this net work proceed some twenty or more tubes, all of which are curiously contorted, and at last unite together, on the posterior margin of the testicles, into one common duct, which is bent and twisted in a variety of ways till it forms a hard body called the *Epydydymis !*

The arteries and nerves which go to the testicles, and the veins and vasa-deferentia which come from them, are bound together in two bundles, each of which is enclosed in a sheath, one of these collections ascends on each side. They are called the SPERMATIC CORDS !

From the epydydymis arises a tube called

THE VAS DEFERENS, which ascends to the abdomen and conveys the semen

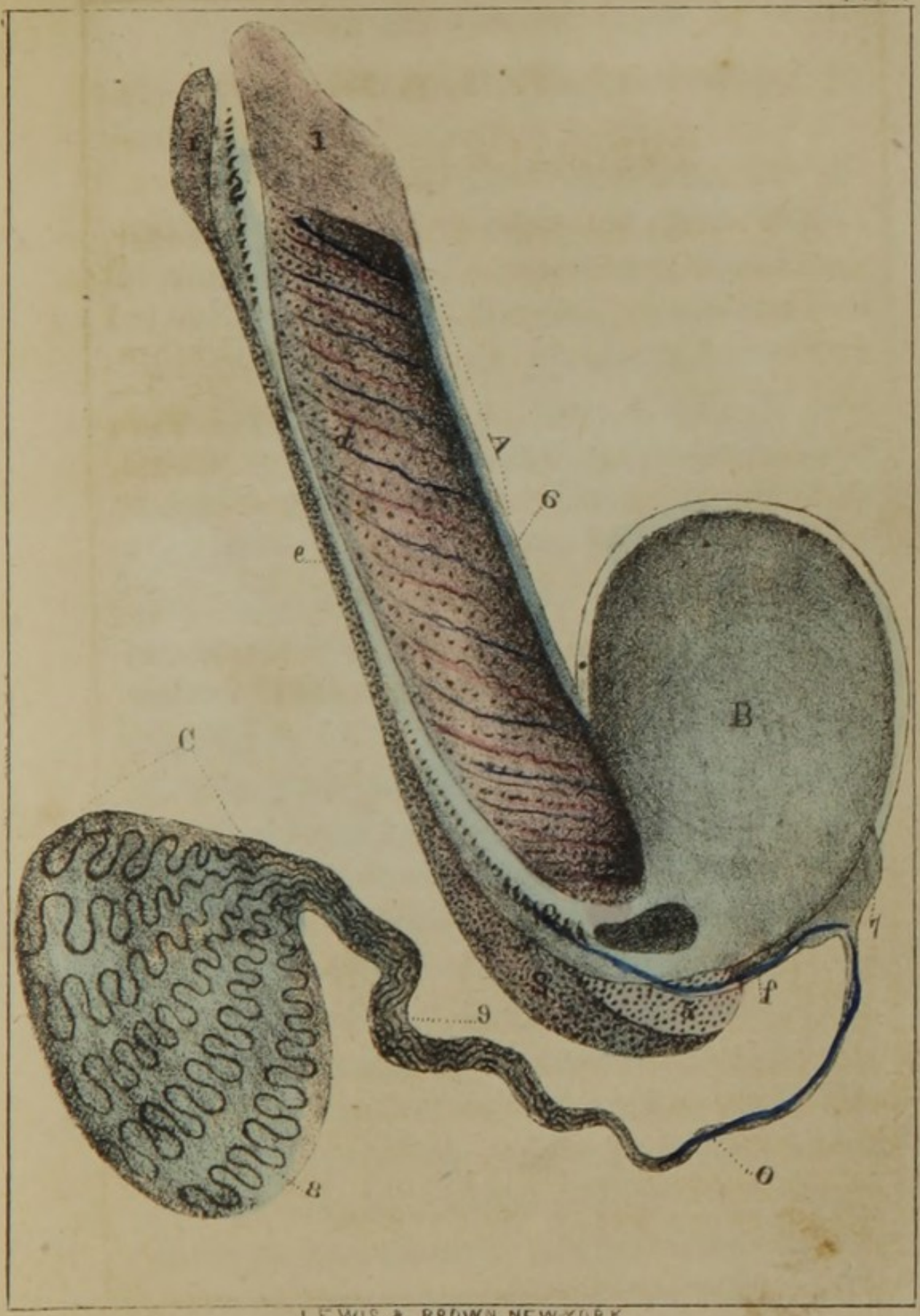
to its destination. The diameter of these excretory ducts is very small, probably not more than the two hundreth part of an inch, while their whole length, in one testicle only, has been calculated at *five hundred feet!* The vas deferens from each testicle ascends upwards into the pelvis, takes a circuitous route nearly as high as the top of the bladder, behind which it descends till it reaches

THE SEMINAL VESICLES! These are two oblong blind sacs, situated behind and nearly at the base of the bladder, between it and the rectum. The two vas deferens empty into these seminal vesicles, but for what purpose is not precisely known. Hunter supposed that the vesicles secreted a peculiar fluid which mixed with the semen and modified it, because he found it different in them to what it was in the testicles. The most prevalent opinion, however, is, that they are reservoirs in which the semen is contained till it is evacuated. From the seminal vesi-

PLATE 5. p, 53.

THE MALE ORGANS.

A Vertical Section of the Penis, Bladder, and one of the Testicles. A—The Penis. B —The Blad er. C—The Testicle. No. 1–1 —The Glans Penis. No. 2–2—The Urethra, or passage for the Semen aud Urine. No. 3— The Bulb of the Urethra. No. 4—The Veru Montanum. No. 5.—The Prostate Gland, through which is seen a small passage by which the Semen reaches the Urethra. No. 6.—The great Artery running along the top of the Penis; numerous small branches are seen ramifying from it into the substance of the organ. No. 7.—The Seminal Vesicle. No. 8.—The Seminal Tubes in the Testicle. These are all seen meeting together to form the Epydidymis. No. 9.—The Epydidymis, a collection of Seminal Tubes. No. 0.—The Vas Deferens, or Tube into which the Epydidymis pours the semen. This Tube, it will be seen, joins the Seminal Vesicle. *d.*—The Corpus Cavernosum, or main part of the Penis. This is seen to be full of pores like a sponge. *e.*—The Corpus Spongiosum, or lower part of the Penis, which surrounds the Urethra. *f.* The ejaculatory canal, through which the semen passes from the Vesicle to the Prostate Gland, on its way to the Urethra.



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cles proceeds a passage, common to both, called

THE EJACULATORY CANAL, which passes through a heart-shaped body, about the size of a chestnut, called

THE PROSTATE GLAND, and empties into the urethra, or passage from the bladder, nearly at the neck of the bladder itself. From this passage it is finally evacuated. The urethra is therefore common to both the urine and the semen. The prostate gland is supposed to secrete a fluid which mixes with the semen and still further modifies it. At the place where the semen enters the urethra is found a small projection, called the *veru montanum*, which appears to block up, as it were, the entrance into the bladder, and so prevent the return of the urine, or the entrance of the semen into that organ.

THE PENIS is a remarkable organ, possing the power of *erection!* This power is owing to its peculiar structure. It is composed of a spongy, fleshy substance called the *corpus*

spongiosum, which partly surrounds the urethra, and of two other porus masses, called the *corpora cavernosa*, which form its main bulk. These parts are all formed of the peculiar substance denominated the erectile tissue, and the whole organ is somewhat like a sponge. The little cells of which it is composed are ordinarily empty, they, however, communicate with certain blood vessels, derived from the spermatic arteries, from which they can be filled. During venereal excitement the blood flows from these vessels into the little cells, and fills them up, the whole organ then becomes swollen and distended, the same as a sponge when dipt in water, and it is then fit for its office, of introducing the semen to a sufficient distance in the female organs. Many different muscles, by their contraction, assist materially in forcing the semen along, by compressing the parts which contain it, and also in the process of erection. At the extreme end

of the penis the corpus spongiosum is expanded into what is termed

THE GLANS! This is very sensitive, somewhat resembling the clitoris in females, and, like it, is the principal seat of pleasure. Both the glans and the clitoris are profusely supplied with nerves, to which is owing their extreme sensitiveness. I have known men as much inconvenienced by an excess of this sensitiveness as the female before referred to. The glans is covered by a thin fold of skin, called

THE PREPUCE, which can be drawn from over it. This is the part formerly called the *foreskin*, and which is cut off in the rite of circumcission. This rite was probably established to prevent the effects of uncleanliness in these parts. Around the glans are situated a number of follicles, similar to those in the labia of females, and which secrete like them a peculiar odorus fluid. This secretion, in warm countries, is apt to become morbid and excoriate the surrounding parts, hence

circumcision. The surgeon has frequently to perform this operation now, in many cases of disease.

THE URETHRA, or passage along the penis, by which is evacuated the semen and the urine, is a membranous canal, lined with a mucous coat, and having numerous mucous follicles in its walls. Its diameter varies in different parts, being largest about two thirds down, near what is called the *bulb*. Many different glands are situated along it, some of which probably supply fluid to mix with the semen, or to counteract the acrimony of the urine. Sometimes children are born without the urethra, the penis being imperforate; in this case there is generally a hole by the bulb, from which the urine escapes. Fortunately this accident is rare. The urethra is exceedingly sensitive, and very elastic. At the inner end it opens into the *bladder*, which may properly be considered as an expansion of the urethra itself.

The male, like the female organs, sometimes exhibit curious anomalies, both in their formation and mode of action. The average size of the testes is about that of a small Pigeon's egg, flattened, sometimes they are much larger, and occasionally only the size of a marble. The proper number is two, though we sometimes find but one, and then it is mostly large. Sometimes the number is three, one of them being small, or rudimentary.

Sometimes we find the deficiency in size, or number, accompanied by a diminution, and the excess by an increase of power, but not always. In many of these cases where three testicles are supposed to exist, one is merely a small tumor, which will remain unchanged perhaps for the whole of the persons life. Some Anatomists have asserted that the supernumerary body is always a mere tumor, and from its not invariably producing an increased flow of semen, there appears some probability in this. Still, however, I have

known cases where the whole three were average size, and so much alike that it was not possible to distinguish them. In this case I am inclined to think that three testes did actually exist. I once knew two brothers, one of whom possessed but *one* testicle, and the other *three*, as if they had been unequally distributed.

In the fœtus the testes are placed within the pelvis, from whence they descend after birth. In some rare cases they do not descend till a late period, or even not at all, but still the person may be able to impregnate. This accounts for those curious statements we have sometimes heard, of men impregnating without testicles. In these cases they were merely not descended.

The average size of the penis is from six to eight inches in length, and from one inch to one and a half in diameter. Occasionally it is found so much larger as to preclude the possibility of sexual connexion, altogether. In other

cases we find it so remarkably small as to be inefficient. And sometimes it has to be amputated from disease or accident. In these cases various mechanical contrivances are used to enable the individual to copulate. Instances have been known of the penis being *double!* I once saw a case of this kind where the organ seemed as if it were split in two. Though both parts were capable of erection, only one had an urethra, this was also of the natural size, the other much smaller; when copulating the imperfect one had to be held firmly against the abdomen. Children are sometimes born with the penis adhering to the skin, or the scrotum; these malformations are easily remedied by the surgeon.

THE SEMEN! This fluid, secreted by the testicles, possesses the power of exciting the female ovum, or egg, and enabling it to develop into a new being. Its composition is simple, differing but little from many other substances in the body. It is heavier

than water, of a whitish color, and possesses a peculiar odor, with a sapid saltish taste. Its odor is specific and heavy, but not disagreeable, and resembles that of the roots of the orchis, the Iuli of chestnuts, and the pollen of several plants. In some animals the smell is so strong as to pervade the flesh of their bodies, and in many it is observable at a great distance.

According to the analysis of Vauquelin, it contains six per cent of animal mucus, three of phosphate of lime, and one of free soda, the rest being water.

It is probable, however, that there is some substance in it too subtle for the chemist to abstract. The composition of the semen, it will be seen by this, so far as known, is not peculiar, and gives no indications of its power. Physiologists, therefore, were utterly at a loss to imagine what this depended upon. Fortunately a discovery was made which seemed to throw a little light on the mystery. Leewenhoek,

PLATE 6, p. 61.

SEMINAL ANIMALCULE.

This plate exhibits the form of the Seminal Animalcule; and also its resemblance to that of the Brain and Spinal Marrow, to illustrate the Neuro Spermatic Theory of Generation.

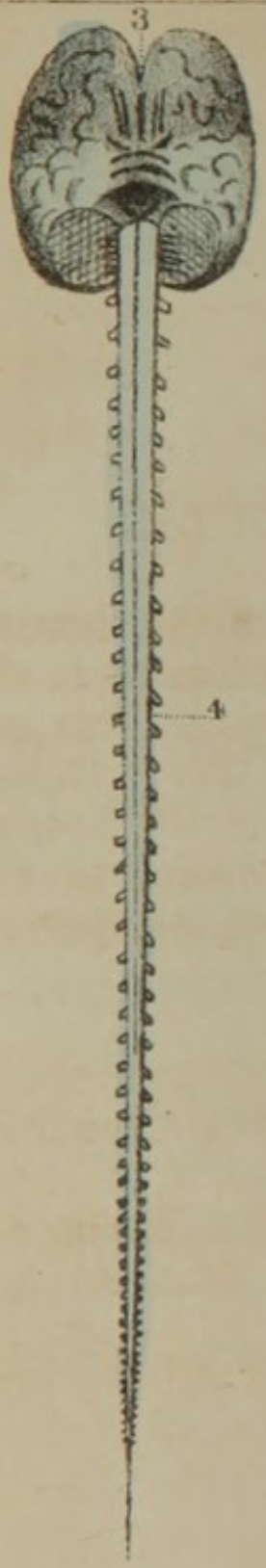
No. 1-1-1.-Magnified views of the Seminal Animalculæ, enlarged many thousand times.

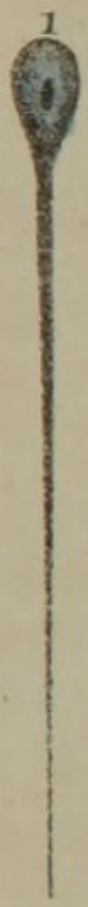
No. 2.—The same in bunches, as they are usually seen.

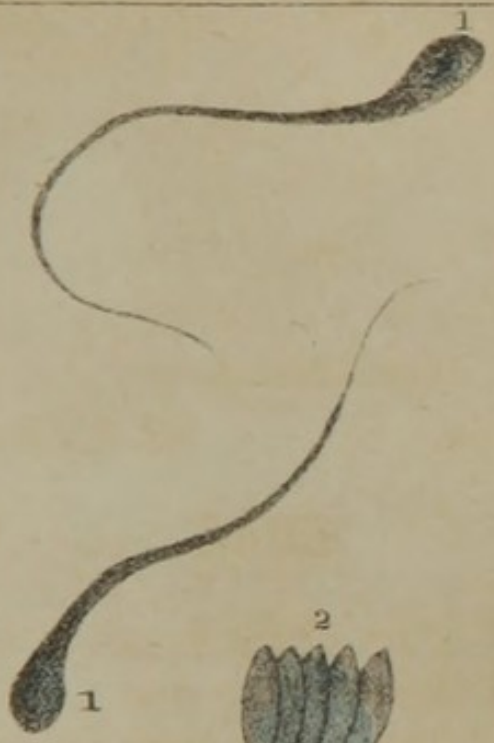
No. 3.—The Brain.

No. 4.—The Spinal Marrow proceeding from the Brain, with the nerves branching from it cut off.

The resemblance between the Brain and Spinal Marrow, and one of the Seminal Animalcules will be seen at once, by comparing them together as they are placed side by side.







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or, as some say, Ludwig Haan, in the year 1677, when examining a portion of semen with the miscroscope, discovered that it contained an immense number of small living Animalculæ. This naturally excited great surprise, and it was at first thought that their existence might, in this case, be merely accidental. Subsequent investigation, however, established the fact, that they are to be found, at one time or other, in the semen of all animals that has been examined. But only at that period of life, and in that season of the year, when the animal is fit for procreation. Thus they are not found in the human being before puberty, after the virile power is exhausted, nor when the individual is impotent. In animals who only copulate at certain times, they are only to be found at those times. They appear, therefore, to be essential to the act of impregnation, which in all probability cannot be performed without them. Their form, appearance, and size, differs

much in different beings. But in the more perfect animals they always resemble the kind of Animaculæ called *entozoa.* In the human being they have a large flattened head joined to a long tapering tail, much like a tadpole. They are exceedingly small, associated together in bunches, and very lively in their movements. Many curious statements have been made about them, by Physiologists, which probably are the offspring of excited and ardent imaginations. One man went so far as to suppose he had discovered the future human being, perfect in all its parts, in the little animacule. Future observers, however, have not been so fortunate.

I believe all has been stated here that is known with certainty. In looking for them the semen must be diluted with water, and a small portion put upon a slip of glass; when this is nearly dry they can easily be seen with a good microscope. The pollen of most plants appear also to be peo-

pled with similar beings, so that possibly they are the originals of all living things. In many diseases they disappear, sometimes permanently, and at other times they return when the disease is cured.

We thus find that the semen is first secreted by the testicles, passed through all its long and tortuous tubes, and then enters the vas deferens, by which it is conveyed into the seminal vesicles. From these it passes along the ejaculatory canal, through the prostate gland, and enters the urethra close by the neck of the bladder. From the urethra it is emitted, at the time of connexion, into the vagina. Whether it proceeds immediately from the testicles at each act, or from the seminal vesicles, we do not know. From the vagina it is taken to the ova, or eggs, to effect their impregnation, and so cause their development. This final union of the two principles is called the act of impregnation.

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IMPREGNATION.

THIS appears to be accomplished, so far as we know, in the following manner. When the semen is emitted into the vagina, it is sucked or absorbed through the mouth of the womb into its cavity, from thence it is farther taken along the passage in one of the fallopian tubes, the free end of which at that time clasps the ovary! The semen, therefore, when arrived at the end of the tube, is brought into con-

tact with the external envelop of the ova, or eggs, and by some means either penetrates to one or more, or by its presence so affects them that they begin at once to develop.

An egg thus impregnated begins to increase in size, and after a certain time separates from the ovary, it is then caught hold of by the fimbriæ at at the end of the tube, and gradually brought down the inside of it into the womb, where it is fully developed into the new human being. The full details of this process will be given further on.

If two eggs are impregnated we have twins, three triplets, and so on. Usually we have but one. What determines the number we do not know. Triplets are common; four at a birth I have known myself, and we have cases stated of five, on very good authority, but this I cannot vouch for from my own knowledge. All accounts of still higher numbers are doubtless apocryphal.

From several circumstances it appears nearly certain that impregnation only takes place on one side at a time, but what gives the preference is unknown. The time which it takes for the semen to reach the ovary is also unknown, though from certain experiments it seems to be not more than two or three minutes.

Some Physiologists contend that a portion of the semen itself permeates the envelop of the egg, unites with it, and produces a series of motions which lead to its development; similar to what we see in a portion of fermentable liquor when a drop of yeast is added to it. Others suppose that there is merely an *Aura*, or *exhalation*, a kind of *spirit*, which proceeds from the semen and effects the change. While others again contend that the fecundating fluid is taken into the blood and reaches the ovaries through the circulation.

From observations made upon animals I am confident, myself, that the

semen actually passes unchanged along the tubes, and I have no doubt but that one of the little Animaculæ makes its way through the envelop and so enters the substance of the ovum.

This opinion of the actual contact of the semen and ovum is also borne out by analogy. We find the two directly united in the case of fish, as before shown, and we also see the pollen of plants applied unchanged to the female germ.

It is likewise a matter of dispute whether there is a special set of *absorbent* vessels which take up the semen and conduct it to the tubes, or ovaries, or whether it is taken direct along the passage, by a process of *suction !* From certain facts recently observed, it appears that the uterus descends a little at the time of connexion, the mouth opens, and draws the semen up into its cavity, from whence it travels along the tube. But, again, other experiments have proved that if the semen be merely artificially lodged

in the *vagina* of a female, in a certain state, it will impregnate her. This I know to have been done. From these two kinds of experiments it would appear that there is both a process of *suction* and *absorption*, exercised either together or separately. The result of certain practices for preventing conception, now so much resorted to, also uphold the same view. Thus some females insert a piece of sponge into the vagina before conception, and afterwards withdraw it with a string, bringing the semen with it. This of course, by stopping up the mouth of the uterus, prevents the semen being *sucked* through it. In some cases this plan succeeds, but *in many others it does not!* In the cases where it fails, therefore, we are almost compelled to admit that *absorption* of the semen must occur from the walls of the vagina. While in those cases where it succeeds it seems sufficient to merely prevent its being sucked into the womb. Possibly the organs of some

females are more disposed to one mode of action, and some to the other. Another practice also, that of syringing the vagina after connexion with some solution, to destroy the semen, or astringe the mouths of the absorbent vessels, is sometimes successful, and at others not, which can only be explained on the same supposition. This being a matter of doubt, I have thought it best to give the facts and arguments in favor of both views.

I am inclined to think, myself, that the womb descends, its mouth opens, and the semen is *sucked* into it, and along the tube, *when the connexion is pleasurable to the female!* And that when she experiences no pleasure the mouth of the womb does not descend and open, but the semen is slowly *absorbed* from the walls of the vagina! This view is supported by many facts which have come to my own knowledge. The mechanical act of *suction* may be explained by supposing the excitement to expand the womb, and

the end of the tube; in which case a vacuum would be created, and the semen below would of course rush upward into it.

For impregnation to take place, therefore, it is necessary for the ova, and semen, to be perfect, and for the other organs, in both, to be capable of performing their part in the bringing of these two together. How they perform it, as we have stated, is not precisely known. One thing is known, however, which may properly be stated here, and that is, the peculiar excitement called the *sexual feeling, is not necessary to impregnation!* I have known females who never experienced the sexual feeling, and yet bore children. It is true, nevertheless, that this feeling is experienced in most cases, and further *it ought to be so always.* Its absence is very frequently attended with barrenness, though not always, and it is rarely accompanied by good health and spirits.

Let us adopt whichever view we

may, as to the precise *manner* of impregnation, its effects still remain the same. Immediately after it has occurred certain changes begin to take place by which the impregnated egg is brought into the womb, and eventually developed into a perfect human being. These changes will be explained under the head of *Fœtal Development!*

As a general rule we find that one act of impregnation affects a determinate number of eggs, which are all developed at once. In some cases, however, we see that one impregnation will affect an indefinite number, which may be developed in succession, as with the common fowl. In some insects the female merely requires impregnating at the commencement of the spring, and that one act will fecundate all the eggs she may lay that season. In many of those that have no wings, not only will these eggs bring forth perfect beings, but these new beings also can bring forth eggs

fully fecundated, without any other sexual connexion, and their young the same, and so on *for nine successive generations!* The impregnating principle being transmitted, as it were, from one female to another, through all these developments. This accounts for the extraordinary speed with which many of these animals multiply themselves.

In plants the act of impregnation is essentially the same as in animals, and accomplished in nearly the same manner. If we take a flower, as that of the lily, and analyze it, this will be very evident. Within the *corolla*, or what is commonly termed the *flower*, are six thread-like organs, disposed in a circle. These are called the *stamens*, or *male organs!* Each thread is called a *filament*, and is surmounted by a small protuberance called an *anther*, which contains a fine powder, or dust, called the *pollen*, which is analogous to the *semen* of the male animal. In the centre of the corolla, surrounded

PLATE 7, p. 72.

GENERATIVE ORGANS OF PLANTS.

Analysis of the Flower of the White Lily, to show the Organs of Generation in a plant.

a–a—The Petals, or colored Leaves.

b—The Stamens, or male Organs.

c—The Pistil, or female Organ.

d—The filaments, or threads of the Stamens.

e—The Anthers, or heads of the Stamens.

f—The Stile, or Thread of the Pistil.

g—The Stigma, or head of the Pistil.

h—The Gerin, or rudiments of the seeds, answering to the Ovary in an Animal.

The Pollen, (or semen) is formed on the Anthers; is shed on to the Stigma, and passes down the stile, (or Fallopian Tube) and so reaches the Germ, (or Ovary.)

Pl. 7.

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by the stamens, is another similar looking organ, but much stronger and longer, called the *pistil*, or *female organ!* The thread of this is called the *style*, and the top the *stigma!* The bottom of the pistil grows upon another organ called the *germ*, which is the same thing as the *ovary* in a female animal! The *eggs* from which young animals are formed come from the *ovary*, and the *seeds* from which young plants are formed come from the *germ!* When the flower is fully developed the pollen from the anther is scattered upon the stigma, from thence passes down the tube of the pistil, and so reaches the germ, which it impregnates. Exactly the same as the semen, when deposited in the vagina, traverses along the fallopian tube to reach the ovary. The hollow pistil in the flower performing the same part as the fallopian tube in the animal. When the rudiments of the seeds are thus impregnated they begin to perfect themselves, and, when fully

ripe, will grow into new plants. But if they are not thus impregnated, by contact of the male pollen, they can no more be made to germinate, or grow, than eggs can be developed into new animals without being fecundated by the male semen. Numbers of experiments may be easily made to prove these facts, but they are so well known that it is scarcely necessary. Perhaps as good an illustration as could be given is that of the common *Indian Corn*. In this plant the male and female organs are not placed together. The male organs constitute the blossom, or flower, which grows at the top. When ripe a quantity of fine white dust falls from the flower, which is the pollen. The female organs constitute what is called the *cob*, or head of corn. These consist of the germs, or rudiments of the seed, and a number of long filaments, called the silk, proceeding from them. When the pollen is thrown from the flower it falls upon the filaments, or silk, which are so

many *fallopian tubes*, and by them is conveyed to the seed, which thus becomes impregnated. If one of these plants be taken and the flower cut off, so that no pollen is formed, and care be had that none is brought from other plants, the seeds formed cannot be made to germinate or grow, tnough they will not appear very different from others that will. They lack, however, the male principle, and are precisely like the eggs of a chicken which has not had connexion with the male bird.

Pollen is an interesting object of study with the miscroscope. To the naked eye it merely appears like fine dust, but when examined with that instrument each grain is found to possess a determinate form, which varies in different plants, being sometimes curious, fantastic, or beautiful.

Some plants are Hermaphrodite, or have the male and female principles united in the same flower, as in the lily; some have them in separate

flowers; and others even have them in separate plants. This last is the same arrangement as is found in the more perfect animals. Such plants are called *diœcius*, and if they are not planted near together, so that the pollen can be carried to the female flowers, they will be unproductive. Many curious arrangements are to be found for ensuring this union. It is blown by the wind, carried by Bees, or other insects, and sometimes it is taken by the gardener himself.

In the "*Aristolochia Clematis*," the two principles are so placed that they could not possibly come together by any of the ordinary means. There is, however, a little insect, the *Tipula Penicornis*, which enters the flower in search of honey, and by rummaging about during its search consummates the act of impregnation, by shedding the pollen upon the germ.

The colors and forms of flowers are much altered, by the pollen of one being communicated to the germ of another.

PLATE 8, p. 77.

PREGNANT UTERUS.

A Lateral Section of the Uterus, between the second and third month of Pregnancy.

No. 1-1-1.—The Walls of the Uterus. No. 2.—The Vagina. No. 3.—The membrane called the *Decidua*, which lines the Cavity of the Uterus from the very commencement of Pregnancy. The decidua is reflected, or doubled, the two folds being connected by the dotted line. No. 4.—The membrane called the *Chorion*, which is seen to be covered with Villosities, or little blood vessels, like hairs.

No. 5.—The membrane called the *Amnion*. This contains the fluid called the waters of the Amnion, in which the fœtus seems to swim. No. 6.—The Fœtus. No. 7.—The Placenta, or mass of Bloodvessels which receives the blood from the Uterus; it is seen full of vessels, like roots. No. 8.—The Umbilical cord, or Navel String. One end of this is connected with the Fœtus, and the other with the Placenta. The blood flows down it from the mother to the child. No. 9-9.—The ends of the Fallopian Tubes, cut off.

FIGURE 2.

An Ovum of about *twelve days* after impregnation; natural size. No. 1.—The Embryo. 2.—The Vesicle, or Vitellus. The Embryo and Vitellus are seen to be connected by a cord. 3.—The Amnion. 4.—The Chorion.

FIGURE 3.

An Ovum of about *twenty days*, natural size. Numbers and references same as for Fig. 2.

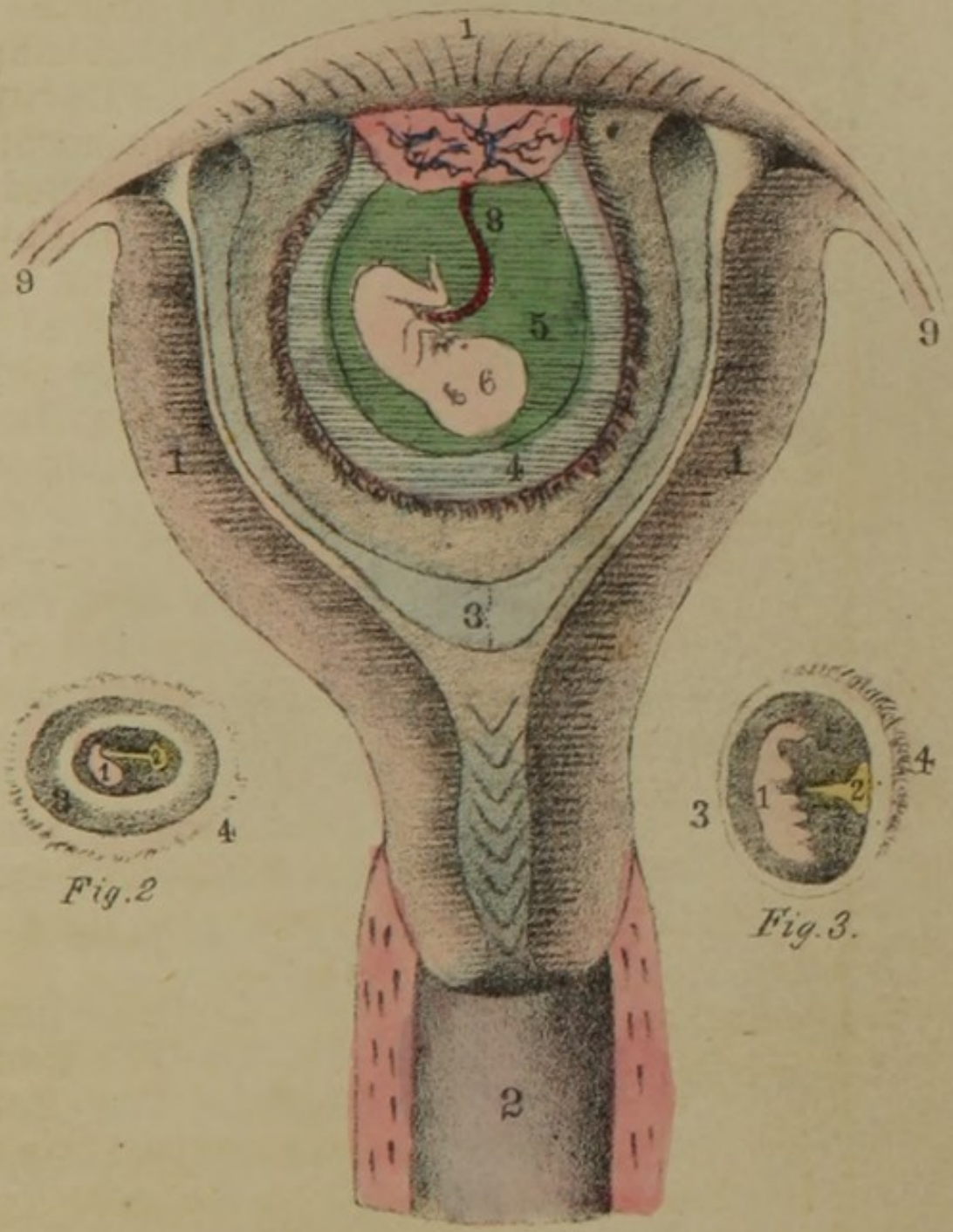

Fig. 2

Fig. 3.

Fig. 1.

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PHYSIOLOGY OF GENERATION

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FŒTAL DEVELOPMENT.

CIRCUMSTANCES do not allow us to trace the development of the new being at every instant of its progress. We have only observed the wonderful process at intervals, far between, and uncertain as to their precise chronology. Sufficient is known, however, with certainty, to enable us to give a tolerably correct explanation of the phenomena. Immediately after an egg is impregnated in the ovary of the hu-

man female, it begins to enlarge, becomes more transparent, and darker in its color. About the seventh day it has so much expanded as to burst through the membrane which surrounds the ova, and so becomes disengaged. At the same time the fimbriæ, or fingers, at the end of the fallopian tube are brought in contact with and clasp round it, so as to enclose it in their embrace. By these means it is brought into the open end of the tube, down which it begins to make its way, the passage enlarging for the purpose. In about two or three days it travels the whole length of the tube, and from its other open extremity passes into the cavity of the uterus. The egg, therefore, does not reach the womb till about nine or ten days after its impregnation. At that time all the primordial parts of the fœtus are contained in it, but in such a minute and transparent state that they can scarcely be distinguished. It is surrounded by two membra-

nous coverings, the outer one called the *chorion*, and the inner one the *amnion*. Between these is a gelatinous substance, and within the amnion is a fluid, called the liquor amnii. The two membranes, the liquor amnii, and the inclosed ovum, are called the *ovulum!* Immediately after conception the uterus begins to secrete, from its inner walls, another membrane, very delicate, called the *decidua*. This lines the whole cavity, so that when the ovulum passes out of the tube it is met by this lining which seems to prevent its entrance into the womb. The ovulum, however, presses upon it and so makes a depression, like a nest, in which it lies. This prevents its moving about, or falling to the bottom of the womb.

At the twelfth day the ovum is about the size of a large pea, it is composed of a vesicle containing a thick fluid, called the *germ*, which corresponds to the opaque substance seen in the white of a fecundated birds' egg, and of a

yellowish substance, floating in it, called the *vitellus*, which answers to the yolk. The whole being surrounded by the amnion and chorion, and resting in the depression of the decidua, close by the entrance to the tube, down which it came. The weight of the entire ovulum is about one grain. The embryo commences in the germ, and may now be seen about the size of a pins' point. The vitellus removes away from it, but remains connected by a small pedicel or thread-like tube, down which it is gradually absorbed as nutriment. A small white thread, scarcely perceptible, may be seen sometimes as early as this period, being the commencement of the brain and spinal marrow. The mouth is visible also from the twelfth to the twentieth day, and frequently the eyes. These are placed at first on the side of the head, like those of quadrupeds, and move round to the front afterwards.

At twenty-five days, the embryo is

about the size of a large ant, which it also resembles in form. It begins to have a little more consistence, and the future bones begin to resemble cartilage, or gristle. A small groove may be seen denoting the neck, which thus indicates the separation of the head from the trunk. The weight is three or four grains.

The first month, it is about the size of a Bee, and is somewhat like a small worm bent together. The arms may be seen like two little warts. They are first formed under the skin, and shoot out like buds, growing straight from the body; afterwards they become folded together, in a curious manner, upon the breast. The head is as large as the rest of the body, and upon it we can now see distinctly the eyes, like two black dots, the mouth, like a line, and also the nose. The lower extremity is lengthened out like a tail. Weight about ten grains.

The second month. Every part has now become much more developed.

And the general form is that of a human being. The superior members are much more elongated, and the inferior ones begin to be distinguished, forming in the same manner as the others. The fingers are united together by a membrane, like the web on a Frogs' foot. In the ribs, clavicles, and jaw bones, a few points can be seen ossified, the cartilage beginning to harden into bone. The rudiments of the first teeth are also visible. The weight is about one drachm, and the length one inch.

At about seventy days the eyelids are visible, the nose becomes prominent, the mouth enlarges, and the external ear may be seen. The neck is well defined. The brain is soft and pulpy, and the heart is perfectly developed.

Every organ is originally formed without either blood or blood vessels. The circulation which afterward takes place in them is merely for their subsequent development. The heart is

perfect in all its parts, and even has a slight motion, before the blood reaches it.

Three months. All the essential parts are well defined. The eyelids distinct, but firmly closed. The lips perfect, but drawn tightly together. The heart beats forcibly, and in the larger vessels red blood is seen. The fingers and toes are defined, and the muscles begin to be apparent. The organs of generation are remarkably prominent. In the male the penis, and in the female the clitoris, are exceedingly large. It is somewhat difficult, at first, to distinguish the sex by these organs, notwithstanding their development, as the penis and clitoris are nearly identical in form. It can, however, be ascertained by other circumstances, as the form of the head, dorsal spine, thorax, and abdomen. It now weighs about two ounces and a half, and measures four or five inches in length.

Four months. The development is

remarkably increased. The brain and spinal marrow becomes firmer, the muscles distinct, and a little cellular tissue is formed. The abdomen is fully covered in and the intestines are no longer visible. A little of the substance called *meconium* even collects in the intestines, the same as is found in at birth. It now weighs seven or eight ounces, and measures six or seven inches. The bones are ossified in a great part of their extent, and the rudiments of the second set of teeth are visible, under the first.

The uterus now is so large that it can no longer remain in the lower part of the pelvis, but is compelled to rise up into the abdomen for more room. This change of position is improperly called *quickening!* Sometimes it takes place very gradually, so that it is scarcely noticed, but more frequently it rises suddenly, disturbing all the internal organs, and causing them considerable derangement till they accommodate themselves to the change

This occurrence often causes unnecessary alarm, though the sickness, and other unpleasant sensations, are always sufficiently annoying.

This stage corresponds with that in which the young of oviparous animals breaks the shell and escapes. The human being, however, undergoes a remarkable change, and remains in the womb for a period longer than that already past, in order to become more perfected.

Up to this time the fœtus has not received blood directly from the mother, but has been nourished by other means. At this time, however, a great change occurs; its heart beats, the mother's blood is admitted to it, circulates in its vessels, and ministers to its support.

From four to nine months the development is proportionably much more rapid than during the first four months, owing to the circulation of proper blood.

Five months. Every part is consid-

erably increased in size, and become more perfect. The lungs enlarge, and are even capable of being, to a certain extent, dilated. The skin becomes much stronger. The situation of the nails can be discerned. The meconium is more abundant, and lower down in the intestines. The length is now eight or ten inches, and the weight fifteen or sixteen ounces.

Six months. The nails are marked. The head becomes downy, from the first development of the hair. A little fat is formed. Length twelve inches, weight from one and a half to two pounds. No indications of intellectual faculties.

Seven months. The whole being has rapidly progressed. The nails are formed, the hair is perfect, in the male the testicles descend to the scrotum, and in the female the ovaries reach the brim of the pelvis. The bones are tolerably firm, and the meconium collects in the large intestines. Length fourteen inches, weight about

PLATE 9. p. 87.

FŒTUS AT FULL TERM.

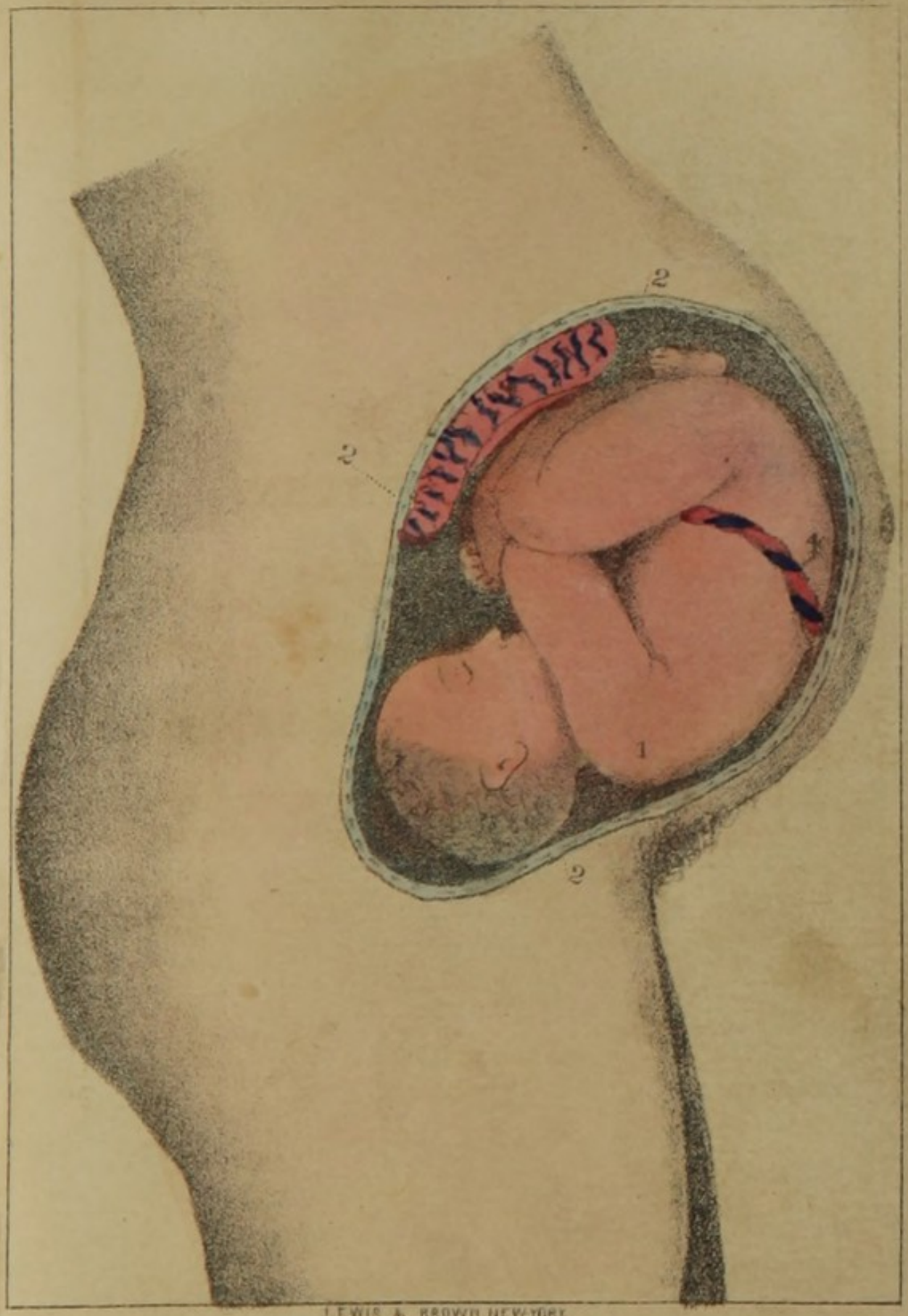
This is intended to represent the position of the Fœtus in the mother's body, at the full period of Gestation, and just before Parturition.

No. 1.—The Fœtus.

No. 2–2–2.—The cut edges of the Womb.

No. 3.—The Placenta.

No. 4.—The Umbilical Cord, wound round the body, and communicating with the Placenta underneath.



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three pounds. Intellectual functions not yet exercised.

The two remaining months are merely devoted to further increase in size and weight. No new phenomena present themselves.

Nine months. Every function has become active. The skin becomes colored, and perspiration occurs. There are no indications of the intellectual functions, but the animal functions are remarkably active, particularly that of *taste*, which no doubt leads to the act of suckling, from the natural desire for its gratification. The child can now experience all the ordinary sensations of pain, hunger, heat, and cold. The weight is from five to eight pounds, length from eighteen to twenty-two inches. It must be remarked, however, that the development varies much in different subjects. Neither the size, weight, nor state of perfection, here stated must be considered as the standard for every case. It is intended merely as an approximation, and

probably is near the average. The largest I have seen, weighed fourteen pounds. The smallest, at full term, three pounds.

At birth the navel marks the exact centre of the body, but the further we go back towards its commencement the shorter we find the part below the navel in proportion to that above.

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FŒTAL NUTRITION.

THE manner in which the fœtus is nourished is different, at the two different periods of its development, as already stated. At no time does it make *blood*, or any analagous substance, from foreign matter, by which to nourish itself, as it does afterwards in the adult state. The stomach digests no food, nor do the lungs inspire air, neither process being needed, nor possible. The blood vessels circulate blood, during the last five months, but

that blood is *made* by the nutritive organs of the mother, from her food, propelled into the vessels of the child by her heart, the same as into her own, and finally reaches her lungs to be again renovated when it has become impure! The child is, therefore, in point of fact, when in the womb, *a part of the mother's body*, receiving blood from her heart the same as her head, or arm, and no more requires a separate digestion or respiration than either of these organs.

The embryo commences, as previously stated, with that part of the egg called the germ! And is connected, by a small tube, with the *vitellus*, or yellow portion, which is gradually absorbed down this tube and so supplies the matter required for nourishment. A fresh portion of vitellus is continually forming as fast as it is absorbed, so that the supply is always adequate to the demand. It is formed, like every other substance in the body, from the blood, which may therefore

be considered as undergoing a preparatory change, by being converted into this material. At first the vitellus forms the great bulk of the ovum, but gradually becomes less and less, as the fœtus enlarges, till about the fourth month it disappears, being no longer wanted. The vessels are now perfect enough to circulate true blood, which therefore is admitted into them, by the following means.

From the earliest period of gestation, the middle membrane, called the chorion, is covered, on its outer surface, with a number of small protuberances called *villosities*, which subsequently become true blood vessels. About the fourth month these have increased very much in size and number, and have all become conglomerated into one mass, in form like a mushroom. This is called the *placenta!* It is almost entirely formed of blood vessels, which seem to attach themselves at one end, by open mouths, to the open mouths of other blood vessels on the

inner walls of the uterus. At the other end these vessels are drawn together and lengthened out into a long tube, called the *umbilical cord*, or *navel string*, which finally enters the body of the child at the navel and so establishes the connexion between it and the mother.

The blood vessels in the placenta, umbilicus, and fœtus, like those in the maternal body are of two kinds. *Arteries* and *veins!* The arteries, which come from the *left* side of the heart, carry the pure blood, which contains all the materials for forming and nourishing every part of the system. The veins contain the blood in its impure state, and take it to the *right* side of the heart, from whence it is forced into the lungs to be purified by the act of breathing. The blood is made impure by some of its constituents being absorbed, to form the different parts of the body, and by having thrown n to it a quantity of waste and poisonous matter no longer needed.

The course of the blood, therefore, is from the left side of the mother's heart along her arteries till it reaches the arteries of the uterus, from them it passes into those of the placenta, and thence into those of the umbilicus which convey it into the body of the child. When there it circulates in its arteries, supplies the material for its further increase and development, becomes in consequence impure, and passes into its veins, the same as in the maternal body. From these veins it passes into those of the umbilicus and placenta, and so reaches those of the mother, by which it is conveyed to the right side of her heart, and by its action to her lungs to be again purified when she breathes. This explains what was previously stated, that the child used the mother's heart, lungs, and stomach, while in the womb, and has, therefore, no occasion to use its own.

The diameter of the placenta is about six inches, and its thickness

about one inch and a half. The length of the umbilical cord is from eighteen to twenty-four inches, its diameter about half an inch. These dimensions are, however, subject to great variation. Instances are mentioned of the cord being five feet long, and as thick as the child's arm. I have seen one myself four feet long. Sometimes it will be very short, not more than eight or ten inches. It is composed of one artery and two veins, twisted together like the strands of a cable, and of a sheath surrounding them composed of the chorion and amnion. Between the sheath and the vessels is a thick gelatinous fluid called the Gelatine of Wharton.

Peculiarities of Fœtal Circulation.

From the circumstance of the fœtus not using its heart and lungs, like the adult, its circulation has several modifications.

The engine by which the blood is

forced along its vessels is the *heart!* This is divided into two distinct parts, each of which has two cavities, the upper one called the *auricle*, and the lower one the *ventricle*, which communicate with each other by curious valves. In the adult the whole of the impure blood is poured into the right auricle, that from the lower part of the body by the *inferior vena cava*, and that from the upper part by the *superior vena cava*. From the right auricle it passes into the right ventricle, which pumps it into the lungs, by way of the pulmonary artery; here it is purified by the act of respiration, and then brought, when pure, by the pulmonary veins, into the left auricle, and passes from thence into the left ventricle, which pumps it into the great aorta, and from thence into the smaller arteries all over the body. The two sides of the heart, therefore, do not communicate directly with each other, but there is a strong partition between them. In the

fœtus the arterial blood from the mother, when it leaves the umbilical artery, enters first the liver, runs through its vessels, gives off the bile found in it, and then joins the vena cava inferior. By this passage it is taken into the right auricle, along with the impure blood of the vena cava. From the right auricle it passes through a hole in the partition directly into the left auricle, instead of taking the indirect route by the lungs as in the adult. From the left auricle it passes into the left ventricle, and is from thence distributed by the arteries all over the body. This opening in the partition is called the *foramen ovale!*

After birth, when the blood begins to pass through the lungs, this passage closes up. By the eighth day it is generally obliterated, often much sooner, though occasionally it has remained open longer without inconvenience. In some cases the faramen ovale does not close at all. The child then has what is called the *blue disease!* The

whole body is of a uniform leaden, or blue color, and the whole system is generally languid and sluggish. The blue color is caused by the dark blood of the veins mixing with that of the arteries. These children mostly die early, but some live to be five or six years old, and one I saw twelve, but this is rare. No remedy can be had for this affliction, and I have never known it to cure spontaneously. Some children are so very dark for a few days after birth as to cause great alarm. This is owing to the foramen ovale being very open and closing slowly. No apprehension need be experienced in such cases, as it soon subsides.

The impure blood from the upper part of the fœtal body, which is brought down by the superior vena cava, also enters the right auricle, but does not pass from thence through the foramen, like that from the inferior vena cava. By a peculiar arrangement this blood is made to pass down into the right

ventricle, and from thence along the pulmonary artery, the same as in the adult state. Only a very small portion, however, passes into the lungs, the great part being taken along a tube called the *ductus arteriosus* into the great artery called the aorta, where it begins to turn down to the lower part of the body. In consequence of this, the arterial blood going down to the lower part of the body, is mixed with this portion of impure, venous blood, brought by the ductus arteriosus from the superior vena cava; while that going to the head, and upper part of the body remains pure. And this is the reason why the lower part is always so much smaller than the upper part, previous to birth; it receives less pure nourishment. The head and chest appear, at an early period, almost as large as the rest of the body.

This circumstance also explains why, in the great majority of cases, the *right* arm is preferred to the *left*,

and has more real power. The place where the ductus arteriosus pours the impure blood into the aorta, is almost immediately opposite to where the artery is given off which feeds the left arm. In consequence of which, in most cases, a small portion of this impure blood becomes mixed with the arterial blood, and the left arm is, therefore, in the same situation as the lower limbs, and like them is comparitively imperfectly developed. The right arm is not liable to any such deprivation. In some cases the insertion of the ductus arteriosus is lower down, so that no such mixture occurs. Both arms are then equal, and this accounts for the fact that in some persons there appears to be no difference. In some cases, no doubt, early habit, or imitation, may overcome this natural inferiority, and even give the preference to the left arm; but such instances are rare; the general rule is the contrary, and for the reason stated.

The ductus arteriosus closes up

about the same time as the foramen ovale.

The two veins which convey the impure blood back to the mother, to be purified, originate from the iliac artery, in the pelvis. They pass up the sides of the bladder towards the navel, enter the sheath of the cord and so reach the placenta. These vessels are obliterated about the third or fourth day after birth, and remain afterwards in the form of a fibrous cord.

This explanation of fœtal nutrition is the only one in accordance with fact and reason, though others have been advanced. It has been conjectured that the liquor amnii might nourish the fœtus, either by being swallowed and digested, or by being absorbed through the skin. We know, however, that the mouth of the fœtus is always firmly closed; and the theory of cutaneous absorption is entirely unsupported. It has also been supposed that the arterial blood underwent a great alteration in the placenta, and that the re-

turned venous blood was purified there, instead of entering the veins of the mother. It is true that the blood of the fœtus is often found to differ from that of the mother in its composition, but what causes the difference is unknown. There is no evidence whatever that the fœtal veins terminate in the placenta, but on the contrary it appears certain that they are continuous with those of the maternal body.

It must be remarked, however, that though this explanation is probably true, as a general rule, yet still we sometimes find curious exceptions, which we are unable to explain. Thus instances have been known of a fœtus being found alive, and well developed, in the womb, that has *never had any connexion, by a placenta and cord, with the mother at all!* These merely floated loose in the liquor amnii, and by what means they were nourished we cannot even imagine.

The chief circumstance which favors the notion that the fœtus in utero

really digests, is the presence of the *meconium!* This is a greenish substance, like excrement, found in the intestines at birth, and even for some time previous. It is sometimes mixed with hair. Whence this substance is derived I cannot say, most probably from the liver. It has been found in children born without heads, or with the mouth grown up, so that it could not come from anything swallowed.

Period when the Fœtus can live.

The precise period at which the fœtus may live, if it be brought into the world is not fixed. This depends upon the degree of its development, and not on the time it may have been in the womb. One may be as fully developed at six, as another at seven months. The common opinion is that the child cannot live if born before *seven months.* This, however, is incorrect. Many instances have been known of births at six months, and

even earlier, in which the child lived, and became strong and healthy. Van Swieten mentions the case of one Fortunio Liceti, who was born before the sixth month. He was not larger than the hand, but grew to the average size, and lived to be seventy-one years old. Dr. Gunning Bedford mentions a similar case, in his translation of Chally's Midwifery. There are even cases mentioned of children living at five months, but it must be borne in mind that it is seldom possible to determine the exact period. As a general rule, however, the child does not live till after the seventh month, though there undoubtedly have been cases where it has lived before the end of the sixth month. The law adopts the medium period and declares the child capable of living at *the end of the sixth month*, and not before. There is no reason whatever for supposing that it is less likely to live at eight months than at seven, or that it will not live at all at eight months.

Duration of Pregnancy.

The ordinary period of gestation is from thirty-nine to forty weeks, or about nine months. We have seen, however, that it may be much shorter and yet the fœtus live. It may also be extended much further without inconvenience or bad result. Some females will gestate for ten months, or more. I believe the French law allows the possibility of three hundred days, or ten months and a half. What causes these differences we do not know.

When the full period of gestation has arrived, certain phenomena begin to be exhibited which indicate the commencement of

Parturition.

This is a spontaneous effort of nature, by which the fœtus, when fully developed, is expelled from the womb

to live externally as an independent being. It is analagous to the effort by which a tree casts off its fruit when fully ripe.

In speaking of the uterus we alluded to the extraordinary enlargement it underwent during pregnancy, and to the astonishing power of contraction which it possessed. This contractile power is the immediate cause of the expulsion of the fœtus. The mouth of the uterus, vagina, and external parts become gradually relaxed as the female advances to full term, so that the fœtus can pass through without rupturing them. An abundant secretion of mucus occurs, to lubricate the parts, and keep down inflamation, and thus the grand event is prepared for. The uterus then begins to contract, causing the labor pains; the mouth opens and the membranes which envelop the fœtus, and contain the water, protrude through like a bag, which at last is broken by the continued pressure, and the water,

or liquor amnii, escapes. The walls of the uterus having nothing now to keep them in a distended state apply themselves close on the body of the child, contract with redoubled force, and at last force it through the mouth into the vagina, from which it quickly emerges through the external orifice. The uterus soon after begins to contract again and soon returns to nearly its original size. A discharge, at first bloody, afterwards whitish, called the *lochia*, occurs for some time, and when that ceases everything returns to its natural state. The average duration of labor, in natural birth, is from four to six hours, and in the great majority of cases the head presents and is delivered first. This being the most favorable arrangement.

The bones through which the child passes are formed into a circle; the bones of the pubes in front, the lower part of the back bone, called the sacrum, behind, and the wide bones, commonly called the hip bones, on the

sides. The space between the top of the sacrum and the pubes is called the upper strait, and that between the lower end of the sacrum and the pubes is called the lower strait of the pelvis. The size of these straits is usually adapted to the size of the fœtus, so that in nearly every case, where the body is properly formed, and well developed, it passes without any great difficulty.

The reason why so many females suffer so much in Childbirth, or die in consequence, is undoubtedly owing to the deformities and diseases, brought on by the circumstances of our own artificial and ignorant state of society. These evils will continue so long as ignorance is preferred to knowledge, and all that we can do before society becomes enlightened is, to palliate them as well as we can. There are many habits, and modes of dress, that contribute a large proportion to these evils. Particularly the odious one of wearing corsets, which no doubt originates full one half of all the suffer-

ing and death that now occurs during parturition. And this barbarous fashion springs from a mistaken idea that the human figure, in its natural form, *is imperfect*, and that it is necessary to "*improve*" it! What folly, and what lamentable ignorance this displays. Any one capable of judging, who is at all acquainted with the exquisite proportions, and admirable adaptations, of the perfect human structure, is struck with their beauty, and must be deeply pained to see the fantastic specimens of deformity, called "*fashionable shapes!*" I leave it for religious people to decide how near it comes to *blasphemy*, to say, as many do, in practice, that the Creator made the human body so very imperfect that it wants "*improving!*"

A notion prevails, somewhat extensively, that the bones of the pelvis *separate*, at the time of parturition, to allow the child to pass through. This is a mistake; a slight inspection of this part of the skeleton would show that

such separation is neither possible nor desirable, and that it would not be of service. The only bone which gives way, generally, is the small one terminating the back bone, called the *Os Coccygis!* This is often broken from the others, but seldom produces any serious result by so doing.

The After Birth.

In our account of the development of the fœtus we stated that it was surrounded, while in the womb, by three envelopes or coverings. The inner one, called the *amnion*, containing the liquor amnii; the middle one called the *chorion*, and the outer one, called the *decidua!* The placenta, and umbilical cord, connecting it with the mother for the purpose of nutrition. When the child passes into the world it has to burst through these membranes, and of course leaves them in the womb. It is then connected with the mother by the cord, one end of

which is attached to its navel, and the other to the placenta, still growing to the walls of the uterus. The Midwife cuts through this cord and so liberates the child. The membranes, the placenta, and greater part of the cord remain in the womb, and have to be ejected afterwards, they are, therefore, called the *After Birth!* The expulsion of the After Birth usually takes place about half an hour after that of the fœtus, though it will sometimes remain much longer, several days even, without bad result. It is, however, customary for the accoucheur to remove it, if it does not come spontaneously in a short time.

In some rare cases the membranes unbroken, containing the child and the water, will come away entire.

The child will sometimes be born with a membrane covering its face and head, or even its whole body, as closely as a glove covers the hand. This membrane is called,

The Caul; or, Veil.

The superstitious have imagined many virtues to belong, to both the veil and the child born with it. This membrane is, probably, merely a portion of the amnion reflected over the head, or entangled upon it during its exit. In ordinary cases the membranes all come with the After Birth, but in these a small portion comes with the child. I do not think there is anything more in the one case than in the other. In some parts of the world the child so born is thought to be "*lucky!*" In the Highlands of Scotland it is said to possess the gift of *second sight!* And in this country even, there are people who think they can tell fortunes, and inform persons where stolen goods are taken to. There was an old woman in London City, some little time ago, who became very famous this way. Her success was undoubted, and I once asked a friend of mine connected

with the police how he accounted for it. Said he, "I was a long time quite puzzled with her, for she told me while disguised, many things of the kind which I could find out by no other means. I however discovered subsequently that she was privately connected with nearly every gang of thieves in the city, and thus her knowledge was accounted for!" I have no doubt but that many similar cases could be explained in this way. I have, myself, met with several of these favored people, but never yet found one that could see further into a mill stone than any ordinary mortal! The Caul itself is said to preserve the possessor against poverty, fire, water, and sudden death. The belief that it can preserve against water is, perhaps, the most general. And, on that account is has always been popular among sea-faring men. I have frequently known them sold, in England, for fifty or a hundred pounds, when properly authenticated. In the Lon-

don Times, about ten months ago, was an advertisement stating where one could be had at a certain place, and that to prevent trouble the price *was fixed at sixty guineas!* I once met with a sea captain, a very intelligent man, too, who firmly believed that nothing but a Caul which he possessed had preserved him through his stormy perils. "I was once," said he, "*in a sinking condition*, and nothing saved me but the Caul which I *tied to the mast!*" I presume most captains would rather trust to a sound ship, and good weather. A boy was once picked out of the River Thames, by London, drowned, with a Caul, sewn up in a bag, *hung round his neck, to keep him safe!* A short time ago I assisted at the birth of a child whose head was covered with one of these veils, which nearly caused its death. Being busy with the mother I did not see this covering at first, till the attendant found it could not breathe. I then removed it at once and the child

began immediately to cry. It is, therefore, always necessary to see if anything of the kind exists.

In cases of compound pregnancy each fœtus has usually a separate amnion, and chorion, though not in all cases. One decidua surrounds them let the number be what it may. Sometimes twins will be expelled at once, but generally there is a short interval between; which may, however, be extended to days, or even weeks. Sometimes one will die, it is then either expelled, or remains after the other is born, in which case it may become exsiccated and remain in the uterus for a length of time. M. Chally mentions that he saw a fœtus of this kind in a woman who had not conceived for thirty years.

Miscarriage and Abortion.

From various causes the fœtus is liable to be prematurely expelled. If this occur before the seventh month

it is called *Miscarriage* or *Abortion.* After that period *premature* labor! This accident is most likely to occur about the tenth week, or third month, and is more frequent with male children than with females.

Pregnant females are now exposed to many causes of Miscarriage which might easily be avoided if they only knew more of their own structure, and the influence of external agents upon it. In many cases the disposition to such accidents is imparted in early life, and the evil remains unknown till it is too late to remedy it.

It would be foreign to the purpose of the present work to enter fully into the subject of Childbirth, Miscarriage, and other female affections, but as it is so important for all to be acquainted with these subjects, and as many now have sufficient good sense to wish for such knowledge, I intend, in a short time, to publish a work exclusively upon these topics.

PHYSIOLOGY OF GENERATION

IN THE

HUMAN SPECIES.

EXTRA UTERINE CONCEPTION.

SOMETIMES the egg is accidentally prevented from gaining the uterus, after it is fecundated. But so powerful is the impulse imparted to it by the semen that it will develop itself in any part where it may happen to be. In some cases it does not leave the ovary but remains and develops there. In other cases it will be taken into the tube, but not down its whole length, it will then form in the tube. I have two beautiful models representing ac-

tual cases of this kind. It may even be taken, by the motion of the body, after it becomes loose, to various parts of the pelvic, or abdominal cavities, where it will attach itself and develop in the same manner. In other cases it has been known to imbed itself in the walls of the womb, and develop there. Several instances of Extra Uterine Conception have come under my notice, and I have bestowed considerable attention upon them. The immediate cause, most probably, is a want of action, or stricture, in the fallopian tube; but what leads to that we cannot always say. Sometimes the development will be indefinite, having no resemblance to a human being; while at others it will be tolerably perfect, and attain a large size, as large in some instances as a fœtus of five months. It is always, however, a monstrosity, imperfect in some particular. The placenta and cord are found, as in the Inter Uterine Conception, as also the amnion and chorion,

but only occasionally a membrane analagous to the decidua, this being properly a product of the Uterus alone. The expulson of these products cannot of course be effected in the ordinary way, they have either to be removed by an operation, which is rarely resorted to, or else left to nature, in which case they may terminate in various ways. Some authors say they will occasionally be absorbed, and so disappear. More generally, however, labor pains come on at the ordinary time, decay commences, an abcess is formed, and the remains of the fœtus work through the opening. If she does not immediately succumb, the wound may then heal and the woman perfectly recover her health. Cases of this kind have often been met with. I remember one in which all the parts did not come away under six months; the head was nearly perfect. Sometimes the pains will return every nine months, for a long time, before decay commences. In other cases, instead

of decaying, the fœtus, with its appendages, will become callous, and form into a hard tumor, which may remain during the individuals life, without causing serious results. I saw a lady very recently who had carried one of these tumors for nine years! And I assisted at the dissection of another in whom it had existed for thirteen years. It was as large as the head, and fixed on the right side of the abdomen, apparently just underneath the skin. These accidents, though serious, are not necessarily always fatal. Females have been known to suffer from them several times in succession, though sometimes the next conception will be perfectly natural. Very generally, however, the first case is followed by barrenness.

Formation of one Child within another.

Fœtal development will sometimes occur under more extraordinary cir-

cumstances even, than those already mentioned. One fœtus may be contained within another. A case of this kind occurred at Verneuil, in France, in the year 1804. A child, named Bissien, who differed in no external particular from other children, but always complained of something being the matter in his left side. A small tumor appeared there early, but the development of his body and mind went on as usual, and nothing particular was noticed till he was thirteen years of age. The tumor then suddenly increased in size, he began to pass from his body a quantity of putrid matter mixed with long hair, fever set in and he died when about fourteen. Upon making a post mortem examination there was found, between the intestines and spine, the remains of a fœtus. The teeth, nails, hair, and bones, were not like those of a mere infant, but evidently indicated that the inclosed fœtus was as old as the one in whom it was formed! Such cases are extremely rare, and I

believe this was the first that was properly observed, or explained. Singular as it may appear, it can be readily explained, if the description we have given of the process, and organs, of generation be borne in mind. In examining the eggs of birds it is common to find some, called double eggs, that have *two germs!* These, if incubated, will develop two young, which may sometimes be separate, but more usually they are united in some part. In like manner one of the ova in this boy's mother must have possessed two germs instead of one. Both of these would of course be impregnated and begin to develop, but instead of remaining separate, one fœtus passed into the abdomen of the other, before it was covered in. Here its development slowly continued, both before birth and after, till the death of both ensued.—[Dictionaire des Sciences Médicales, vol., 34. p. 175.

Some speculative Physiologists have contended, from these and similar

facts, that an impregnated ovum might be developed *externally*, as well as internally, providing it was kept warm and moist, and had connexion with some blood vessel, from which to derive nutriment. This, however, it is not possible to determine.

These cases of Extra Uterine Conception effectually demolish the old absurd theory, that something passes from the ovary, at the time of connexion, to mix with the male semen in the uterus, and that the fœtus begins to form there in consequence. If this were the case it would be necessary to suppose, in these Extra Uterine Developments, that the fœtus was first formed in the uterus, and then, by some unexplainable process, and for no obvious purpose, taken to the outside, or fixed in the tube, where we find it. We may rest assured that no such absurdity exists in reality, though it may in the dreamings of some fact neglecting Theoriser. We know, besides, that the embryo is not to be

found in the uterus before the tenth day after conception.

The only discharge made by the female at the time of connexion is that of mucus, the same as is poured out of all mucus surfaces when execited. This is merely for the purpose of lubrication, and is no way essential to conception, or pleasure.

False Conceptions, Moles, &c.

A variety of abnormal productions are found in the uterus, called moles, and false conceptions, which are in no way connected with impregnation. Such as tumors, polypi, &c. The mole of generation is an abnormal development of the impregnated ovum. It has various forms, but most frequently resembles a mere shapeless mass of flesh, enclosed in an envelop full of fluid. On carefully dissecting this substance we can usually discover some traces of the fœtal structure; at other times we find nothing but the

bag of fluid. Sometimes the production will remain attached to the mother by a kind of cord and placenta, and develop into a shapeless monstrosity; at others it will be entirely disconnected. These growths probably originate from a blighted ovum, which retains sufficient life merely to develop, but not to organize. I have known them to attain a large size, and some females to have many of them in succession. What causes moles we do not know, nor can we always distinguish one from a natural pregnancy. Occasionally they assume the most fantastic shapes, and resemble the most incongruous objects. It is this circumstance no doubt, which gave rise to the statements we sometimes hear, and read of, in old works, of women bringing forth *animals*, *plants*, *&c.!* I have seen some moles, myself, which could be easily mistaken for such things, by persons who did not attentively examine them, and whose imaginations were a little lively. A kind

of imperfect Animacule, called the *Hydatid*, is also found in the uterus. It merely resembles a bag of jelly, and floats in a fluid. Its size varies from that of a pea to a chestnut. Sometimes only one is found, at others a number. When removed from the fluid in which they live and put in warm water they will often move, which shews them to be alive. Similar beings are formed in the liver and kidneys. Their origin is unknown.

Deformities, Monstrosities, and Marks.

Monstrosities. These anomalous productions, called also *lusus naturæ*, are of various kinds. They may either have more parts than natural, or less, or unnatural parts. Sometimes there is a confusion of parts only. Thus we sometimes have a fœtus with two heads, or an additional number of hands, or feet. And sometimes we have them with only one leg or arm. Then again we see others with super-

numerary parts that resemble no member in particular. And at other times we find some of the parts transposed, particularly the viscera. The causes of these accidents is not well understood. An opinion prevails very generally that they are altogether owing to some personal violence, or strong mental emotion experienced by the mother during pregnancy. Thus fright, sudden joy, or the sight of any disagreeable object, are thought to be able to produce them. In many cases this opinion is probably correct, so far as the mere fact is concerned, but some very absurd notions are entertained as to the manner in which these causes operate. I shall, therefore, endeavor to give a scientific explanation.

In our chapter on Fœtal Development we shewed that the different parts of the fœtus were formed in succession, each one at a particular period; and so invariable is this rule, that if any part be prevented from forming at the appropriate time, *it will not form*

at all! This explains to us at once the origin of those monstrosities, that exhibit deficiencies of certain parts. At the time when those parts should have developed, some disturbing cause deranged the principle of growth and prevented them from doing so. They, therefore, remained in abeyance while the other parts proceeded as usual. This accident frequently happens to the feet, hands, toes, and fingers, which may then often be found undeveloped under the skin. Sometimes to the roof of the mouth, or the lip, producing a deficient palate, or hare lip. In short, in almost every part.

The production of these monstrosities with redundancy of parts, as two heads to one trunk, or the reverse, three or four arms, or legs, or of two fœtusses more or less perfect, united at the front or back, must be explained in a different manner. In the chapter on Extra Uterine Pregnancy we stated that sometimes two germs were found in one egg, and we there gave the de-

tails of a case where both developed, and one became inclosed within the other. This, however, is a rare occurrence; generally these extra germs become attached, or grafted, as it were one upon the other, before their complete organization, thus producing the supernumerary heads, arms, legs, bodies, &c., which we occasionally see. It is also possible, in case of twins, that two perfect and distinct fœtusses may, by some means, come in contact before the skin is formed, and so adhere; as in the "*Siamese Twins.*" It may also be supposed possible for the growth of any part to be accelerated more than the others, instead of retarded, and thus produce deformity. Occasionally we see instances of six toes, or five fingers, &c., continued in a family for many generations, it is then called hereditary. What caused it at first, or why nature adheres to the imperfect type, we do not know.

That a vivid impression made upon the mind of the mother may *often*

cause these derangements is probably true, but it is wrong to suppose that they *always* do so.

If such were the case we should not be likely to find many children perfect, or, at least, monstrosities would be more frequent than they are. Besides we often find those who have been severely frightened, or who have seen the most disagreeable objects, bringing forth perfect children, while others who have never felt alarm, or dislike, produce monstrosities! And, further, we find monsters among brutes, who cannot be supposed much under the dominion of imagination. In plants also it is common to see a deformed growth from some disturbing cause. The fact is that most females experience some fright, or see something repugnant to them, while pregnant, and if they chance to bring forth a monstrosity, they at once begin to think over these occurrences till they recollect one, more plausible than the others, to which they ascribe it; if the child

be perfect, however, the circumstance is forgotten. In this, as in predictions, *failures are never noticed!* I have no doubt, however, but that the mother's imagination may, and does, in many cases, produce these results! Though not so invariably as is supposed. Disease in the father or mother, or malformation of her organs, may do the same. There are also, probably, other causes with which we are not yet acquainted.

The peculiar appearance called a *mother's mark*, is also supposed to be caused by the mother having *longed* for the object which it is thought to resemble. And since most pregnant females long for various things, and these marks are very indefinite in their appearance, it is no wonder that when one appears it is connected at once with one of the desired objects. I have seen many of these marks, but never yet met with one, that did not resemble any one of half a dozen different things, as well as another. And

in most cases, if two different persons were shown the same mark, without any previous intimation, they would probably each decide that it resembled a different object. There are plenty of marks without longing, and plenty of longing without marks. The "imagination" is no doubt concerned in these resemblances, but it is *after they are seen, not before!*

The color of these marks may be brown, yellow, red, blue, or black. Their organization indicates at once their real nature, and shews that they are the result of *disease!* A portion of the skin has become affected by some means, and produced the same effects as a bruise, or other injury. After birth they usually remain stationary, except one kind; these consist of a number of little round reddish spots, like the projections on a raspberry. They are mostly prominent, flatish, and connected with the skin by a little neck. And are caused by an obstruction of the ends of the little

blood vessels under the skin, which makes them enlarge and become engorged. They are precisely the same as what are called *Aneurisms*, or enlargements of the arteries. In some cases it is necessary to operate upon them, or they increase so as to be dangerous. Some marks are covered with hair, the same as moles, and are then thought to resemble *Mice*, and other animals.

How far, and in what way, can the Fœtus be influenced by external agency?

One of the most serious and important questions for the human race is, how far, and in what manner, can the child in the womb be affected, for good or for evil, by external circumstances? That it can be so affected has been already shewn, while speaking of monstrosities, and deformities, but there are other effects which may be produced by these causes, which, though not generally known, are of

still more consequence. That disease can be communicated directly from the mother to her child is notorious, many children having been born with the same disease upon them as their mothers were suffering from. And even from the father, there is good reason to suppose, disease may be communicated also. But this is rare; the greater number of children are born apparently healthy, though disease and suffering prevail so extensively in after life. What is the reason of this, are all the diseases contracted after birth produced entirely by causes then operating? I think not. And for the following reasons!

The internal organs may, undoubtedly, be affected in a similar manner to the external ones, and this fact is of the highest importance. *There is no doubt, on my own mind, but that the predisposition to disease, in most persons, is imparted in the womb!* We have seen how disease, or strong emotion, may either prevent the formation of

the external organs altogether, or make them *imperfect*, and there is every reason to suppose that the same causes may prevent the proper development of the internal organs also. And what follows from this? Why, if the *lungs* are imperfectly formed they will be liable to contract disease from various causes, which would not affect them if they were perfect. And so of the stomach, intestines, brain, and every other part. This shows us how important it is for pregnant females to avoid all mental and bodily agitation. It ought to be a matter of the most careful study, as to what circumstances are best suited for ensuring the health of the mother, and the perfect development of the child; but at the present time, though the greatest consideration is bestowed on this matter, *so far as the lower animals are concerned*, yet, when the human being is concerned, it is altogether a matter of chance, no care, or thought being bestowed upon it. The consequence of this criminal

neglect is, that many diseases are becoming daily more prevalent than formerly, and the whole race, in many respects, much deteriorated. The circumstances in which females are placed, in the present state of society, during gestation, are very frequently injurious. Some are over worked and some underworked; some are in continual mental agitation, while others exist almost in a state of torpor, worn out with the very weariness of mental inactivity. The whole system of the child is affected in consequence, it is imbecile, irritable and unstable in mind, and imperfectly formed in its body. Hence we have the present fearful liability to *consumption*, *dyspepsia*, and other complaints; the *tendency* to which, I have no doubt, is imparted while in the mother's womb, by the disturbing causes around her. Some of the Ancients were much more philosophic in relation to this matter. They were not so depraved, nor short sighted, like many of the present day,

as to think it wrong to understand such things, but on the contrary they made it a study, as all enlightened and truly moral people would do. Among the Greeks and Romans, we are told, a pregnant female was sacred; she was exempt from all improper labor, and no one was allowed, under penalty of punishment, to vex or disturb her in mind. To strike her was death. She had also many privileges, possessed by no one else. Thus if she met a criminal going to execution her word alone could pardon him. Some of the Greeks used to surround their women, while in this state, with pictures and statues representing the human figure in its most beautiful proportions, believing that these external representations would operate, through the mind of the mother, upon the child. For the same reason the Spartans took them to the battle field, that they might hear, and be influenced by the songs and triumph of the victors.

Some Physiologists have contended

that the peculiar frame of mind in which the parents are *at the moment of conception*, has a great influence upon the future child. And, though it is not easy to give a reason for it, yet still I am inclined to think such is the case to a certain extent. Many facts are recorded, and some I have seen myself, which favor this idea. Several idiots have been known to result from conceptions during intoxication; and possibly many an unfortunate slave of uncontrollable passions, owes his failings to the merely animal state of his parents when he was conceived.

It is true there is one circumstance which seems to throw a doubt on this theory, that the child may be influenced by the mental emotions of the mother. And that is, *no nervous connexion has been discovered between the two!* If we examine the umbilical cord we find there the blood vessels inclosed in their sheath, but *no nerve!* It is possible, however, that nerves may exist so small as to have escaped

notice. And, besides, we know sufficient of the nervous power to be aware that it will operate at some distance. Two bodies in different electrical conditions may affect each other without any direct connexion; and in the same manner the nervous system of the mother may affect that of the child, without any connecting cords, the blood, or the substance of the sheath, being a sufficient conductor. In fact, the nervous system of the mother and child, are similar to the two printing machines at the ends of a magnetic telegraph. In these if the operator print any sentence at one end, the other becomes simultaneously affected and prints a fac-similie. And, in the same manner, if any impression be made upon the mother, it is highly probable that a corresponding one will be made on the child in her womb, at the same time!

But even supposing that no nervous connexion exists at all, there is still another fact to be taken into consider-

ation which fully warrants all that has been said on this matter. And that is, *the ovum from which the fœtus first originates, and every particle of matter which it afterwards acquires during its growth, until the time when it leaves the womb, all are derived from the mother!* At the time it is born every atom of matter in its body has been taken from the maternal blood! - And this alone, it appears to me, makes it more than probable the child may be influenced through the mother. If the blood be impure, or if it do not contain the requisite materials, it is impossible for the body of the child to be made perfect from it. We might just as reasonably expect an artisan to turn out a good strong article from his workshop, when he had been supplied with bad material. And how many causes there are which tend to impoverish the blood, or make it impure. If the mother's health is not uniform the blood will differ in its quality at different periods, so that the different

parts of the fœtus will not be uniformly developed. Strong mental emotion will, we all know, accelerate or retard the circulation of the blood; and I have reason to believe will alter its quality also. A friend of mine once told me that he bled a person who was in danger of apoplexy, brought on by violent rage, and that the blood, when drawn, had precisely the same appearance that it has in a high fever! Now we should reasonably suppose that the blood, when diseased by the fever, would affect the formation of the child it was sent to; and I think it equally as reasonable to suppose that, if it be disturbed by a fit of rage, it will be equally prejudicial! Now there are few females who do not experience the most violent passions during pregnancy, and I have no doubt but that the formation, and future health, of their offspring suffers in consequence.

Another important reflection is, that the ovaries form a part of the original structure of a female child. They be-

ing formed at the very earliest period. Therefore, when a woman is pregnant with a female child, her blood not only forms the body of that child, but also the rudiments of the ovaries from which *its* children are to come! So that she may be said, in one respect, to originate her child and grandchild at the same time! Here we have three generations in one individual, and it is obvious from this how true is the maxim, that, *the sins of the parents are visited upon their offspring, even to the third and fourth generation!* The consequences of a single vicious act, in one individual, may afflict a great number of posterity for a great length of time. Mothers should know, therefore, how to attend to their own health and well being, both on their own account and on account of their descendants. It is suicide to neglect themselves, and something worse to neglect their children yet unborn.

The formation of the human fœtus, either perfect or imperfect, is regulated

by fixed laws, as certain as those which move the earth in its orbit! It is possible for us to ascertain many, at least, of these laws, and it is our duty to do so, in order that we may know how to insure to each child, at birth, a perfect mental and bodily organization. This will be the first real step toward a regeneration of society, and unless this step be taken all others will have but imperfect success!

Causes of the difference of Sex.

This is one of the mysteries of generation that we have not yet been able to explain. Facts have not been observed, nor experiments made, by which this point could be determined, we are, therefore, left almost entirely to theory. The most popular notion, and the one which appears at first sight most plausible, is that which supposes the sex to be imparted by, that one of the parents whose sexual feelings were the strongest at the time

of connexion; but still no reason can be given for this. I have, however, made as many enquiries as I could, in regard to this matter, and, judging from what I have heard, there seems some foundation for the supposition. It is probable that the sex is already established at the earliest period, possibly even in the germ. In the following chapter on the "*Theories of Generation*," it will be seen that some Physiologists imagine the new being to be derived from one of the seminal Animalculæ, and if so we may readily conceive that they are sexual, and that the sex of the Animalcule determines that of the future human being. This appears the most satisfactory theory of all. The opinion that males come from one ovary and females from the other, has been already shewn to be erroneous. And so also is that which supposes the semen of the right testicle to form one sex, and that from the left the other. The semen from both mixes together in the

seminal vesicles, and many men with but one testicle beget both boys and girls.

Nevertheless, though it is not possible to say what actually determines the sex, it does seem possible, sometimes, to cause a change, where one sex has been produced for a long time! I have given advice on this subject very frequently, and in many cases it has been followed with success. The instructions, however, vary so much for each individual case that it is not possible to enumerate them here. I was once applied to by a gentleman who had five daughters by a first wife, and he had already three by a second. He was exceedingly desirous for a son, and we consulted respecting it. I advised him to a certain course, which he pursued, and the result was as he desired. There is no certainty, however, in this, and nothing could be *promised* beforehand.

There are no means known by which the sex can be ascertained before birth,

at least none that are certain. Observation, however, has gathered some loose facts bearing on this matter, by which the prediction has been often made successfully; but these are of a nature to be disclosed only in consultation.

Sterility and Impotence.

A female may be barren from various causes, some known and others unknown. There may be some imperfection, or disease, in the vagina or uterus; the tubes may be imperforate, or the ova imperfect, or absent. In some of these cases assistance can be rendered, while others are irremediable. Sometimes the organs are all perfect, but do not act properly. This seems owing to a peculiar torpid state of that part of the system, which can often be removed by appropriate medical treatment. In treating these cases of sterility however, it should always be carefully ascertained, before resort-

ing to medicine, whether any defect exists in the organs themselves; for want of this care much mischief has been done.

In speaking of medicine, in relation to this infirmity, I wish to caution my readers against supposing, that there are any remedies which have a *certain* and *specific* action upon it. Many persons are deluded by the announcement of "Cordials," and other preparations, for removing sterility, which are but mere impositions. The only treatment likely to succeed, is that which first ascertains the cause, and if possible, removes it. In those cases which arise from inaction of the genitals, a general plan of treatment is mostly indicated, and not a local one.

Impotence in the male, may be caused by imperfect development, malformation, the want of semen, or by its being imperfect. Malformations are of various kinds, not necessary here to describe. The absence of semen may arise either from the loss of the testi-

cles, or from their being exhausted. Its imperfection may be caused by disease, or by excessive indulgence. Many malformations can be remedied, the power of the exhausted testicles often restored, and the semen again made capable of impregnation, but the loss of the testicles, it is evident, is irremediable.

Sometimes both parties will be perfect in every respect, and each capable with another partner, but yet they will be sterile with each other. This arises from some want of adaptation, either physical or moral, which can only be ascertained by consultation with both. In many cases I have known this to result from slight physical impediments, the removal of which at once removed the difficulty. Moral unfitness is more difficult to treat, but is often capable of adjustment. People who are too amorous, or too cold, are thought to be not apt to conceive. As also those who are too studious, or too plethoric. There are, however, so

many exceptions to these rules that they cannot be much relied upon.

I have already stated that the sexual feeling is not always necessary to impregnation, but I must also admit that the want of it is frequently a cause of sterility. I have known many cases in which fruitfulness has resulted from sexual excitement being produced, in one or the other who were previously indifferent. The means by which this excitement may be produced, or increased, cannot here be stated, as they vary so much in individual cases. Suffice it to say, that, when rightly used, they rarely fail.

It is often difficult to determine whether the fault is with the male or the female. But still it is necessary to do so, if possible, before any course of practice is resorted to. Females are found more often sterile then men, because they are more subject to diseases which destroy the tone of their organs.

In one hundred cases I have found

two to arise from organic defect in the male, and fifteen from organic defect in the female. Of the remaining eighty-three, fifty appeared to arise from the female, and nine from the male; the other twenty-three were cases of unfitness for each other, of which seventeen were adjusted. Of the whole number thirty two were cured.

This is a subject, however, which requires a much more extended notice, and in my other work I intend treating upon it fully. I am now collecting all the information upon it I can, and the cases constantly coming under my notice are very numerous.

PHYSIOLOGY OF GENERATION

IN THE

HUMAN SPECIES.

THEORIES OF GENERATION.

THERE are few subjects upon which Physiologists have less agreed, than the nature of the process by which the human being is evolved from the generative elements. Drelincourt collected *two hundred and sixty-two* different theories, which had been propounded by different writers, all of which he shows to be "groundless hypothesis," and he ends by proposing one of his own as groundless as the rest. The following are the principal ones, of

which all the others appear to be modifications.

Theory of the Spermatists. According to this theory the male semen is the essential element, from which all is formed, and the female ovum is merely the receptacle where it finds its appropriate nourishment. The semen here is regarded as the seed, and the ovum as the *soil.*

Theory of the Ovists. This is the very reverse of the other. According to this the ovum, or egg, is the real rudiment of the fœtus, and contains all the materials for its first formation. The male semen merely stimulating, or exciting it to action, as the warmth of the sun does the seed in the ground.

The Theory of Syngenesis supposes that certain products derived from both elements unite together, and by their combination produce the new being. One modification of this theory supposes that there exists in the generative organs a *formative substance,* which is capable, under appropriate

circumstances, of modifying itself, or undergoing a kind of *metamorphosis*. Another supposition is that there exists a number of *organic molecules*, which accumulate in the genital organs, and constitute the rudiments of the new being.

Theory of Evolution. This theory, like that of the ovists, supposes the fœtus to be solely derived from the mother. But it also supposes that it existed before sexual intercourse. That is, it supposes the rudiment, in the germ, to contain the fœtus with all its parts perfect, only on a small scale, and that this perfect rudiment always existed. The ordinary process of reproduction, therefore, according to this view, consists merely in the *evolution*, further development, or growth, of one of these germs into a perfect human being. The celebrated Haller even contended that these germs always existed, previous to their evolution, and that, therefore, the germs of all the human beings who are to be

born, already exist in the ovaries of our females. And consequently the first female must have contained the germs of all the human beings to come after. These rudiments were thought to be enclosed one within the other, like a nest of boxes, the outer one developing first.

Theory of Epigenesis. This theory is mainly based upon, and supported by, the facts which have been gathered from actual inspection of the fœtus at its different stages. It supposes that there is no such thing as a rudiment or germ pre-existing, but that the organs are all successively formed, and undergo various modifications before being fully developed. In the same manner as the different parts of a machine are formed from the raw material. Modern discoveries have gone far to make this view the most plausible.

It has been shewn that the human fœtus, at one period or other of its growth, is organized after the same

type as each of the lower classes of animals. So that from its commencement till its birth it goes through successive stages of development, representing the whole animal kingdom! At one period its circulatory apparatus is like that of reptiles, at another its respiratory organs are gills, like those of a fish, and so on. Many cases of monstrosities and deformities are thus explained, by supposing that the development of the fœtus was arrested at the time when it resembled one of the inferior beings.

Each of the lower animals, in like manner, goes through successive stages, representing all those below it in the scale of organization. Some authors explain in this manner the origin of all the different tribes of beings, both animal and vegetable, from a simple germ, originally derived, by electrical agency, from inorganic matter. Those who wish to see this hypotheses fully discussed, may consult the "*Vestiges of Crea-*

tion," a work abounding with curious information on these subjects. The following extract, from "Fletcher's Rudiments of Physiology," illustrates this point very well.

"It is a fact of the highest interest and moment that as the brain of every tribe of animals appear to pass, during its development, in succession through the types of all those below it, so the brain of man passes through the types of those of every tribe in the creation. It represents, accordingly, before the second month of utero-gestation, that of an avertebrated animal; at the second month, that of an osseous fish; at the third, that of a turtle; at the fourth, that of a bird; at the fifth, that of one of the rodentia; at the sixth, that of one of the ruminantia; at the seventh, that of one of the digitigrada; at the eighth, that of one of the quadrumana; till at length, at the ninth, it compasses the brain of Man! It is hardly necessary to say, that all this is only an approximation to the truth; since neither

is the brain of all osseous fishes, of all turtles, of all birds, nor of all the species of any one of the above order of mammals, by any means precisely the same, nor does the brain of the human fœtus at any time precisely resemble, perhaps, that of any individual whatever among the lower animals. Nevertheless, it may be said to represent, at each of the above-mentioned periods, the aggregate, as it were, of the brains of each of the tribes stated; consisting as it does, about the second month, chiefly of the mesial parts of the cerebellum, the corpora quadrigemina, thalami optici, rudiments of the hemispheres of the cerebrum and corpora striata; and receiving in succession, at the third, the rudiments of the lobes of the crebrum; at the fourth, those of of the fornix, corpus callosum, and septum lucidum; at the fifth, the tubor annulare, and so forth; the posterior lobes of the cerebrum increasing from before to behind, so as to cover the thalami optici about the fourth

month, the copora quadrigemina about the sixth, and the cerebellum about the seventh. This, then, is another example of an increase in the complexity of an organ succeeding its centralization; as if Nature, having first piled up her materials in one spot, delighted afterwards to employ her abundance, not so much in enlarging old parts as in forming new ones upon the old foundations, and thus adding to the complexity of a fabric, the rudimental structure of which is in all animals equally simple."

Neuro Spermatic Theory. This theory I believe originated with myself, and was first explained by me in my lectures at New York, in the Spring of 1844. I consider that one of the seminal Animalculæ, at the time of connexion, is lodged in the female ovum, or egg, and there finds itself in circumstances favorable to its further development into a human being. So far as this goes there is nothing new in my theory, such ideas having been

entertained before. All former advocates of this view, however, have supposed, that the Animalcule forms the actual and essential rudiment of the whole human being; and that the ovum merely receives and nourishes it. In this form, however, the theory is liable to many objections, which make it untenable. There is every reason to suppose that, the male and female principles are both essential to the actual formation of the fœtus, one as much as the other. And according to my view they play an equal part. I consider that the Animalcule is the rudiment, not of the whole body, but merely of *the nervous system!* And that the matter of the ovum organizes and forms the bones, muscles, and all the remainder! The shape of the Animalcule is strongly confirmatory of this view. We find it like a tadpole, with a large, round, flattened head, tapering off to a long, thin extremity, or tail. Now this is almost precisely the same form as that of the

great mass of nervous matter in the human being. This consists of a large, round, flattened mass, *the brain*, which tapers off into a long, thin extremity, *the spinal marrow*, like a tail! [*See Plate* 6.]

It is by the nervous system that we *think* and *feel*, and these functions are so different from those performed by inanimate beings, that we can scarcely imagine them to originate from unorganized matter. But by adopting this theory we suppose the thinking and feeling part of our system to originate from a being already animate, and possessing the germs of these functions. It is true we cannot explain the origin of the Animalculæ, nor is it necessary. They may either have always existed, or they may be produced by some agency with which we are unacquainted. The organization of the vitellus of the ovum, into bone, muscle, &c., is easy enough to admit, as it is only similar to what is constantly occuring in the body.

According to this theory, therefore, the rudiment of the nervous system is derived from the male, but its subsequent modifications occur through the female. Which agrees with the facts observed respecting the mental, and moral influence of the mother upon the fœtus. And also with the fact that disease, and other bodily infirmities, are more frequently derived from the mother. The difference of sex also, as before stated, can be explained by supposing the seminal Animaculæ to be sexual. It must, however, be borne in mind that this is merely *a theory*, like the others, and my readers must accept, or reject it, according as it appears probable or otherwise.

PHYSIOLOGY OF GENERATION

IN THE

HUMAN SPECIES.

SUPERFŒTATION.

By this, is meant, *the impregnation of a woman already pregnant!* It is often asked whether this is possible, and as a question of Medical Jurisprudence may arise from it, we will give it a little consideration.

As yet this is a disputed point; but it is universally admitted that, if it be possible at all, the two impregnations must take place nearly together; probably within less than an hour of each other. In my own opinion, however,

it is doubtful whether such an event can occur, except under circumstances, which we shall mention further on. After connexion the organs are so relaxed that they cannot perform their functions again, till rest has restored their tone. And, in case of conception, before this capability returns, certain changes have taken place, which effectually prevent the same thing occuring again. Immediately after conception the uterus begins to secrete, from its inner walls, a thick mucus, which blocks up its mouth, and the entrance to the fallopian tubes; and this evidently prevents any further transmission of the semen to the ovaries. In a short time this mucus organizes into the decidua, which closely lines the inner walls of the womb, and obstructs the passage still more completely. The second conception, therefore, could only occur before the secretion of the uterine mucus, consequent upon the first, and in that short time it is very improbable that the or-

gans would be sufficiently recovered from their exhaustion. But it appears very unlikely that such an event would have been left possible, under any circumstances.

The advocates for the possibility of superfœtation base their belief on certain curious cases of pregnancy, which cannot, as they think, be explained by any other means, though I think otherwise.

Females have been known to bring forth children at full term, and in some two or three months, or even longer, to bring forth others, also at full term. Now this seems to make it almost certain, that a second conception occurred while the woman was yet pregnant. In other cases two children have been born, at the some time, *of different colors*, which appears to prove still more conclusively, that a female may conceive from connexion with one man while she is yet pregnant by another! These cases, however, can be easily explained, without adopting the theory

of superfœtation. In cases of compound pregnancy it has frequently been found that one of the fœtusses has been retarded in its growth, so that at the ordinary period of gestation it will not be fully developed. Sometimes this imperfect one will be expelled with the others, but at other times it will be retained for weeks, or months, till it is more perfect. It has even been known for one of these cases to remain for years, as in the instance mentioned by M. Chally, where a fœtus was taken from a woman who had not conceived for thirty years. It is even possible that when two or more ova are impregnated at one time, the development of one may, by some accident, be retarded till a later period. Another explanation can also be given, which will apply in many cases. The uterus has been found in some females to be *double ;* that is, a kind of membranous partition divided it into two parts, one of which communicated with one ovary by the right fallopian

tube, and the other with the opposite one by the left fallopian tube. Each of these cavities would have a separate mouth, and be quite distinct from the other. A formation of this kind I have met with myself. Now in such a case we may admit the possibility of an impregnation taking place, in one of these cavities, from the right ovary, without interfering with the other; so that at a later period an impregnation could take place in that also, from the left ovary. The two cavities would in fact be almost like two distinct uteri, and there would be little more wonderful in their impregnation, than in that of two different women. This is the only kind of superfœtation which I can admit. And I have no doubt but what every case we have recorded, if all the facts were known, would admit of one or other of these explanations.

PHYSIOLOGY OF GENERATION

IN THE

HUMAN SPECIES.

THE SEXUAL FEELING,

Its origin, and use, with the consequences of unnatural, or excessive, indulgence.

THE sexual feeling, with the majority of human beings, is undoubtedly the strongest that is experienced. A proper gratification of it is, probably, productive of the highest physical enjoyment known, and is also at the foundation of the holiest and dearest moral and social delights. At the

same time its ignorant and uncontrolled indulgence originates more vice, and misery, than all other causes put togther.

This feeling cannot be suppressed, nor even subdued, to any great extent, without even greater injury than results from its unregulated license. Operating on all alike, with different degrees of intensity, depending on peculiarities of organization, it is an universal impulse, from which society cannot escape. We have, therefore, simply our choice between the curse of its unreasoning indulgence, and the blessings which results from its rational gratification.

The idea that it is necessarily immoral, or injurious in any way, is absurd, and easily disproved both by fact and reason. Nor is it correct to speak of it as being merely an *animal*, or *sensual*, impulse; it is certainly connected with a physical function, but it is one from which results the deepest and most sacred, moral, and social in-

terests and obligations! Sexual desire originates the holy feeling of *love*, the great tamer of mere brute passion, and the great sweetner of life. Observe, even in the lower animals, the mutual indifference of male and female when there is no sexual desire between them, and then note the difference when this desire is excited. The turbulent unruly master becomes the meek submissive slave, a tenderness is observed in their intercourse before unknown, and the enjoyment of both is increased a hundred fold. With the lower animals this delightful intercourse takes place only at certain periods, because the sexual feeling is only then excited; with human beings the feeling is constant, and, therefore, their intercourse is lasting, and its manner tender, and elevated. Love, in short, refines the manners, elevates the tastes, gives a new charm to life, and is the chief bond that holds society together.

But this love would not be born

without the sexual instinct. It is not experienced till that instinct is awakened, nor when it is extinguished. It is true that the mere animal feeling may exist without the more exalted sentiment of love, but it is not possible for love to exist without the sexual instinct at least, if not desire, having been felt. The accounts that we have of *Platonic* love, or love without physical emotion or desire, must be examined with care, and received with caution. The parties either deceive themselves, or wish to deceive others. They either do not know the real cause of their passion, or knowing, they wish to conceal it. To prove this it is only necessary to observe those in whom the sexual organs have been destroyed, or in whom they are imperfect. Those poor victims of ignorant tyranny, the *Eunuchs* of the East, never exhibit any feelings towards females different from what they show for males; neither love, nor yet friendship even, seem to form

any part of their character. I myself have met with some few persons naturally imperfect, who never experienced sexual promptings, and they all felt indifference, or even positive aversion, for the other sex. This is the case with the greater part of those who prefer to live single.

It must be admitted, however, that there are some persons who love intensely, and yet never have sexual desire, nor take pleasure in sexual intercourse. But even in these persons it is the sexual instinct which induces the fond attachment, though they may not be aware of it. For if they had been mutilated while young, like the Eunuchs, they would never have experienced any desire or fondness for the opposite sex; nor would they, if ever so perfect themselves, have any affection for another person who they knew was imperfect! All this shows that the same agent still is at work, though it may not be so apparent. In those who have become impotent in after

life, from any cause, love may still exist, though all desire and capability be gone; the recollection of past pleasures, and the association of ideas still keeping up the flame.

My object here, I wish to observe, is merely to show how far the moral emotions of love may depend on the sexual instinct, and not to put these moral emotions forward as an apology for the mere sensual feeling. I do not consider that any apology is needed for this feeling more than for any other that we experience. Like the desire for food and exercise, it results directly from a want of the system; it is part of our nature; and I have yet to be convinced that we are so imperfectly formed as to require any part to be removed, or so wise as to know where the pruning should be practised. That this feeling is grossly abused is no argument against it, any more than it would be against temperate eating and drinking, because we would have drunkards and gluttons. It is idle to

expect that it can ever be subdued to any great extent, nor is it desirable or necessary that it should be; all that is required from human beings is, to place its gratification under the control of reason. But this they will never do, so long as they are not reasoned with about it; while they are left in complete ignorance, passion alone prevails, and of course leads them as it does the mere brutes. I consider, in short, that the sexual feeling is a legitimate and moral source of pleasure in itself, and that it is also connected with other sources of enjoyment which add greatly to the sum total of human felicity. Its development is necessary to our mental and physical perfection, and its proper gratification to our health and well being.

I know there are persons who will affect to condemn this doctrine as *immoral*, I must, however, beg leave to say that I distrust either their judgment or their honesty. I have spoken

the simple truth, and without reserve. If there are any persons so unfortunate as to *fear* the truth, or *doubt its propriety*, I pity them, but cannot consent to suppress it on their account.

The delights of the domestic circle also, like those of love, spring from our sexual instinct. The desire for children, our love for them, as well as their very existence, depend entirely upon it. And these things form no inconsiderable item in the amount of human happiness; besides being strong inducements to a settled and peaceable mode of life, and thus leading to civilization and obedience to the laws.

In short it is easy to show that the development and well being of mankind, individually and socially, depends, to a great extent, upon the due and proper gratification of our sexual feelings. We ought, therefore, to know how those feelings originate, and in what manner they should be indulged and regulated. This brings us to speak of

The Moral and Physical Causes of the Sexual Feeling.

The sexual feeling, like every other physical sensation, results from a specific excitement of the nerves in certain parts of the body. In the male this part is chiefly the glans, on the end of the penis. In females it is either the external lips, the interior of the vagina, or Os Tincæ; but most usually the clitoris. The exciting cause is generally mechanical irritation, by copulation, or otherwise, to which persons are led by an intense desire. This desire is first produced by some unknown sympathy between the brain and sexual organs; afterwards the recollection of former pleasure increases its intensity.

The nature of this feeling cannot be described, since there is none other with which it can be compared. When fully developed it is, perhaps, stronger than any other, and exerts a more powerful influence, on human

action. Like hunger, it originates from a physical want, which if not gratified, operates injuriously on the whole system. We often see instances of persons so completely carried away by this feeling, as to sacrifice to it all else that they hold dear; fame, fortune, nay even life itself, are madly given for its indulgence. In others the broken health, and ruined mind, bear witness either to unnatural gratification, or a continual harrassing struggle between unquenchable desire, and a stern sense of moral duty. Some are, happily for them, so favorably organized, as to be exempt from these struggles and temptations, or only exposed to them in a slight degree. On this particular point much ignorance prevails, and great injustice is shown. All persons are judged by the same standard, and presumed to be equal, which is far from being correct. Temperate indulgence, in one, may require more mental effort than total continuence in another; for no

two are organized alike. And many-a-one is highly praised for a virtue, which, if the truth was known, they deserve small credit for, since they had but little temptation to do wrong. While others are condemned, without mercy, for failing, under circumstances when few could have kept their standing. With some persons it is more difficult, and even more annoying, to *indulge*, than it is with others to *abstain!* It would, therefore, be evidently unjust, to estimate the virtue of both by the same rule.

My object in making these remarks is not to apologise for licentiousness, nor yet to give the impression that when a person abstains, or is temperate, it is merely from a lack of sexual desire. Though I believe such is the case nine times out of ten. My object is to state a simple fact, which, when we decide upon the virtues, or failings, of poor human nature, should always be taken into account, if we wish to act with justice and charity.

The mere physical desire is controlled, and regulated, by the peculiar notions of duty, or expediency, which our education has implanted within us. Desire and duty are often at variance, and it depends on their relative strength as to which shall prevail. In the poor wretch whose education has been vicious, or neglected, and whose animal desires are strong, the sense of duty is comparatively weak, and indulgence is sought at any risk. But his more fortunate brother, whose moral impressions are strong, and who has been accustomed to control his feelings, first *reflects* upon the *propriety*, and probable *consequences* of such a step; thus controlling the first impulses of passion, and possibly overcoming it altogether. This shows us that the proper way to remove licentiousness is, not to merely declaim against it, or enact laws for its suppression, but to cultivate, properly, the superior parts of man's nature. This operates in two ways; his mere animal impulses

are counteracted, and opposed by moral ones, and are also considerably decreased in their intensity! For the cultivation of the moral and intellectual powers operates directly on the sexual organs, and diminishes their action.

The immediate physical cause of the sexual feeling is, the full development of the sexual organs, from which it directly results, as hunger does from an empty stomach. The time at which this development is complete, varies, as we have seen before, according to climate, the society which young people keep, and their mode of life. By favorable circumstances it may be long retarded. In our own society it is nearly always precocious, to the great injury of human beings. In the majority of cases, directly this feeling is experienced, the desire to gratify it becomes irresistable, and either naturally or unnaturally the gratification is obtained. This leads either to open licentiousness, or to the equally great evil of solitary vice. It is an indispu-

table fact that there are few young persons but what fall into one or the other of these evil practices at a very early age. This is the great curse of the day, it is a physical and moral blight which is fast deteriorating our race, and it is our imperative duty to find out, if possible, a cure for it. The only means hitherto depended upon have been, keeping young people in ignorance regarding sexual matters, and verbally declaiming against licentiousness. That these means are inoperative is proved by daily experience. The most ignorant, so far from being the most virtuous, are generally the reverse, and mere denounciation of any action seldom prevents its being performed, when inclination prompts to it. Besides, *preventing young people from knowing the nature of the sexual feeling, does not prevent them from experiencing it!* It will arise in them in spite of us, and is much heightened by their ignorant curiosity. When they do experience it, what do they know

about it? Confessedly nothing! How then can we expect that they should refrain from any means of indulgence which come in their way? They know no reason why they should not. But, it will be said, they have heard all these indulgences denounced! So they have, verbally, but their ignorance was so great that they did not know anything about what was denounced! And they may, therefore, well stand excused, if they assume that any particular indulgence they desire, was *not* the one condemned; particularly as their ignorance is esteemed a merit. Their reason being dormant respecting these things, from lack of knowledge, they are precisely like mere brutes, *left to animal feeling only!* There is, therefore, no wonder that they often act like brutes.

The best course would be to treat young persons with confidence, and act honestly towards them. As soon as they have arrived at that age when the sexual instinct is awakened, let

them know its nature, the circumstaces under which it may be gratified, and the consequences of improper indulgences. By thus treating them as rational beings we gain their confidence, and they will also feel a pride in meriting that confidence in future, which will act most usefully as a restraint. Whereas, by shunning all communication with them on the matter, we leave them entirely to the influence of their own blind desire, and for ever after are unable to know the truth respecting their actions. Confidence must be shown to them, and in the beginning too, or we shall never have it from them in return.

If this more enlighted course was adopted I have no doubt but it would diminish the evil; but still it would not entirely remove it. And for this reason, *the sexual feeling is now developed too early, before the mind is sufficiently matured to fully understand what is imparted!* This is the grand cause of the evil, and it must be re-

moved before a sweeping reform can be accomplished. The origin of this precocious virility is to be found in the circumstances by which young people are surrounded. Years before Nature herself would develop it, the sights they have seen, the conversation they have heard, have so led them to think upon it, and so stimulated their curiosity as to call it forth. A child cannot walk out, but his eyes and ears are assailed with sights and sounds all bearing on this topic. And in many of our public prints, and in a vast deal of the current literature, it is the same. The imprudent conversation of parents even, or their incautious actions, often lead to the same result. In short, a child very soon discovers that this is the main subject of interest with nearly every person he knows, and consequently it becomes so with him at once. The mystery that surrounds it adds powerfully to that interest, and the futile attempts

to keep him in ignorance only make him more determined to know.

Giving children exciting food and drink, not allowing them sufficient bodily exertion, and leaving their minds unoccupied with some innocent pursuits, are also powerful auxiliaries. A good physical education, accompanied with proper diet, makes the body muscular, disposes to active exertion, and keeps down all sexual excitement by exhausting the nervous energy in another way. In like manner, when the mind is fully and pleasantly occupied otherwise, it cannot be directed to these matters. Idleness, of body and mind, is more closely connected with licentiousness than many people suppose, particularly when accompanied by high living.

At the present time the sexual feeling is usually engendered at the most inexperienced age, and when young persons are least under the control either of themselves or other. It is on this account that advice, or warn-

ing, has so little effect, and that giving them information even, does not produce all the good it is otherwise capable of. But if they were properly educated and employed, both bodily and mentally, the period of puberty might be postponed till a more advanced age, when the reason would be riper and the experience greater.

It is not possible to say at what age puberty would occur, if it were not thus precociously established, though there is no doubt but it would be much later than now. Some authors, particularly the celebrated HUFELAND, in his "*Art of Prolonging Life*," have maintained that sexual intercourse should not be indulged in, by the female, till the twentieth, and, by the male, not till near the twenty-fifth year. Whatever we may think of the possibility, or advantage, of this practice, in a proper state of things, it is not practicable now, nor would it be beneficial if it were. There are few at the present time, except those who

are imperfect, that are either desirous or capable of this control, and though prudential considerations may forbid marriage till that age, they nevertheless practice licentiousness, in one form or another. I am of opinion, myself, that marriage should follow close upon puberty, if it do not a thousand evils result; and I do not think that, under proper arrangements, the desire would originate before gratification was proper.

Over excitement of the sexual organs, in early life, dwarfs and deforms the body, and disposes to, or engenders disease; it makes the mind imbecile, and the disposition irritable and unhappy. At all periods it is more destructive to health and happiness than any other cause.

The amount of sexual intercourse proper for any person cannot be stated, as it varies with individual peculiarities. There is no doubt, however, but that, as a general rule, it is practised far too much. I cannot, however,

agree with some visionaries, who contend that it should only take place to a sufficient extent to propagate the species. I believe that it is also a proper and useful mode of enjoyment, under proper control, and that it brings about certain physical and moral effects which cannot be produced by any other means. To understand this we must study the connexion between the sexual organs and the rest of the system.

In our description of the sexual organs we stated that their development produced a complete change in the whole being; gradually removing all the attributes of youth, and converting boys and girls, in every respect, into men and women. The whole body perfects itself, the mind expands, the feelings alter, and the entire character changes.

So entirely dependant are these changes upon the development of the sexual organs, that if the development be prevented no such changes occur.

Those who are made Eunuchs in early life remain children always. Their muscles are lax and weak, their bones light, their hair thin, and their voice shrill. Some even have no beard, and little or no hair on the pubes. The mind, like the body, is also imperfect; great numbers of these unfortunates are Idiots, and none of them exhibit but the most inferior mental power. The feelings likewise are entirely different from those experienced by others. They have no love or reverence for the other sex, no fondness for children, no friendship or attachment for any one. They are irritable and passionate, but cowardly and revengeful. Poor wretches, with all the weakness and depravity of human nature, and none of its strength or redeeming qualities. Their lives are miserable, but short, as they usually die of premature old age. Several of these beings have come under my notice, some mutilated by accident, some purposely, and others who were naturally imperfect.

Our opportunities of observing females in the same state of deprivation, are, of course, very rare; still cases have been known, sufficient to show that it has an equally deteriorating effect on them.

We also have many proofs of this in the case of animals when castrated. Compare the impetuous Bull with the patient Ox, the imperfect Horse with the entire one, or the Capon hatching eggs, and afterwards nursing the chickens like a Hen, with the haughty bellicose Rooster, and this will be evident.

Even if the deprivation occur in after life it will still produce a change.

In French books we find several instances narrated of soldiers who were mutilated by accident, in war. In all of them the character underwent a total change. Many brave men became arrant cowards, and others who had previously been noted for their high spirits, and joviality, became dull and melancholy. Similar effects may

be produced by debauchery, which, by destroying the tone and power of the organs, affects the system the same as if they were destroyed. This is highly important to be borne in mind.

Not only is it necessary, for the perfection of the whole human system, that the sexual organs should be fully developed, but I contend also that it is necessary for the subsequent healthy action of the system that these organs should be duly exercised. If they are not, the whole being will deteriorate. Undue continuence, in those properly organized, produces a state of nervous agitation which completely unsettles the mind, disposes the body to various diseases, and makes the disposition irritable and unhappy. It is true that cases of this kind are very rare, as most persons succumb to the temptation, and resort to some kind of gratification. Still I have known some such, and others are upon record.

Erotomania.

Sometimes the desire for sexual intercourse, when ungratified, rises to a perfect furor, overpowers the reason, and causes the individual to make any sacrifice, or run any risk, to appease it. This state of excitement is called *Nymphomania*, or *Furor Uterinus*, in women, and *Priapismus*, or *Satyriasis*, in men. It is also called in both, *Erotomania.*

In females it is produced by an irritable state of the uterus, vagina, and pudenda, and is frequently much heightened by an over excited imagination. It is in fact a real madness, or intense degree of hysterics. Its effects are exhibited in different ways, according to the character of the individual. Some will betray the utmost degree of wantonness, or even obscenity, in their language and manners. Some will be silent and melancholy, but unable to conceal their desire, when anything

rouses them from their lethargy. Others will be subject to a kind of fit, they will cry, laugh, shout, and be at times completely delirious. The intensity of the attack of course varies much in different persons. In some cases it merely causes a dissatisfied, unhappy, and fretful disposition, which continually harrasses the individual, makes her thin and weak, makes her mind unsteady, and her disposition careless and disagreeable. Some will become completely melancholy, and lose all power to arouse themselves. While others again will become furious with excitement, they will be passionate, revengeful, and even cruel. In the company of men they are scarcely able to contain themselves, and often by their looks and manner betray the intensity of their desire. The body also is consumed by a slow fever, the head burns, all the functions are disordered, and the whole system suffers. The greater part of those affections that we see in young females, which

go by the name of *chlorosis*, or green sickness, *hysterics*, and *nervousness*, arise from this cause. There is no question but that an immense amount of disease and suffering is thus produced, particularly among those who are prevented, by prudential or other considerations, from marrying so soon as they ought. It is of no use in these cases to talk about moral restraint, and self-command, or to blame these unfortunates. It is true the mind may, if it be strong enough, control this feeling, in some cases, but it cannot eradicate it; a continual struggle goes on, from which the individual suffers, let it terminate how it may. More often, however, the reason is completely overpowered, or even gives way altogether. It should be borne in mind that this is not a mere moral vagary, but a real disease, and must be treated accordingly. Marriage is, of course, the proper remedy, and in most cases it is the only one which will succeed. Much may be done,

however, sometimes by proper diet and regimen, with a little appropriate medical treatment. I have known Nymphomania to be produced by an irritating quality in the fluids of the several organs, and to be relieved by simple cleansing with water, at frequent intervals. From this cause it is sometimes produced in very young persons, to a degree scarcely conceivable by those who have not seen such cases. The application of cold lotions, saline purgatives, or leeches, to the parts will often be efficacious. Sometimes the urine is the irritating cause, and we must then attend to the kidneys, or bladder.

I have had, perhaps, as many cases of Nymphomania brought under my notice, as any one who ever lived, and I do not hesitate to say that I consider it the most distressing affection that can be experienced. The instances which I mentioned in the description of the female organs may be referred to, but I have known others equally

bad, or worse. More than once I have known delirium result from it, and oftentimes confirmed melancholy. Generally the evil is not borne long, either open indulgence, or solitary vice, being resorted to. And it is seldom that anything is known about either one or the other, till the consequences have become so obvious as to force themselves into notice. This is owing to a want of confidence between mothers and their daughters; instead of encouraging, and accustoming them to tell all their experience, and so becoming acquainted with their actual condition, the whole subject is carefully shunned, and they are left, in the darkness of ignorance, to the sole guidance of their strong and novel feelings.

Phrenologists tell us that the degree in which the sexual feeling is experienced, depends on the development of the cerebellum, or lower part of the brain. But I have not found that those subject to Nympho-

mania always have this part large; though I have known many instances of peculiar sympathy between the sexual organs and the cerebellum. Sometimes a disposition to Erotomania will appear to be hereditary, whole families being subject to it for many successive generations.

In males we seldom find this disease attain the same intensity as in females. They usually have more occupation of body and mind, and are also of a less irritable fibre. Besides males more readily obtain gratification, in one mode or other. The exhibitions of Satyriasis are mostly the same as those of Nymphomania, but modified by the difference in character of the two sexes. The confessions of several religious devotees, give a terrible picture of the trials to which its victims are subject; and my own observations have proved to me that their statements are no exaggeration.

In Gall's work "On the Functions of the Brain," is the following instance.

"A man had lived many years in a happy and fruitful union, and had acquired by his industry a respectable fortune. After having retired from business, and led an idle life, his predominant propensity gradually obtained the mastery over him, and he yielded to his desires to such a degree that, though still in possession of his reason, he looked on every woman as a victim, destined to gratify his sensual appetite. The moment he perceived a female from his window, he announced to his wife and daughters, with an air of the utmost delight, the bliss that awaited him. Finally this partial mania degenerated into general mania, and he died in an Insane Assylum at Vienna."

Several other instances of a similar kind will be found in the above work; and I have met with many such myself. A young man, of the most moral and exemplary character, once confessed to me that, at times, this propensity came upon him so strongly, he had to

confine himself in his chamber till it abated, as he dare not trust himself in sight of a female.

Some of the most distressing cases of Erotomania I have known have been in married persons, through one party being excessively warm, and the other unable to meet their advances. The misery which results from this unfortunate state of things is incalculable. I have no doubt but this leads to many of those unfortunate deviations from the path of rectitude, which we so often see; and I do not doubt but that the offending party is more frequently to be pitied than deserving of blame. I have known instances of men who were completely impotent, often from debauchery, marrying young females of ardent temperaments, whose advances they were utterly incapable of meeting. And yet these unfortunate, and much abused females, are expected to be as virtuous as if they were properly mated, and if they happen to fail are as harshly condemned as others.

To the honor of the female sex I must say here, that I have known many, under similar circumstances, who have endured with uncomplaining patience, for years and years, a struggle which their husbands would not support a single day.

It is seldom necessary, however, except from actual exhaustion by excess, or natural deficiency, that either one need remain thus indifferent; we know of means by which the coldest temperaments may be warmed, and excited to action. But these are topics for the consultation room, and not for an unprofessional treatise.

The sudden gratification of long restrained desire has often led to unexpected results The orgasm has been so intense in some cases of first connexions, as to produce paralysis, apoplexy, sudden blindness, deafness, or rupture of a blood vessel. I knew one young man who was attacked with lock-jaw, from over excitement on his wedding night, and a friend told me

of another who was delirious for some time after. Death has even been known to follow from the same cause.

The question is often asked whether males or females experience the sexual feeling most generally and intensely. This we cannot positively tell. My own impression, derived from extensive observation, leads me to the conclusion that it is much more general among males; but that it attains the greatest intensity in females! It is not unusual for females to faint away, from excess of pleasure; but it is seldom that males do so. On the contrary we find many females indifferent to connexion, but few males that are so.

It is also asked whether females may indulge at all times. In reply to this I can only say that their own experience will best guide them. I believe, myself, that nature will never prompt to connexion at any improper time; and that whenever desire arises without undue means being used, it is

proper to gratify it. During the menstrual period I never knew a female who desired connexion, but on the contrary they are generally repugnant to it; this shows it is improper at that time, even if other considerations did not forbid it. During pregnancy it will sometimes produce abortion, but this I have nearly always found to be in those who did not really desire it, but gave way to their husbands. I do not think that any pregnant female will suffer from sexual congress, so long as it is perfectly agreeable to her, and not in excess. Indeed it is often more desired at that time than at any other, and I am inclined to think that more evil would result from restraint, in such cases, than from gratification. The same remarks will also apply to nursing, and other conditions.

Some Physiologists have contended that the sexual feeling is universal, among living beings, both animal and vegetable, but this of course we cannot tell. That it is experienced by

all animals who copulate there is no doubt, and it is possible also in those who have no connexion, as in fish. Plants may also have some peculiar sympathy of which we are not aware; and certainly the curious efforts which the male and female organs sometimes make to unite, seem almost to make it probable. This, however, is only speculation, and we have not time to indulge in it.

Effects of Excessive Indulgence.

Sexual congress exhausts the nervous energy more, perhaps, than any other act; in the male it also drains the fluids. It should, therefore, be indulged in only when a superabundance of these exists, which is indicated by nature creating the desire. If it be practised at any other time, or too frequently, it of course takes more or less of the energy, or nourishment, which is needed for other purposes, and thus impoverishes the system.

The amount of intercourse which may be proper, differs of course in each person, and can be best determined by their own experience. Nature should never be forced, by either physical or mental stimuli, and then it is not likely that she will overtask herself.

The immediate effect of excessive coition are, great lassitude and depression of spirits. This is followed, after a time, by other symptoms, many of which are never suspected to arise from this cause. Most generally the memory soon begins to fail, and the mind cannot be directed to one thing for any length of time, but wanders continually; sometimes it even becomes unsettled altogether and complete fatuity results. The senses are very apt to fail, particularly the eyes, which become affected in various ways, from mere weakness to every degree of inflammation, and even blindness. The hearing will often become affected, and the head will be subject to a distressing fulness, with dizziness, noises,

and soreness all over. The individual becomes excessively nervous, full of apprehension, irritable, and wretched. He dislikes society, from mere incapability of exertion, becomes at last melancholy, or mad, and often terminates his existence by suicide. The different organs become more or less deranged and perform their functions imperfectly; this is particularly the case with the digestive apparatus, the kidneys, and bladder. The genital organs themselves begin to fail, but little semen is secreted, erection is imperfect, they shrink away, the gratification becomes less, and finally complete impotence and aversion follows.

This is also frequently attended with inflammation of the prostate gland, swelled testicle, and involuntary emission of the urine and semen.

All these symptoms are, it is true, seldom found in one person, but more or less they characterize every case. Some persons will begin to experience them very soon, while others

will not for a long time. It is but rare, however, that any one who abuses himself will miss them altogether.

I do not hesitate to say that a very large portion of the human race are guilty of this excess, probably the great majority, and that a great portion of the evils and suffering which afflict society are produced by it. Indeed I believe that licentiousness, in one form or other, is the cause of nearly all the disease, both of body and mind, which exists! In fact I have sometimes almost thought it was *the sole cause*, for I know of no single disease but what it will either cause directly, or indirectly lead to! Even if it lead to nothing more than its unfailing offspring *the venereal disease*, it would still do more than all other causes put together! For this may truly be called in itself *the mother of diseases*, poisoning life at its very source, and carrying horrid decay to the very bones and marrow. Consumption,

king's evil, cancer, and other scourges of the like kind, all depend on what is called a *scrophulous taint* in the system; and what is more likely to be the origin of scrophula, than this same venereal disease? Is it not in fact nearly identical with it in all its phases?

Many an estimable father and husband, ruins his health, unfits himself for his duties, becomes miserable himself, and a source of discomfort to others, and all through an unthinking excess. And many a man, even while young, finds to his despair, when married, that his previous debauchery has deprived him of all pleasure with his partner, and of all hope of ever becoming a father! Fearful, indeed, is the penalty which Nature exacts for infringing her laws, and deeply important it is for us to understand those laws, and accustom ourselves to keep them.

Females I do not think are so addicted to excessive indulgence as men, at

least not generally; nor does it appear to affect them so much. This is owing to the circumstance of the woman being comparatively passive, and not having any drain upon the fluids. Still it injures them and seriously too. The same effects are often produced in them as in the male, though not so violently. Sterility frequently results from it; and this is the reason why those who indulge too much, as prostitutes for instance, seldom conceive; the sexual organs lose all tone and power from their abuse, on the same principle that the stomach suffers from indigestion when it has been overloaded.

In short, excess in early life prevents the proper and full development of the system, it afterwards engenders disease, and finally brings on premature old age and death, with pain and suffering, which might otherwise be unknown.

PHYSIOLOGY OF GENERATION

IN THE

HUMAN SPECIES.

SOLITARY VICE, ONANISM, OR MASTURBATION.

THIS kind of licentiousness is more prevalent than any other, and much worse in its effects. Dreadful as are the consequences of excess, in the natural way, they are but trivial compared with those which follow from solitary vice; nor do I think they can, under any circumstances, equal them.

Most persons are aware that this practice prevails, and that it is injurious, but it is only those who have

long been familiar with it, as a subject of practice and study, that can be aware of its great extent and fearful effects. The truth in fact can scarcely be believed by those not familiar with it. My own opportunities for acquiring information have been very great, so as to make me acquainted with this terrible evil in every particular, and I do not hesitate to say that it is *the master evil* of the present day! I am firmly convinced that it leads to more disease, of body and mind, more suffering, and premature decay, *than all other causes put together!* Here I make no reservation, nor do I exaggerate, but, on the contrary, I feel convinced that my statement is under rather than over the truth.

This vice is *almost universal*, the exceptions to it being very rare, particularly in the rising generation. I believe it may be safely asserted that *ninety-nine out of every hundred are addicted to it!* And such are the circumstances in which young people are now

placed, that, instead of its decreasing, it is every day becoming more confirmed and extended.

I have reason to suppose that it is as general in the one sex as the other. If there be any difference it is probable that females practice it most; but simply because they less frequently have natural indulgence in their power.

It is often commenced in extreme youth, nay even in childhood. I have known instances of children not more than eight years of age, and even younger, being addicted to it. In most of these cases no such thing was suspected, and the poor victims were fast hurrying to an untimely grave. Even when told, their guardians could scarcely believe the statement, till their own observation convinced them it was true; they were then extremely anxious to have the evil removed, which, fortunately, was in most cases accomplished. It is not merely an error of youth, however, but becomes a confirmed and growing habit, to

which the individual is a victim all his days. I have known middle aged, and even old persons, who had never been able to emancipate themselves from it.

The objects of this practice is, to excite, by artificial means, the sexual feeling. This is accomplished by friction, of the most sensitive parts of the genitals, usually with the hand, but often by other means; assisted by a highly excited state of the imagination. In males the penis is the part most frequently operated upon, and in females the clitoris, or labia. Some females, however, use an instrument of some kind, to enter the vagina, or even reach the Os Tincæ. Incredible as it may appear, articles of this kind are actually manufactured in great quanties, and sold, in most of our large cities, with a full knowledge of the purpose for which they are intended! A friend of mine, who was skeptical on this point, a short time ago sent for one, and to his great surprise obtained

it as readily as any ordinary article; this was at an establishment where nothing of the kind would be suspected, by those not previously informed.

With regard to the commencement of this practice, some persons have supposed that it must always be learned from another, or at least that some intimation must be had of its nature before it is begun. This, however, I know is not always necessary. From various causes, most of which we have stated in a former part of this work, the genital organs become precociously developed, and highly sensitive. This produces slight irritation and uneasiness, to relieve which the hand is directed to them; the friction of which produces a new and pleasant sensation before unknown. When once this has been experienced, the desire to create it again becomes irresistible, and with each new indulgence the habit strengthens and becomes more confirmed. In most cases the individual is completely ignorant of the nature of this new

indulgence, and knows nothing of its probable consequences. This knowledge, if given in time, would often destroy the habit, but it is seldom given till too late to be of service; indeed, in most cases, the victim has to find it out by dear bought experience.

Nevertheless, this practice is most generally acquired from others, and for this reason prevails in nearly all institutions where young persons are congregated; nor can this be prevented under present arrangements. Many conductors of these establishments are unacquainted with the existence of the evil; others use every means they can devise to prevent or suppress it; though often without success. From the nature of the practice it cannot be prevented, when there is a disposition to it, unless the offender is kept under *constant surveilliance!*

In my public lectures I have always made this a special topic, speaking the truth upon it without reserve, but in charity, and with a sincere desire to

do good. This has made me the confidant of hundreds, who would never have disclosed their failings to any one else, and has enabled me to gather more facts bearing on the subject than, perhaps, ever came in the way of any one individual before. It is neither useful nor just, however, to expose the weaknesses of human nature, more than is necessary for their correction; I shall therefore only make use of the information I have thus acquired in a general way, and for that purpose.

When in New York City, in the fall of 1844, I was accosted, after my lecture on this subject, by an old gentleman, who desired to speak with me in private. When we were alone he said to me, "Doctor you are the first person I ever heard speak plainly on this evil practice, and as I am, unfortunately, aware, by sad experience, of the truth of your assertions, I felt much interested in your discourse, and resolved, if you thought fit, to communicate the details of a case with which

I am but too familiar." I thanked him for his confidence, and he gave me the following particulars.

He had a son, a fine healthy, lively child, aged eleven years old, whom he sent to a celebrated accademy for young gentlemen in the suburbs of a neighboring city. For the first six months he continued to receive the most flattering accounts of his son's progress, and was highly pleased with him when he returned home at the vacation. In a short time after he was surprised and grieved to hear that his health was failing, and that he was much more backward than formerly. Medical advice was sought immediately, and the assurance was given that there was nothing serious the matter, and that he would probably rally in a short time. The child kept on in this manner for twelve months longer, gradually becoming worse, until at last he was brought home. The father described his condition at this time as most distressing. He was thin as a

skeleton, weak in body and mind, and completely sunk in a deep despondency, from which nothing seemed permanently to rouse him. At last he took to his bed and died before he was thirteen. One night, however, while he was sick, the father was sitting up with him, and, being weary, leaned back in his chair with his eyes closed as if asleep. While in this state some motion of his son partially roused him, and through his half open eyes, he saw him in a situation which left no doubt that he was practising Masturbation. The feelings of the father can better be conceived than described; being a man of information he partly knew the consequences of this vice, and immediately the idea rushed upon him that this was the cause of his son's sickness, and he at once resolved to discover if his suspicions were true. In the morning after, he began to talk with his child about his school-fellows, asking him as to their practices in play, &c.; and at last fixing his eyes

upon him, he asked him if any ever practised this habit before him? The child burst into tears, and laid his head in his bosom. By a little gentle management he led him to confess that he had been addicted to this vice ever since he went to school, having been taught it by a playmate. Sometimes he practised it three or four times in a day. He also assured his father that there was not one he knew in the school but what did the same, it being considered a meritorious thing, and one which every boy should aim at. The poor fellow had become partly aware, himself, that it was causing his misery, and wished he had not done it, but it had become so much a part of his nature he could not refrain. The father felt as if a thunderbolt had broken upon him; here was his only child stricken before his eyes, and nobody suspecting the cause till it was too late. Said he to me, "I hope my sad experience may enlighten some one else in time."

A short time after while lecturing at the city where his son was sent, I was introduced to the principal of the very school, whom he had already mentioned to me by name. Finding him a man of intelligence I commenced talking on the subject of solitary vice, and observed that he appeared much interested. As confidence became established he at last confessed, that the prevalence of this practice, among his pupils, was a constant annoyance to him.

"I know," said he, "that my establishment is only like others, for I do not think there is one in which it does not prevail more or less, but as I know how baneful it is I am deeply concerned about it. I find it impossible to prevent it altogether, do what I will. All our scholars sleep seperate, and we keep a constant eye upon them, but still I know the evil exists; and, by some accident or other, each new comer becomes tainted with it. I am firmly convinced that there is no in-

stitution where young people are brought together but in which the practice may be found; and I have no faith in any means of preventing it but such as you propose."

Numerous, indeed, are the melancholy instances of this kind daily to be met with. Many a youth robust with health, and with every indication of the highest talents, is sent by his parents to some seminary to complete his education, and returns after a time, debilitated in mind and body, and without either hope, energy, or capability. They mourn over his ruin, but never dream of what caused it; and even if told could not, in many cases, understand how it had been brought about. I have a case of this kind in my mind now. It is that of a young man who had made the highest attainments, and who gave promise of being one day among the first and greatest in the land. His friends looked upon him with pride and confidence, and gloried in the prospect of

his future exaltation. But, alas, a blight came over their hopes; he began to fade, his mind became imbecile, and at last he sunk far below the ordinary standard, without even the desire to rise. He was pointed out to me by a relative, who also told me that it was the practice of solitary vice, learnt at college, which had made him the melancholy wreck he was.

On another occasion an old man spoke to me after my lecture, and told me that he had a son who had long been in a desperate condition, whose cause of complaint he had never been able to ascertain. "But," said he, "from what you say of the effects of this practice, I think that must be it; I will, however, ascertain if possible immediately." The next week I saw him again, and he told me that he had asked the medical man, who had his son in charge, whether he thought such was the case? and he immediately replied, "Yes! now you have asked me I can tell you; it is that practice,

and nothing else, which has brought your son to his present pitiable condition. I did not like to mention it to you before, for fear you might be, like many others, merely offended with me for speaking the truth; but since you ask, I presume you desire to know." The young man was then so weak he could scarcely stand, and so much affected in his mind, that a person was kept with him continually, to prevent him committing suicide. I saw the father a little time after again, and he told me, with tears in his eyes, that his son had died in the mean time. "Had it not been for you," said he, "I should never have known what killed him. I have now another child much younger, who might have died in the same way; but now I know the evil I trust I shall be able to prevent it."

Another case, somewhat similar, came under my notice, of a little girl, who had been taught the practice by a female servant with whom she slept.

The mother fortunately discovered it, before the evil was gone too far, and by a proper course of moral and medical treatment it was soon suppressed altogether, and she perfectly recovered.

In one instance I knew a boarding school, where fourteen young females resided, which had to be entirely broken up, on account of this practice. One after another fell sick, and all eventually were sent home. Previous to which, the principal ascertained, from the confession of one among them, that for a length of time they had all been addicted to this vice. Nine out of these fourteen died in less than five years after!

I am every day receiving written or verbal confessions, of persons who have suffered from this practice. They are all much of the same character, so that one will suffice to give an idea of the whole. The following letter is very explicit, and full in its statements, I therefore select it from among my collection.

"DEAR SIR:

"In the course of your lecture last evening, at which I was present, you spoke upon the subject of Masturbation, and requested any of your audience, who thought fit, to ask you for any further information they might desire, either verbally or by writing. I am myself a sufferer from the effects of this practice even now, though over thirty years of age; and I wish to know whether any relief can be obtained. To enable you better to decide, I will make a full confession of my past conduct, and present condition.

"I was first taught this practice when at school, being then about fourteen. At first I did not resort to it much, but when about sixteen I used to masturbate often, as much as three or four times a day, till I became so weak and unwell that I had not power to do it so frequently. I still, however, kept on at intervals, till I was twenty-two or three, but at that time

my sexual power, which had been gradually weakening, seemed to die away altogether, and I had no longer either desire or capability. During all this time I had never carnally known a woman. When about twenty-eight my friends wished me to marry, and I too was desirous of doing so, being tenderly attached to an amiable female, whom I had known from childhood, who also reciprocated my affection. But then came the reflection—was I fit for marriage? This troubled me much, and I knew not what to do. At last I confided my trouble, in part, to an acquaintance, who advised me to procure the company of a female and test my powers. This I did, and found, to my shame and mortification, that I was perfectly powerless and impotent! My grief and chagrin were unbounded; I was compelled, by means of one excuse or other, to put off the marriage, hoping in the mean time to procure some assistance. I tried various Cordials and Tinctures which I

saw advertised, but none did me any good, and I was ashamed of speaking to any Physician. I am now about thirty-one, no better, and in sad perplexity what to do. I cannot bring my mind to abandon the woman I love, without giving a sufficient reason, and yet the only sufficient one, that is the true one, I dare not give.

"Is there any hope for me? If so tell me what to do immediately.

"The effects produced upon me by the practice were these. At first I merely felt disinclined to much exertion, either of body or mind, but this gradually became worse, till at last it required great effort to rouse myself sufficiently to proceed with my daily avocations. My strength failed and I became very weak. My head was all along heavy and dizzy; my eyes weak, and as if a cobweb were before them, obstructing the view. I had pain, particularly in the small of the back, which appeared as if it would give way. My digestion became much

impared, and I suffered extremely from dyspepsia. Flying pains occurred at intervals all over my body, often at night, preventing my sleep. I was also subject to erections while asleep, sometimes accompanied with emissions, though not always; when such was the case I was always worse next morning. My memory was very bad and I could scarcely bring myself to think, two minutes together, on the same subject. I was very irritable, and so wretchedly low spirited, that I was frequently on the point of committing suicide. In fact I was so miserable that life was a burden. After I became completely impotent I seemed to recover a little, though still very uncomfortable. I am at present a little stronger, but most of my symptoms appear at times. I still suffer from the heaviness in my head, and the cloudiness in my eyes, which sometimes seem full of black specks, floating in them. My memory is no better, nor am I any more capable of

mental effort. My digestion is better. The erections at night occur yet, although I cannot procure one while awake. My spirits are very low, and my present condition makes them worse. My genital organs appear as large as in other persons, and no one would suspect, from their appearance, that I was impotent. I have not had any signs of semen existing for the last twelve months, and when it did appear, which was in consequence of an exciting dream, it was in small quantity, and very thin. I have repeatedly tried lately to have connexion, but am never able to do so; having but little desire, and scarcely any power of erection.

"Now tell me candidly, doctor, do you think that any course of treatment can be depended upon, with any reasonable prospect of success, for doing me good, and recovering my lost power?

"An early answer will oblige,

"Yours, &c. —— ——."

This letter gives a faithful picture of most of those cases which come under my notice. Some are much worse it is true, and others not quite so bad. The effects produced depend upon the extent of the practice, the constitution of the individual, his mode of life, and other circumstances. The most general symptoms are, such as those described under the head of excessive indulgence, and in the cases we have just narrated. Perhaps the most general results, at first, are, loss of memory, inability to apply the mind to any one object, low spirits and irritability; accompanied by heaviness and dizziness of the head, and cloudiness or inflammation of the eyes, with more or less derangement of the stomach, kidneys, and bladder. Afterwards the system becomes more extensively affected, and many other effects are produced; particularly loss of sexual desire, and impotence or sterility. This often prevents men from marrying, or makes them and

their partners wretched for life, if they do. Insanity often results from it, indeed I believe more frequently from this cause than from any other. Our Lunatic Assylums often present us with lamentable instances of this kind. The termination is usually an untimely death, either by premature decay, or hasty suicide.

A gentleman from Cuba once told me, that he had a valuable slave who was made insane by this practice, and whom they had to confine in consequence. He had been kept on a plantation remote from any females for a long time; and so thoroughly addicted was he to the habit, that when insane they had to confine his hands to prevent it! He at last died in a perfect fury of madness.

In such cases it is sometimes advantageous to decrease the sexual feeling; and this, I have accidentally discovered, may be nearly always accomplished, by the external application of a perfectly harmless substance. It

has the advantage also, of operating only while used, and producing no lasting effect.

The reason why Masturbation is more injurious than excessive indulgence is, because it is accomplished solely by an intensely excited imagination, without any natural and appropriate associations, either physical or moral. This completely drains all nervous energy, and leaves the individual in a state of complete exhaustion. It can also be practised so readily; and, from its not appeasing the desire, is so often repeated.

Females do not always appear to suffer so much from it at first, as males, probably because no seminal discharge takes place. It will eventually, however, produce the same effects in them, as well as some others peculiar to them alone. It is very apt to make the skin sallow, the eyes hollow and dark underneath, and sometimes to produce eruptions on the skin. When instruments are used, it also de-

stroys the hymen, and brings the organs to the same state and appearance as after marriage. It has not unfrequently happened that young women have been accused, by their husbands, of unchastity on this account; and certainly, in a moral point of view, the charge might be considered as well founded, as much so as if they had had actual connexion with one of the other sex.

It may appear strange to some, why it is that medical men are not aware of this evil, or, if they are aware of it, why they do not more frequently inform parents of its existence. Medical men, generally, are aware of the great extent of this practice, and also of its effects; but, from the ignorance and predjudice which prevails, they dare not say what they know. A Physician once remarked to me, after one of my lectures, that he had numerous instances in his practice similar to those I described; "But," said he, "I scarcely ever dare speak to the

parents about it, even when I am certain, much less when I only suspect. There are few but what would either feel, or affect to feel, insulted at the very suspicion of such a thing in their children, and if I were to mention my thoughts I should probably give offence, and be discharged for my pains." This I know to be the case, having often met with similar treatment myself. The fact is, before we can reform the children we must enlighten the parents! They will then act with us, and much may be accomplished.

With regard to the means to be employed in removing the effects of Masturbation, and the prospect of their succeeding, little can be said, since they must vary in every individual case. The first requisite, however, in every instance, is the total abandonment of the practice! Without this be done nothing else will be of much service. It is but seldom, however, that any individual can emancipate himself from this vile habit, let him

be ever so well aware of its effects. I have had persons confess to me, that they were utterly unable to abandon it, though fully aware that it was ruining them body and mind. Indeed I do not know of a single instance where a person deliberately left it off, unless they had become impotent, or procured natural gratification; but in most cases it soon unfits them for proper indulgence. In some cases, particularly in young persons, the tendency to it may be much decreased by a little medical treatment, attention to diet, regimen, &c. The fear of the consequences, when these are properly placed before them, may operate a little; and still more the fear of *detection!* Let them know, that it produces a certain effect upon their appearance, which, to a practised eye, *points them out as certainly as if they had it written on their foreheads!* So that in spite of the secresy with which they practice the habit, it still betrays them. I do not expect, however, that much can be

done in the way of *curing* the evil when it is established; the only practicable plan of removing it is, to enlighten young people in time, as I have before stated, and so prevent it from being begun! Till this plan be adopted, but little good will be done.

FINIS.

ADDENDA.

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To make this work more eomplete, I have determined to add to it, most of the curious cases to be found in the different authors on Medical Jurisprudence, which may serve to elucidate the different topics touched upon. This plan I thought better than embodying them all in the work itself, as it leaves the explanations more brief, and less confused. These additions can be studied with advantage, after the work itself is read, and each particular case will easily be referred to its appropriate place. These extracts have principally been made from "The Principles of Forensic Medicine, by Wm. A. Guy," Edited by Ch. A. Lee, M.D. First American edition, Harper & Brothers, New-York, 1845.

That being the most valuable summary of information on these subjects, now extant. Those who desire to push these enquiries further, cannot do better than consult that excellent work.

HERMAPHRODITES.

Many vulgar errors prevail on this subject; which the following facts and authorities, may tend to remove.

"There are three different conditions of the organs of generation which may present difficulties to the medical examiner.

1. "Male organs resembling the female. (Androgyni.) The most common malformation of this sort is where the scrotum is divided into two parts, which sometimes contain the testicles, while at others those organs, one or both, are situated behind the external ring. The cleft scrotum corresponds to the labia of the female. There is also in some cases a *cul de sac* corresponding in situation with the vagina. The penis is short and imperfectly formed, and, like the clitoris, imperforate. The canal of the urethra opens at its base, or in the perineum, near the anus. It is often en-

larged at its commencement, so as to resemble the vagina; and instances have occurred in which sexual intercourse has taken place through this enlarged canal of the urethra. From the position of the opening of the urethra beneath the imperforate penis, these persons are called *hypospadians*.

"The existence of the testicles in the folds resembling the labia, the communication of the opening beneath the imperforate penis or in the perineum with the bladder, the absence of all communication of the *cul de sac* which occupies the place of the vagina with the cavity of the uterus, and, in the adult, the absence of menstruation, —will enable us at once to distinguish the sex. It will scarcely be necessary to examine the conformation of the body generally, which, in most of these cases, nearly approaches that of the male. The development of the muscles, the tone of the voice, the tastes and habits, are more those of a man than of a woman. Nevertheless there are cases in which an enlargement of the breasts and a preference for the society of the male exist, which, in the absence of a careful examination of the organs of generation, might lead us into error. In other instances the sexual passion is absent.

Many cases of this sort are related in books, and the majority of them are referred to by Beck. There are also preparations illustrative of these malformations in most of our museums.

"Sometimes the penis, whether well or ill-formed, is found confined to the scrotum by a particular formation of the integuments. This malformation, with the other deviations from the normal structure just described, occurred in two cases, one a negro, the other a European, of which Cheselden gives engravings. In the case of a child baptized and brought up as a girl, Mr. Brand, by a slight incision, liberated the restricted parts, and proved to the parents, that they had mistaken the sex of their child.

"There is still another malformation belonging to this division, and which might possibly give rise to doubt as to the sex, viz. a deficiency of the urinary bladder, and of the lower and anterior portion of the abdominal parietes, the place of which is occupied by a red and sensitive mass of an irregular fungus-like substance, with the ureters opening upon it. This defect is generally accompanied by important alterations in the organs of generation. 'The urethra is deficient, and the penis conse-

quently imperforate. It is also very short, never exceeding two inches even in the adult. The vesiculæ seminales open near the fungous mass above-mentioned, or in the urethra, or in a small tubercle at the root of the penis. The testicles are generally natural, either contained in the scrotum, or they have not descended. The sexual appetite in some of these individuals has been weak; in others strong; in others altogether wanting.' The persons who have this malformation are called *Epispadians.*

2. "The female organs may resemble the male. (Androgynæ.) An enlarged clitoris is the most common form of malformation belonging to this class. Sir Everard Home relates an instance of this kind occurring in a Mandingo negress, and other cases occurring in Europeans are also on record. None of them presented any real difficulty, though some have excited great interest. The absence of testicles from the labia, the presence of a vagina and uterus, the occurrence of menstruation, either of these singly or all combined, render the distinction easy.

"Another malformation belonging to this class is a prolapsus uteri. Sir Everard Home mentions the case of a Frenchwo-

man who was shewn as a curiosity, and whom he himself examined. The prolapsus was evident on inspection. She pretended to have the power of a male. The following case is from Mahon: 'Margaret Malaure came to Paris in 1693, dressed as a man. She considered herself as possessing the organs of both sexes, and stated that she was able to employ both. Her person was exhibited; and several physicians and surgeons agreed with the common opinion so much, as to give certificates that she was an hermaphrodite.' She was consequently ordered to change her name and wear male attire. 'Saviard, an eminent surgeon, was, however, incredulous. He examined her in the presence of his brother practitioners, and found that she had a prolapsus uteri which he reduced.' The difficulty thus solved, she was allowed again to resume her female attire.

"A similar case is mentioned by Sir Everard Home: also one in the Pandects of Valentini, (Vol. 1, p. 38.) In the former, the woman was exhibited as a curiosity, and in the course of a few weeks, made £400. The prolapse was evident on inspection, though she pretended to have the powers of a male. All cases of supposed hermaphrodites may be referred to one of

three classes. 1. They are either males with some unusual organization or position of the urinary or generative organs; or 2. Females with an enlarged clitoris, or prolapsed uterus; or 3. Individuals in whom the generative organs have not produced their usual effect in influencing the development of the body. For the most part they are incapable of exerting any sexual function. It is possible that in some of the supposed cases of hermaphrodisms, as Velpeau has suggested, congenital hernia of the ovaries may be mistaken for testicles. Such cases have been observed by Marjolin, and Professor Mayer of Bonn. (*London Lancet, Vol. 9, p.* 169.)

3. "The organs of the two sexes may be blended, some one or more organs of the one sex being superadded to, or substituted for, those of the other.

"Many cases of this malformation are on record. An ovary has been found on the left side and a testis on the right, in cases reported by M. Sue, Professor Rudolphi, and Professor Mayer, as also in a case dissected by Varole. The reverse malformation occurred in the case of Hubert Jean Pierre, and in a case mentioned by Arnaud. In other instances again the external organs have approximated closely to

the female type, and the internal to the male, or the reverse.

"It is unnecessary to add that no case of real hermaphroditism is on record. 'No monster has been described, having both a penis and clitoris; nor with a testis and ovarium on the same side—we may venture to say, with testes and ovaria; nor having a prostate and uterus.' There can be little doubt that what was really a prostate has been called a uterus, and that the testicles and ovaries have been mistaken for each other."

AGE WHEN THE MALE IS CAPABLE.

Age.—"A too tender or too advanced an age may be regarded as a cause of impotence. Before puberty, that is, before the seminal secretion has taken place, complete sexual intercourse may be assumed to be impossible. As this age is variable, it will not be possible to define it: we must therefore rest our judgment on the general conformation of the body, the character of the voice, the growth of the hair, and the development of the organs of generation themselves.

"There is considerable difficulty in determining the question at how early a pe-

riod the male is capable of procreation. It was decided in the reign of Henry VI., in England, that the issue was a bastard, when the husband was within the age of fourteen. And yet we read in the Berkeley manuscripts, that Maurice, the third Lord Berkeley, (Edward I.,) was married at eight years old, and a father before he was fourteen. The historian adds, 'more than a dozen instances of paternity occur before that age.

"But impotence may arise from the infirmity of age as well as from immaturity; and the question arises, At what age do the powers of procreation cease?

"This question has acquired an unusual interest in consequence of the celebrated Banbury Peerage Case, which was brought before the House of Lords and decided in the year 1813. The principal argument urged against the claimant was, that the ancestor under whom he claimed could not have been the son of Lord Banbury, because that nobleman was eighty years old when the child was born. In reference to this question of age, Sir Samuel Romilly expressed himself as follows: 'The objection to the age of Lord Banbury may at once be dismissed. The law of England admits of no age at which a man may not

become a father; and many medical authorities may be cited to show that this rule is founded on reason. Dr. Gregory, of Edinburgh, whose name must be familiar to all admirers of science, says upon this subject,—'Magna autem de his rebus differentia; decantantur enim exempla senum in castris Veneris strenue merentium, postquam centum annos compleverant; neque sane dubium, aut adeo rarum octogenarum patrem fieri.' Haller likewise pronounces a man of ninety to be capable of procreating. Parr became a father in his one hundred and fortieth year. In short, the liberality of the law on this subject is excessive; for there is no age, from seven upwards, at which a man is denied the privilege of having children.' On the same occasion, Lord Erskine made the following remarks: 'But what evidence is there of Lord Banbury having been impotent? There is no statute of limitations on the powers and faculties of man. Instances of robust longevity might be cited still more extraordinary. Sir Stephen Fox married at the age of seventy-seven, and had four children; the first child was born when the father was seventy-eight, the second and third were twins in the following year, and the fourth was born when the

father was eighty-one. Parr became a father when even his son was of a more advanced age than Lord Banbury.' The Attorney-General, Sir Vicary Gibbs, who opposed the claimant's title in the House of Lords, evidently felt the objection on the score of age to be far from valid, for he shifts his argument as rapidly as possible from it to more secure ground. He says, 'age may not be a proof of impotency, but it is evidence of it. The probability of the Earl's begetting a child at eighty is very slight, and it is not increased by the appearance of another child two years later. Instances have been adduced of these extroardinary births, but none have been cited in which a man at eighty-two, having begotten a son, had concealed the birth of such son.' We may conclude that the objection here urged did not appear to the objector himself to have any great weight from the slight stress he lays upon it, and from his anxiety to escape to an objection altogether different. With regard to age, then, it is clear that no limit is fixed by law, or can be assigned by science, at which the power of procreation ceases. Old age, provided it be a robust old age, is obviously no impediment to procreation; and in the case of Lord Banbury there is ample evidence of

his having been capable of strong exercise until within a short period of his death."

AGE WHEN THE FEMALE IS CAPABLE.

"*Age.*—The limits of child-bearing in women are commonly the first and last menstruation; but, in rare instances, conception has been known to take place before or after this occurrence. Cases of premature fruitfulness are related by high authorities. Thus, Montgomery delivered a female of twins before the completion of her 15th year; La Motte and Sir E. Home gives instances of pregnancy in the 13th year; the last-named author another in the 12th; and Bruce, in Abyssinia, and Dunlop, in Bengal, met with mothers of 11 years. In this country the limit may be probably stated at 12 years, and pregnancy at an earlier period must be looked upon as highly improbable.

"The singular example of a lady who was a grandmother, was seen at the Ballston Springs about the year 1828, whose age was not quite 28 years. In the Transylvania Journal, (vol. vii. p. 447,) there is recorded the case of menstruation at one

year, and pregnancy at nine. The girl was delivered on the 20th of April, 1834, of a female child weighing 7 1-2 lbs., while she was aged but 10 years and 13 days.

"On the other hand, cases are recorded of pregnancy at very advanced periods of life. Bartholomew Moses mentions four cases of women pregnant in their 51st year, and Dr. Labatt of Dublin one; Knebel and La Motte each one in the 52nd year; Bartholomew Mosse and Knebel each one in the 54th year; a case of pregnancy at the same age (that of Mrs. Ashley,) is also related in the Edinburgh Annual Register, for 1816. In a French case, in which the succession to an estate was disputed on the ground of the mother being 58 years old when the child was born, a decision was given in favor of the fact. Pliny, Valescus de Tarenta, and Marra of Venice, record cases of pregnancy at 60; Capuron states that a woman of 63 was generally believed in Paris to have given birth to a daughter; and, lastly, Beck quotes a case from the Boston Medical and Surgical Journal of a woman at Whitehall (State of New-York) becoming a mother at 64.

"Instances are not unfrequent in this country, of the child-bearing faculty being preserved to the period of 50 years and up-

wards. Dr. Vandeveer, of Long Island, attended the accouchement of a lady in the 62d year of her age. Mrs. R. of this city was delivered of a child in her 55th year.

"Mr. Robertson states, that out of 10.000 pregnant females registered at the Manchester Lying-in Hospital, 436 were upwards of 46 years of age. Of these there were—

397	from	40 to 46	
13	in their	47th	year
8	"	48th	"
6	"	49th	"
9	"	50th	"
1	"	52d	"
1	"	53rd	"
1	"	54th	"

"In all question of this kind, the safest rule to adopt would be not to regard any case as worthy of implicit belief unless supported by one or more cases of the same kind; where a case stands quite alone, we are justified in viewing it with distrust, and in giving full force to all the objections that may be urged against it. If we adopt this rule in the question now under consideration, we shall be constrained to consider the age of 54 as the probable limit of fruitfulness, though we shall not be justified in denying the possibility of pregnancy

occurring at a more advanced age. Legal decisions may, in all these cases, be safely rejected, and the narratives of authors, unless they are very circumstantial, and contain some better evidence of age than the statements of women, may be received with scepticism.

"It is a common opinion that puberty occurs earlier in hot climates than in those lying within the temperate zones. Muller says, that it is stated that in the hot regions of Africa the changes of puberty take place in the female sex as early as the eighth year, and during the ninth year in Persia. With respect to negresses, Mr. Robertson, of Manchester, has published the following statement, obtained from the superintendents of the Moravian Missions in Antigua and Jamaica, by whom registers of births had been kept, the registry being important in fixing the date of the first appearance of the catamenia. Out of 21 cases, menstruation appeared in one aged 16, in three at 15, in three at 14, in three at 13, and in two at 12; while it had not appeared in one aged 14, in two aged 13, in one aged 12, in one aged 11, one aged 10, one aged 9, and two aged 8. In relation to the North American Indians, in whom, it has been believed, menstruation

occurs at a later period than among European nations, it has been ascertained that it happens at as early an age as among any other people.

"Instances of precocious puberty and menstruation are by no means rare. Sir Astly Cooper relates a case in the Medico-Chirurgical Transactions, Vol. IV., where the menses appeared at the 4th year of age; and another in the Lond. Med. and Phys. Journal, at three and a half. In these cases the female system was developed as at puberty. Dr. Francis (Ed. Denman's Mid. p. 223) records an instance at four and a half years of age, in which the pudenda and mammæ were similar to what may be seen at the ordinary period when the catamenia commence.

"It is stated that the celebrated Madame de Stael menstruated at 60. Richerand mentions an instance at 70 years. Magendie and Dr. Rush both relate cases of menstruation at the same age. Dr. Townsend has noticed a singular case of periodical discharge of blood in a male, which, for 39 years, supervened at every lunar month, and unaccompanied with pain.

DIFFICULTY OF DECIDING AS TO VIRGINITY.

"*The Hymen.*—Strange as it may appear, there has been much difference of opinion among authors as to the very existence of the hymen. Devergie and Beck both give long lists of those who affirm and deny its existence. Among the former are Dulaurens, Bohn, Dionis, Ambrose Pare, Palfyn, Pinæus, De Lamothe, Buffon, Fallopius, Vesalius, Columbus, and Mahon; among the latter, Zerbus, Fabricius, Riolan, Rigmore, Albinus. Ruisch, Morgagni, Winslow, Haller, Desault, Diemerbroek, Heister, Gavard, Sabatier, Cuvier, Zacchias, Brendel, Teichmayer, Mayer, Blumenbach, Belloc, Boyer, Cloquet, Denman, Fodere, and Orfila. The latter class has the advantage both in numbers and authority.

Orfila states that he has examined more than 200 subjects, and has never found it wanting. Gavard, who devoted much attention to this subject, found it in the fœtus, in the new-born infant, in young women from 23 to 25 years of age, and in one of 50 years old. Bennach of Marseilles saw it in a woman of 60. Devergie himself has found it invariably present in new-born

infants, and has met with it in women of different ages exposed at the Morgue. Of these one was 65 and another 72 years old. The same author has twice observed the labia minora united through the whole extent of their free edge, and leaving above a small aperture corresponding to the meatus urinarius. In another case a false membrane existed internal to the labia minora, and closed the vagina, leaving above a small opening for the urine. On cutting through this false membrane, the hymen was found posterior to it quite perfect. Devergie concludes from a careful review of all his authorities, that the hymen is an almost constant formation, and that the differences of opinion which have existed in former times have arisen from the great varieties discoverable in its form and size.

"The most usual form of the hymen is that of a semilunar fold, bounding the entrance of the vagina below, and of which the extremities lose themselves behind the labia minora in the circumference of the aperture of the vagina, Its convexity is behind and its concavity before. Another form of the hymen is that of a circular membrane, perforated in the centre, and adhering by its entire circumference to the

opening of the vagina. In a third case the hymen fills up the entire orifice of the vagina, with the exception of a small opening above corresponding to the meatus urinarius. Lastly, the most unusual form is that of filaments of mucous membrane uniting the carunculæ myrtiformes. From all this Devergie concludes, that in 99 cases out of 100 the hymen is to be found, and recognizable by marked characters.

"At birth the hymen is limited in extent; little by little, and especially during the period which precedes puberty, it grows. Its free edge then becomes relaxed and folded, so that there is reason to believe that when the rupture takes place it is chiefly in its folds or depressions, and that it is in this way that the carunculæ myrtiformes are formed. These remnants of the membrane afterwards undergo changes, become hard, are rounded after child-bearing, but rarely if ever entirely disappear.

"In addition to these carunculæ myrtiformes, Boyer describes two projections situated posterior to the hymen, which are nothing more than the projecting extremities of the anterior and posterior columns of the vagina. The pyramidal tubercles with fringed edges, three, four, five, or six in number, as they form the remains of

the hymen, may be regarded as conclusive proof of the previous existence of that membrane.

"From what has been stated there can be little doubt of the existence, in by far the majority of females, of the hymen, in some one of the forms already described, nor can there be any difficulty in ascertaining its existence or its recent destruction by violence. The recent destruction of the hymen would, of course, furnish conclusive evidence of the recent employment of force, and if it co-existed with other marks of violence on the parts of generation and on the person of the female, there could be no reasonable doubt of the commission of a rape, as far as that crime can be proved by physical signs.

"On the other hand, the absence of the hymen, and the substitution for it of the carunculæ myrtiformes, would prove that the hymen had been destroyed at some earlier period; and supposing it to be alleged that the female previous to the accusation of rape was a virgin, this circumstance might be thought to disprove her assertion. It is scarcely necessary, however, to state that the hymen may be destroyed by other force than that employed in sexual intercourse: from within, if the

aperture be small, by the first menstrual flux, or by the accumulation of other discharges; from without, in consequence of accident, or by the intentional introduction of foreign bodies for lascivious purposes. The membrane may also be destroyed by disease, or it may be originally wanting, as in a case related by Capuron. The absence of the hymen, therefore, is no proof that a female has had previous sexual intercourse.

"On the other hand, the presence of the hymen must not be accounted a certain sign of chastity, inasmuch as sexual intercourse has taken place, and children have been born, and yet the hymen has remained intact. Thus Ambrose Pare tells us of a mother who applied to him to examine the membrane, and on dividing it, it was seen to be of the thickness of parchment. Ruisch relates a similar case of a female during labor, in whom he had to divide not only the hymen, but a second membrane placed farther back; and immediately after the operation the child was born. Capuron also relates a case where the expulsion of the child was powerfully impeded by the resistance of the hymen. He incised the membrane, which had naturally but a small aperture, and shortly after a pair of

large and lively children were born. Baudelocque quotes the case of a woman whom he delivered, and whose hymen he was about to rupture, had not the head of the child saved him the trouble. Lastly, Tolberg quotes a case observed by the elder Meckel, and illustrated by a drawing: here a woman preserved her hymen circular and tense after having given birth to a fœtus of five months, enveloped in all its membranes.

"The presence of the hymen, then, is no proof of chastity, nor is its absence evidence of the reverse. At no time a sign of any great value, it is now become less necessary than ever to insist upon it, as proof of penetration is held to be complete even where the membrane remains intact. It is only necessary to add, by way of explaining the apparent anomaly of its existence in married and pregnant females, that there is naturally very great difference in the size of the parts of generation in different females, and that at the menstrual period and during delivery they undergo a very considerable degree of dilatation, and are so relaxed as to admit the passage of bodies of considerable size in both directions. The effect also of habitual discharges in causing a relaxed state of the parts must not be overlooked.

"Besides the intact condition of the hymen, other signs of virginity have been enumerated, as the fresh color, firmness, and elasticity of the labia, the entire state of the fourchette, the narrowness and rugose state of the vagina, and a plump and elastic condition of the breasts. The difficulty attending intercourse, the pain which the female suffers, the rupture of the hymen and the flow of blood, have also been mentioned as signs of previous virginity. All these signs are fallacious. The condition of the labia already described is not destroyed by repeated acts of intercourse, and in the state of the breasts many widows and mothers may compare with undoubted virgins. The fourchette may remain unruptured after repeated intercourse, and even after child-bearing; and the narrow and constricted state of the vagina is not only not peculiar to virgins, but it may be artificially imitated by the use of astringents, whilst the opposite state may be induced by the leucorrhœal discharge, or by profuse menstruation. It is also present, as has been already stated, during the menstrual period. As to the other supposed signs of virginity, viz. the difficulty of a first connexion, the pain alleged to attend it, and the show of blood,—these are still

more fallacious, as all of them may occur from relative disproportion.

"The difficulty of ascertaining whether or not a female has had previous sexual intercourse, and the possibility of the usual signs of virginity remaining after long habits of unchastity, is well illustrated by the following case, related on the authority of M. Parent Duchatelet.

"'Several years ago, two young women of genteel appearance were attacked in the public streets by some young men, who called them gross and opprobrious names, and told the passers by that they were nothing better than common prostitutes. Some good-natured persons resented this conduct, and took the girls' part. A complaint was lodged on their behalf against their defamers, and the latter were summoned to appear before a magistrate. The defendants pleaded a justification, while the females, on the contrary, stoutly insisted on their purity; they even offered to submit to a personal inspection by a medical examiner,—which the opposite party dared them to do. A sworn inspector, a clever and conscientious man, was appointed by the magistrate, and the result of his investigation was this,—That it was totally out of his power to say anything certain

in regard to one of the females; she might or she might not be a virgin; but for the other, she *probably* had had some intercourse with men, but he could not assert the fact positively. The issue of the dispute I know not; but this is certain, that it subsequently came out that these same young women had actually been for some time entered on the registers of the police, and one proof of their being anything but virgins was, that they had both been, on several occasions, affected with the venereal disease.'"

CAN CONNEXION TAKE PLACE DURING SLEEP, WITHOUT THE FEMALE'S KNOWLEDGE?

"That a female may be violated during *stupor* produced by narcotics, there is no doubt; that a female, accustomed to sexual intercourse, may be violated during profound sleep, is also highly probable: but that a virgin should be violated during sleep may be held to be in the very highest degree improbable. In the absence of facts this is all that can be said on the subject; but that it may be a matter of doubt, is proved by the fact that the medical faculty

of Leipsic, in 1669, answered the question in the affirmative, and the juridical faculty of Jena, in the negative. Violation is here used in the sense of sexual connexion accompanied by a certain degree of force. When discussing the question of pregnancy, cases will be cited which go to prove the possibility of sexual intercourse which has taken place during sleep being followed by pregnancy, which event has come upon the female by surprise—a proof that connexion was not accompanied by violence.

"In the year 1840, I was consulted by a poor woman who, after mentioning other complaints of little importance, stated that she was somewhat alarmed by the fact of her sleep being so heavy that she was with difficulty aroused. She added, by way of illustration, that her husband had assured her, that he had frequently had connexion with her during sleep."

CAN PREGNANCY FOLLOW RAPE, OR UNCONCIOUS CONNEXION?

"The facts just referred to prove that pregnancy may follow unconscious connexion, hence the venereal orgasm is not a

sine qua non of conception. It is also admitted that pregnancy may follow a first intercourse with consent; hence there is nothing in the nature of a first connexion to prevent conception. The question, therefore, becomes very simple. Is there in the aversion with which the female receives the forcible embraces any sufficient obstacle to conception? There is here not only an absence of all fact to guide us, but a preconceived notion, that pregnancy following alleged rape forms a sufficient evidence of consent, to mislead us. All that can be said, therefore, is, that it is in the very highest degree improbable that an event which may follow an act unconciously performed, and which is not prevented from happening by the suffering attending a first intercourse with consent, should be prevented merely by the repugnance which a female feels to the party offering her violence.

"Can a woman conceive while in a state of unconciousness? The answer to this question must be in the affirmative, for there is no doubt that a participation on the part of the female in the act of sexual intercourse is not necessary to conception, and as little doubt that intercourse may take place and the female remain quite un-

concious of what has happened. Capuron says, 'It is a fact which experience has more than once confirmed, that a woman may become with child while in a state of hysteria, under the influence of narcotics, during asphyxia, drunkenness, or *deep sleep*, and consequently without being conscious of it, or sharing the enjoyment of the man who dishonors her.' To prove the possibility of intercourse and consequent conception under the use of narcotics, the following cases may be cited: Capuron gives the case of a young woman who conceived during a deep sleep produced by punch given her by her paramour, and who became aware of her condition for the first time when she felt the motions of the child in the fourth month. Another case of the same kind is mentioned by M. Desgranges in a letter to Fodere. He says, 'I am certain that it is possible for a female to conceive during sleep, by the fact of a young person who, in the midst of our revolutionary miseries (at Lyons) became the victim of the wickedness of a young man and one of his relations. He enjoyed her during the effect of a strong dose of opium, and she became pregnant without knowing it, and with the assurance that she had never exposed her-

self to the risk of it.' The following case is cited by Beck :—'A pregnant female in her last moments solemnly declared that to her knowledge she never had connexion, but that a person in the family some time previous had given her some wine to drink, after which she fell into a profound sleep. She was not, however, conscious of anything having occurred during that state, but mentioned the circumstance as probably explaining her situation.'

"As examples of conception taking place from intercourse during profound sleep, the following cases may be cited: 'A maid at an inn, who was always thought to be virtuous, and bore a good character, began to enlarge in a way which excited suspicions of pregnancy; she solemnly declared that she never had connexion with any man. At length she was delivered, and was afterwards brought before a magistrate to swear to the father; but repeated her former declaration. Not long afterwards, a post-boy related the following circumstance: that one night he came late to this inn, put his horses into the stable, and went into the house; he found all gone to bed except this girl, who was lying asleep on the hearth-rug, and without waking her he contrived to gratify his desires.' Dr.

Montgomery relates an analogous case, on the authority of Dr. Cusack: 'A servant woman, at an hotel in Neuagh, proved pregnant, and solemnly declared that she was not conscious of having had intercourse with any man. Suspicion, however, fell upon an ostler in the establishment, who subsequently acknowledged that he believed he was the father of the child; that having found the woman in a deep sleep from fatigue, caused by long continued exertion, and being kept out of bed two or three nights in succession, he had connexion with her, and as he believed, totally without her knowledge, as she did not evince the slightest consciousness of the act at the time, or recollection of its occurrence afterwards: the parties were married with mutual consent.'

"The possibility of conception taking place in consequence of unconscious connexion during asphyxia or apparent death, is proved by the following case: 'A young friar being on a journey, arrived at a house where they were about to bury a young girl, whom they believed to be dead. He proposed to pass the night in the chamber with the coffin and watch the body. In the course of the night, while examining the body, his passions were so excited by the

beauty still remaining, that he determined on satisfying them even under such circumstances. He departed early next morning, and in the course of the day, the apparently dead revived, proved to be pregnant, and at the end of nine months brought forth a child, to the great amazement of her friends as well as her own. The friar returned to the place about this time, confessed himself the father of the child, and married the mother, having procured absolution from his vows, which he had taken against his will.'

"It appears then that there are various states of the system accompanied by insensibility, during which connexion may take place followed by conception, the female being quite unconscious of what has happened. In the cases just quoted, it seems highly improbable that the act of intercourse was accompanied by violence, for had it been so, the females could scarcely have failed to suspect the real cause of the injury which they had sustained. This leads to the second question."

CAN A WOMAN BE IGNORANT OF HER PREGNANCY, UP TO THE TIME OF HER DELIVERY?

"It is obvious that in the case first quoted this is quite possible. A woman who is not conscious of having exposed herself to the risk of becoming a mother, would naturally attribute her enlargement, and all the symptoms of pregnancy accompanying it, to any cause but the true one. There is another case in which such ignorance is possible; and that is where the female has yielded to the solicitations of a lover in consequence of solemn assurances that under certain circumstances, connexion may take place without danger. Thus Fodere cites a case on the authority of M. Desgranges, in which a young girl, after resisting the repeated solicitations of her lover, yielded to his desires in a bath, under the assurance that in that situation she could not conceive. She became a mother, however, but appeared to remain ignorant of her situation till the last. M. Desgranges states that she always affirmed to him that the circumstance of the connexion having taken place in the water had removed all idea of pregnancy. There is also an opinion prevailing that a single act

of intercourse is unattended with danger; and another popular prejudice, that provided the act of intercourse is incomplete, and the hymen remains uninjured, impregnation is possible. Fodere states that many cases have occurred of females asserting that they were not pregnant up to the last, on the strength of the precautions which they had taken.

"Now in all such cases it is obviously possible that the female may attribute the symptoms of pregnancy to disease, and really believe what she so much desires should be true. But it is in the highest degree improbable that a woman who has had connexion under any circumstances should not have serious misgivings as to the real cause of her altered state, and as to the infallibility of the popular belief on which she had acted. In this, as in other things, the wish is father to the thought; and as the married woman, anxious for offspring, construes every unusual sensation into a sign of pregnancy, and makes serious preparations for the important event which is to crown her wishes, so the single woman, whose wishes all tend the other way, may sincerely attribute to any cause but the true one, every symptom of an event which threatens her with shame.

SUPERFŒTATION.

This curious subject of enquiry has already been a subject of explanation with us, and here will be found all the known and credible facts which throw light upon it.

"*Is Superfœtation possible?*—As this question has an important bearing upon legitimacy, it demands a careful examination. Superfœtation is defined as the conception of a second embryo during the gestation of the first, the products of the two distinct conceptions being born either at the same or at different times. Some light is thrown upon this question by more than one well-authenticated case in which a woman has been delivered of twins of different colors, and both of them fully formed. The two following are taken from many similar ones quoted or referred to by Beck: 'A female at Charleston, in South Carolina, was delivered in 1714 of twins, within a very short time of each other. One was found to be black, and the other white. This variety of color led to an investigation; and the female confessed that on a particular day, immediately after her husband had left his bed, a negro entered her room, and by threatening to murder her if she did not consent, had connexion with her.' This case is related on the authority of Buffon. The following case is mentioned by Dr. Mosely as occurring within his time at Shortwood estate, in the

island of Jamaica: 'A negro woman brought forth two children at a birth, both of a size; *one of which was a negro, and the other a mulatto.* On being interrogated upon the occasion of their dissimilitude, she said she perfectly well knew the cause of it; which was, that a white man belonging to the estate came to her hut one morning before she was up, and she suffered his embraces almost instantly after her black husband had quitted her.' A case still more remarkable than either of the foregoing is quoted from the Rev. Dr. Walsh's Notices of Brazil. 'It was communicated to me,' says Dr. Walsh, 'by the sargente Mor of the San Jose gold district (Brazil.) A Creole woman with whom he was acquainted in the neighborhood had three children at a birth, of three different colors, white, brown, and black, with all the features of the respective classes.' In the first two cases there is nothing very remarkable. It is easy to imagine conception taking place in the same ovary or in different ovaries, from the nearly simultaneous application of semen whether of the same man or of different men.

"It is remarkable, that none of these cases, in which children of different colors (were the product of one birth) were attended or witnessed by medical men, but depend for authenticity on popular report, and some of them, as Dr. Chapman has remarked, (Eclectic Repertory, vol. I, p. 375,) carry wiih them internal

evidence of condemnation; 'There could not,' says he, 'under the alleged circumstances of the connexion, be a *white* and *black* child, but *one* must have been a *mulatto*, according to the invariable result between the negro and white!' Such cases, however, if substantiated, would not be instances of superfœtation, which supposes the children to be of different ages and sizes, but were probably of *contemporaneous conception.*

"Now these are cases in which the two children are of the full size, and differ in nothing but color from children of one father and one conception. There is another class of cases equally easy to believe and to understand, in which the birth of two children is separated by a short interval, or by an interval closely corresponding to their respective size and degree of development, on the supposition of their being twins. Of the former class of cases the following, taken from the *Consilia* of Zacchias, is an example:—'J. N. Sobrejus lost his life in a quarrel, leaving his wife pregnant. Eight months after his death she was delivered of a deformed child, which died in the birth. Her abdomen remained large, and it was suspected that a second infant was contained in it, but all efforts to procure its delivery proved fruitless. One month and a day thereafter, the widow was again taken in labor, and brought forth a perfect living child. The relations of the husband

contested its legitimacy, on the ground that it was the fruit of a superfœtation, and Zacchias was consulted on the subject. He agreed that the two infants could not have been the product of one conception, since the interval between their birth was so great: but advanced it as his opinion, that the *first* was the product of a superfœtation, and conceived a month after the other. This he strengthened by the fact that the husband died suddenly while in a state of perfect health. His opinion preserved the character of the mother, and also gave her those legal rights to which her situation entitled her.' Zacchias seems, in this ease, to have chosen the most improbable of two suppositions. It is certainly more easy to suppose that the birth of twins, the product of the same coneeption, may take place at two different times, than that they should be the products of two different conceptions; and it is by no means easy to understand on what data Zacchias could found his opinion that the child first born was the last conceived. In a question of so much difficulty, the wisest course seems to prefer that interpretation which involves the least difficulty, and which is most consistent with experience. Now the expulsion of twins ot different times is allowed to be a common event, of which examples are to be found in most works on midwifery. The most feasible opinion, then, seems to be, that this was a case of twins conceived at the same

time, but of which one was discharged before the other.

"Such, indeed, is the nature of most of the cases which have been recorded as instances of superfœtation. For example, in the Am. Jour. of Med. Sciences, (vol. xx. p. 481,) a case, headed 'Superfœtation,' is quoted from a German Journal, in which a female, æt. 35, who had been married eleven years, and the mother of four children, was delivered on the 16th Oct. 1833, of a female infant, fully developed; and on the 18th Nov. following, 33 days subsequently, gave birth to a second daughter, also fully developed, but feeble. Such instances are not uncommon, but they are not strictly cases of superfœtation. A dead fœtus may be retained in the uterus many months without apparent change or decomposition. We have extracted a fœtus which had been thus retained over a year; and Dr. Cheston, of Chester, England, has recorded a case, where a dead fœtus remained in the uterine cavity over forty years. In cases of twins, moreover, the growth of one may, from some cause, be retarded; while that of the other proceeds, at the usual rate of development.

"But there are cases on record which do not admit of so easy an explanation, and which certainly countenance the theory of a double conception.

"'The wife of Raymond Villard, of Lyons, married at the age of twenty-two, and became

pregnant five years thereafter, but had an abortion at the seventh month, on the 20th of May, 1779. She conceived again within a month; and on the 20th of January, 1780, eight months after her delivery, and seven months from her second conception, she brought forth a living child. This delivery was not, however, accompanied with the usual symptoms—no milk appeared, the lochia were wanting, and the abdomen did not diminish in size. It was accordingly found necessary to procure a nurse for the child.

"'Two surgeons visited the female, and were at a loss with respect to her situation. They called Dr. Desgranges in consultation, who declared that she had a second child in the womb. Although this was strongly doubted, yet, three weeks after her delivery she felt the motions of the fœtus; and on the 6th of July, 1780, (five months and sixteen days after the first birth,) she was again delivered of a living daughter. The milk now appeared, and she was enabled to nurse her offspring.'

"It is not possible, adds Dr. Desgranges, that this second child could have been conceived after the delivery of the first, for no sexual intercourse took place between the husband and wife till twenty days after, which would have made the age of the second child only four months twenty-seven days.

"The narrative of this case was accompanied by a legal attestation of it under the oath

of the mother; and on the 19th of January, 1782, both children were still living.

"Assuming that the facts of this case are correctly stated, it must be admitted to be nearly conclusive as to the possibility of superfœtation; for if we deny this, and assume both children to have been the product of a simultaneous conception, and the last child to have been at full term, the first child, which, be it remembered, in common with the other, survived its birth between one and two years at the least, must have been born alive at three months and a half; or, if the first child be admitted to be seven months old, the second must have been born alive at six weeks, which is obviously absurd. The only other possible supposition is also in the highest degree improbable, viz, that the second child was the fruit of sexual intercourse taking place subsequent to the delivery of the first. If such were the fact, a child born at about the end of the fifth month was reared! As no allusion is made to any peculiar difficulty in rearing the child, this supposition must be regarded as inadmissable.

"Dr. Matton has also related a well-authenticated case, in which two male children (both of which were 'born perfect') were brought forth at an interval of nearly three calender months. If this had been a case of simultaneous conception, the one would have

been six months or less, the other nine months or less.

"Additional cases are referred to by Beck, in three of which there was an interval of one month, in three an interval of two months, in one an interval of four months, and in one an interval of four days.

"In deciding this question, those cases only must be admitted to have any weight in which the interval between the births is considerable; for, where the interval is short, if we suppose the child last born to be mature, the first may have been eight or seven months old, which is quite reconcileable with the supposition of its being reared. When, however, the interval is one of four months, if we assume, as before, that the child last born is mature, the first cannot be more than five months old, an age at which it is in the highest degree improbable that a child could be reared.

"We have examined, we believe, all the instances of alleged snperfœtation which have been hitherto published, and with the exception of the case of Dr. Desgranges at Lyons, there seems to be little, if any, difficulty in explaining them all as examples of contemporaneous conception. Indeed, the case of Desgranges may be thus explained, if we but allow that a child of six months is viable, instances of which are not unknown, and two of which occurred in the practice of Dr. Boyd, of this city; in one, the infant lived three days, and

in the other, several weeks. Dr. Francis has also recorded two instances, (See *Stewart's Billiard, Appendix*, p. 611–12,) which happened within his own practice; in one of which, the child was born the 23d week of pregnancy; in the other, iu the 20th week; in the latter case, the infant lived but one hour; in the other, it is still living, (1843.) Dr. Rodman, likewise, (*Ed. Med, & Surg. Journal,*) has recorded a case, in which the child survived, though born in the 19th week of pregnancy. We should also bear in mind, that a disordered condition of the cord, impairing the fœtal circulation, will impede the growth and dimensions of the fœtus; an instance of which kind occurred to the venerable Dr. William Barrow of this city; where the fœtus, though born between the seventh and eighth month of gestation, weighed but little over five ounces. This preparation is now in the collection of Pathological Anatomy, in the Museum of Geneva College, N. Y.

"In any cases that may hereafter occur, it will be important to observe the size and degree of development of the children, as this must always be an essential element of the inquiry. But it must not be forgotten that even the products of the same conception may differ greatly in size, and yet both be healthy children.

"This fact is well illustrated by a case brought under my notice by Mr. Streeter, in

which female twins, five and a quarter months old, were born enveloped in a common chorion. The one was more than twice the size of the other, but the smaller fœtus alone had made successful efforts to respire.

"If the single case of the wife of Raymond Villard be allowed to be correctly stated, the doctrine of superfœtation must be admitted to be highly probable; but, as there may still be room for doubt, it may be useful to subjoin the chief arguments employed by the advocates and opponents of that doctrine.

"The opponents of superfœtation allege that the occurrence is impossible, because, 1. Shortly after conception the os tincæ, as well as the internal apertures of the Fallopian tubes, are closed by a thick tenacious mucus. 2. The membrana decidua, which is also formed soon after conception, lines the uterus, and aids in obliterating the openings into its cavity. 3. That when the uterus is impregnated, the Fallopian tubes, instead of running horizontally to the ovaria, lie parallel to the sides, so that if a second embryo were formed within the ovarium, the tubes could not embrace it in order to convey it to the uterus. And 4. That the arrival of a new embryo in the uterus would prove destructive to the first.

"The last objection is founded upon a bare assumption, and may therefore be summarily dismissed. The third objection, if valid, must prove fatal to the doctrine of superfœtation;

but though this obstacle may exist in the fully developed uterus, the ovary and Fallopian tubes are not more prevented from coming into contact with each other in the early stage of utero-gestation, at which alone superfœtation is alleged to take place, than in the unimpregnated state. The answer to the first two objections is an obvious one. Neither the tenacious mucus nor the newly-formed decidua, though in contact with the orifices and cells of the uterus, adheres so firmly to it as not to admit the passage of the aura seminis, or even of the semen itself. The fact of menstruation in numerous cases occurring during a part or the whole of pregnancy seems to prove, that the adhesion of this tenacious mucus and of the decidua is by no means so firm as to forbid the passage of fluid; and this argument is strengthened by the frequent occurrence of hæmorrhage in the advanced stages of pregnancy in consequence of partial detachment of the placenta. The arguments advanced against the doctrine of superfœtation are certainly not of weight sufficient to set aside such cases as those already adduced? and until those cases can be shown to be untrustworthy, we have no alternative but to admit the truth of the doctrine.

"If, then, we admit the possibility of superfœtation, the question arises, Can we explain this occurrence in such a manner as to avoid the objections of its opponents? The exist-

ence of double uteri, and more rarely of double vaginæ also, suggests the required explanation; and as the recorded cases of this malformation are much more numerous than those of superfœtation, it is quite possible that some of the latter may be explained by the malformation in question.

"That this malformation does really explain some cases of superfœtation is proved by a case related by Scheider of a woman who, six weeks after marriage, bore a four months' child, and forty weeks after marriage mature twins. On examination, the uterus and vagina were both found double, and each vagina had a separate orifice. It must be recollected, however, that this is a solitary case of the co-existence of superfœtation and a double uterus. Though some other cases may possibly have depended on the same malformation, there is no reason to believe that this was the case in all."

CAN PREGNANCY RESULT FROM A SINGLE COITION?

I am myself very dubious as to impregnation following a first connexion in a virgin, but still I cannot declare it impossible. It is probable that Masturbation, if not carried to excess, may so prepare the organs in a virgin

as to make her conceive from a first coition. This practice in fact would have nearly the same effect, in that respect, as actual connexion.

"Dr. G. C. Howard testifies, that 'conception would not follow one connexion, under the circumstances sworn to by Miss Murdock, once in a hundred thousand cases. In fact,' he remarks, 'I do not believe the instances ever occurred in the world.' Dr. Thomas L. Everett testified, that he 'deemed it impossible for a man to have complete connexion with a virgin, without producing laceration and some considerable loss of blood; and that a single connexion with a virgin would not produce conception. Such consequence is impossible. I have very little faith,' he says, 'in such result from a single coition between any parties, however much they have been accustomed to sexual intercourse with others!'

"Drs. Elwood, Strong, Ely, Backus, Smith, and Long, tesiified, that 'the ordinary period of gestation was forty weeks, or two hundred and eighty days; that variations of a few days over or under that period were frequent; that they should not consider it very extraordinary if it exceeded that period ten days, although it would be unusual; that there were cases in the books which showed that the period of gestation had been prolonged to three hundred days, and some even over that. They also concurred in saying that they knew of no phy-

sical impediments from conception following the first coition, although the probabilities would be against it; that they thought the probabilities would be against conception from any single act of coition, but not much more from the first act than from any later one, when the health and age of the parties favored conception; that they knew of no physical reason why conception might not follow when the connexion was forcible, as the mind, in their opinion, had nothing to do with the matter. They also concurred in saying that young females, with their first child, were more likely to fall short of, than to exceed, the usual period of gestation,"

"Impregnation has often followed a single act of coition, both in the virgin and in the married state; and it is a well-known fact, the same occurs, as a general rule, among the inferior animals. It is absurd to say that such a result is '*impossible.*'

"Dr. Dewees relates the following case. 'The husband of a lady who was obliged to absent himself many months, in consequence of the embarrassment of his affairs, returned one night clandestinely, his visit being only known to his wife, her mother, and myself. The consequence of this visit was the impregnation of his wife. The lady was at this time within a week of her menstrual period; and as this did not fail to take place, she was led to hope she had not suffered by the visit of her husband.

But her catamenia not appearing at the next period, gave rise to a fear that she had not escaped; and the birth of a child, nine months and thirteen days from the time of this clandestine visit, proved her apprehensions too well grounded.' (*Dewees' Midwifery, p.* 129.) A parallel case is related by Desormeaux. (*London Medical Gazette, Dec.* 1819, *p.* 344.) A similar case is mentioned by Dr. Francis. Dr. Beck remarks, that 'it is quite common, in cases of seduction, to swear that there has been only a single coitus; and although this may be doubted in some, yet in others there is hardly just ground to disbelieve a solemn affirmation.' (*Med. Juris. vol.* 1, *p.* 150.) Dr. Gooch in giving in his evidence in the *Gardner Peerage cause*, stated, that 'the exact duration of pregnancy could be accurately calculated in cases where respectable females had been seduced, and *the intercourse had been single*, the evidence of this being the oath of the female, there being no motive whatever for misstating the fact.'"

FACTS AND CASES CORROBORATIVE OF THE THEORY OF IMPREGNATION AS LAID DOWN IN THIS WORK.

Malformation or defect of the penis.—"In this place it is necessary to premise that it is

now generally admitted, that impregnation may take place, provided the semen be introduced within the orifice of the vagina; it will also be shown, when speaking of the possibility of impregnation taking place in a state of unconsiousness, that the venereal orgasm is not essential to render sexual intercourse fruitful. Small size or partial mutilation of the penis, therefore, cannot be accounted as a cause of impotence. Provided what exists or remains of the penis is sufficiently large to admit of introduction within the orifice of the vagina, and there be no impediment to the emission of semen, fruitful intercourse may take place.
Thus a removal of the glans penis, of the corpora cavernosa, (as in the case quoted by Dr. Paris from Piazzoni,) or of a very considerable portion of the organ, (as in the case of a soldier quoted by Frank, in whom a large part of the penis was carried away by a muskstball,) did not produce impotence. A still more extreme case is related by Mr. Hurd, in which, in consequence of disease followed by amputation, there was only a very small protrusion of the organ on pressure, and yet the patient after the amputation became the father of two children. An amputation of the penis close to its root would in all probability cause impotence, though for the reasons already assigned, fruitful intercourse is perhaps not altogether impossible.

"For the same reason, the opposite malfor-

mation, viz. an excessive development of the penis, whether normal or as a consequence of disease, can scarcely be regarded as a cause of impotence, inasmuch as though intercourse, in the ordinary sense of the term, were impossible, still impregnation might take place.

"Another malformation of the penis (*hypospadia*) was described in the last chapter. Here the urethra opens either upon the penis, behind its usual situation, or in the perineum. In most of these cases, the question of impotence admits of easy solution. When the orifice of the urethra is situated on the penis itself, especially on those parts of the organ which would be introduced into the vagina during sexual intercourse, the party cannot be accounted impotent. Several cases of this kind are recorded. 'Belloc says that he knew a person at Agen, in whom the orifice was at the bottom of the frænum, and who had four children resembling their parent, and what is still more remarkable, two of them had the same malformation.' Frank has seen a case of this sort transmitted through three generations.

"Dr. Francis witnessed a similar case of malformation in this city, in which the procreative powers were entire, and the peculiarity transmitted to the child.

"Kopp saw a peasant near Hanau with five children, in whom the opening was 11½ lines from the extremity of the glans. Dr. Blun-

dell says, 'I know an individual, the father of a very fine child, marked strongly with the paternal resemblance, and in this person the urethra opens in the corpus spongiosum, between one and two inches of the glans.'

"Beck has collected seven other cases of hypospadians who had children.

"In the cases now quoted, the orifice of the urethra was situated upon the penis: in other rare instances the opening of the canal is in the perineum. It is obvious that in such cases, provided the penis be well-formed, nothing more is necessary in order that fruitful intercourse may take place than that the semen should be introduced into the vagina. Sir Everard Home has published an interesting case of fistula in perineo, in which the celebrated John Hunter accomplished this purpose by causing the semen to be injected by means of a syringe immediately after coition. The wife afterwards proved with child, and Mr. Hunter entertained no doubt of the impregnation having been due to this cause. Spallanzani's experiments upon animals were instituted, according to Sir E. Home, several years after this proposal of Mr. Hunter, and were attended with success. This fact should render us cautious in giving an opinion in cases of supposed impotence; for it is possible that the semen which has been ejected from an opening remote from the penis may come into contact with the mucous membrane at

the orifice of the vagina, and thus cause impregnation.

"Another cause of impotence, about which less difficulty exists, is the malformation already noticed under the head of doubtful sex, viz. *epispadia*. Here the orifice of the urethra is above the penis or prostate; and as it is extremely improbable that the semen can be introduced into the vagina, such persons must be impotent, unless, as in the case just related, artificial means are resorted to. In some of these cases, the penis is entirely wanting, in others bifid, and in almost every instance unusually short.

"That impotence is not the natural consequence of such a malformation, may also be inferred from the fact that it has repeatedly occurred in cases where the hymen has not been ruptured, and there has been no penetration. 'Four impregnations,' says Dr. Blundell, 'in which the hymen remained unbroken, have fallen under my notice; the diameter of the vaginal orifice not exceeding that of the smaller finger, and this, too, though the male organ was of the ordinary dimension.' And again, 'I know of three cases in which the male organ was not suffered to enter the vagina at all, and where, nevertheless, I suppose, from the mere deposition of the semen upon the vulva, impregnation took place.'

These cases all prove that if the semen be deposited in the Vagina, or even in the Lips,

it may impregnate. The Law respecting *Rape*, also admits the same, for according to this the smallest possible penetration, even though the Hymen be not ruptured, constitutes a rape: because, if the female be old enough, impregnation may result from it. The crime is the same however whether there be emission or not.

HOW FAR DEFECTS OF THE TESTICLES MAY AFFECT A MAN'S VIRIBILITY.

"*Defect or Disease of the Testicles.*—The loss of both testicles early in life occasions impotence; where they are removed after puberty, the question may arise whether the party is necessarily rendered impotent. That sexual intercourse may take place for a considerable period after the removal of both testicles, is proved by a case related by Sir Astley Cooper. For about twelve months after the loss of the second testicle he had emissions in coitu; after that period coitus at distant intervals, but without emission; sexual intercourse became less and less frequent, till it ceased entirely at the end of ten years. Sedillot cites a case on the authority of Boyer, in which, after the removal of both testicles, a man became a father; and Beck states that similar results have occurred with animals recently

castrated. Otto, too, mentions one case in which he found plenty of apparently good semen in the vesicula seminalis of a man who had castrated himself a year before, in a fit of melancholy.

"Much unnecessary discussion has arisen as to the possibility of a man having only one testicle being capable of fruitful intercourse, and as to the impotence of persons in whom the testicles have not yet descended. With regard to the question of impotence: in cases where there is only one testicle, it is only necessary to observe, that, as impregnation cannot be supposed to depend upon the quantity of semen introduced into the vagina, we may safely affirm that one sound testicle is to the full as efficient as two. So also the mere position of the testicles cannot be reasonably supposed to alter their functions; it is therefore unnecessary to inquire whether those in whom the testicles are situated in the abdomen or in the inguinal canal are capable of procreating their species. If we can discover the testicles either in the scrotum or in the groin, and we have reason to believe that they are healthy and well-formed, we may safely decide that the parties are not impotent. If the testicles are to be found neither in the groin nor in the scrotum, our opinion must be founded on the general appearance of the body, the sound of the voice, the growth of the hair,

&c.; and these cases are the only ones which can present any difficulty.

"The question of impotence has sometimes been raised in cases in which the testicle is unusually small. This is not a sufficient ground for inferring impotence. Thus, though Dr. Baillie relates the case of a middle aged man, in whom the size of the testicles did not exceed that of the extremity of the little finger, and there was a total absence of sexual desire, the following case, given on the authority of Mr. Wilson, shows that we are not always justified in regarding such persons as impotent. 'I was some years ago consulted by a gentleman on the point of marriage, respecting the propriety of his entering into that state, as his penis and testicles very little exceeded in size those of a youth of 8 years of age. He was 26, but had never felt desire until he became acquainted with his present wife. Since that he had experienced repeated erections, with nocturnal emissions. He married, became the father of a family, and those parts, which at 26 were so small, at 28 had increased to the usual size of those of an adult man.'

"We not unfrequently meet with cases of *arrest of development of the testicle*, where in an adult, they are no larger than in a boy of 6 or 7 years of age. In such cases, the individual presents the appearance of a person void of sexual characters. There are no beard, or whiskers, and no hair on the pubes.

Curling mentions cases where one testis in an adult weighed but two scruples and one grain, whereas the average weight of a fully developed testis is six drachms, In these cases, moreover, there are no spermatozoa in the seminal fluid. Where a testis weighs less than three drachms. Mr. Curling thinks it must be regarded as in a state of atrophy. Where a testis is undergoing the process of wasting, not arising from disease of the gland, it usually preserves its shape, but feels soft, having lost its elasticity and firmness. The epididymis does not usually waste so soon nor in the same degree as the body of the testis."

SPONTANEOUS GENERATION.

This subject has already been referred to in the Chapter on Theories of Generation; to do full justice to it would require more space than the present work will allow. It is but just however that I should state the facts that many scientific men are decidedly of opinion that it is possible. It is true that we odinarily see Generation carried on in some one of the models I have described, nor is it possible to refer to any instances which are conclusive to the contrary. Still there are many curious cases in which Life has been originated, apparently, without the agency of similar beings

previously existing, and many strong arguments are adduced on this side of the question. The production of Insects by Galvanism, in the experiments of *Mr. Crosse*, the appearance of new Animals, and Vegetables, in places where they were previously unknown, merely by some change in the circumstances of the place, are particularly insisted upon. This Question has been in fact too little studied, at present, to enable us to arrive at any certain decision; it is however deserving of much more attention than it has received. I consider it myself to be of great interest and importance, and earnestly deserving of consideration, but as my purpose is simply to state the facts concerning the ordinary process of Generation, which we know to occur, I must pass this topic by.

Those who wish to see the subject fully treated should read the "*Vestiges of Creation*," in which it is ably discussed. For my own part I offer no particular opinion of my own, because I have not facts enough to base it upon; I am disposed to seek for data, and to suspend my judgment till sufficient has been obtained to guide me.

FINIS.

Lehman