Thesis on Reproduction by George R. Stewart 1857
Reproduction may be defined to be that process by which an organized structure is enabled to withstand the ravaging effects of decay & death, by the formation of a new structure to occupy its place, after itself has become exhausted.

The whole animate creation is subject to continual change. An act of life cannot be performed without involving the destruction of texture; & hence, were no compensatory forces in operation, the stillyef of death would soon prevail. There are, however, such forces & they are in constant operation to make up for the equally unceasing causes of dissolution. They are exemplified in the deposition of fresh particles of muscle, in the room of those which exercise has rendered unfit for further service; in the replacement of exhausted nervous matter by that newly formed; & in short, in the growth & restoration of every tissue, as well as in the formation of every organism.

But it is not in this extended sense that I propose to treat the subject. I shall confine myself to the consideration of it as instituted for the preservation of a supply of new individuals, & not as contributing to the renovation & support of one already in existence. In both cases, however, the process is the same in nature, & consists, in the formation
of cells, which undergo development, according to the purpose for which they are destined.

This comparatively limited view is the one usually adopted of the term Reproduction; but, even with this restriction, much more would be comprehended than I could advantageously treat of, in the limited time I can devote to it; and I mean, therefore, still farther to confine myself to giving a sketch of it, as it occurs in human beings, merely mentioning the other kinds to be observed in other clades.

Before proceeding farther, it may not be improper to mention an opinion that, at one time, prevailed pretty generally, but which is now almost, if not altogether exploded. I refer to the idea that some living beings were capable of being generated without the preexistence of a parent to give them birth. This notion originated from the fact that many animals have been found in places where it was thought impossible that germs could have penetrated; and even under circumstances where it was considered that had any germs existed, they must have been destroyed by the processes to which they were subjected. Many animals, for instance, infest different parts of the human body,
as the intestines, the liver, the muscles, and even the eye. Now, it has been asked, how can these animals have had a parent; and from the difficulty in arriving at a knowledge of how a progenitor could have gained an entrance to such situations, it has been inferred that these beings are of spontaneous origin. Again, when a vegetable or animal infusion is allowed to stand for some time, at a certain temperature, it is found, on inspection, after a time, to have become pregnant with countless myriads of active and intricately organized animalcules, which, from the situation in which they originate, have been designated Infusoria. These, it has been said, have formed after the infusion has been subjected to a temperature, that must unavoidably have destroyed any living germs that might have contained. However, in these experiments, sufficient precautions had not been taken to prevent the objection being started that after the liquid had again cooled, ova may enter it from the atmospheric air; and other investigators, who have attended more strictly, to avoid all chance of ova gaining access, have failed to observe the animals generated.

Again, in regard to the Entozoa found in an-
Smalls, there are so many sources of fallacy, arising from the many channels by which germs may be conveyed into the interior of the body, that no one can affirm, with certainty, that they were not introduced. And, moreover, many cases are on record, which seem to invite this explanation. For instance, some Entozoa are peculiar to certain countries, & when an individual belonging to a different part of the world has visited one of these regions, it has sometimes happened, that, after his return to his native locality, he has become infected with the species of Entozoa indigenous to the place of his sojourn, while no instances are on record of a like event occurring in the person of one who had never shown himself in the country which he had visited. Is it not probable, that, by the journey which he took, he had become tenanted by the ova of these animals, which are met with as parasites in the inhabitants of the place, & that they, finding in him all the conditions necessary for their development, afterwards showed themselves?

Many of these creatures are so small that they cannot be perceived without the aid of a microscope, & of a still greater number is it true, that their ova are so minute as to be capable of entering even
the finest capillaries.

Indeed, the whole idea of Spontaneous generation depends on our ignorance;—on our incapacity to trace the operations of Nature. Our knowledge has so much increased already, that many instances which were formerly brought forward as indicating Spontaneous generation, are now known to be only examples of ordinary propagation from pre-existing individuals; and as our ignorance decreases, in a like ratio will the remaining cases of difficult explanation gradually disappear. That this is probable may be inferred from the fact, that in all cases which we are able to trace, both in the animal and vegetable kingdoms, the law holds that new beings can only take their rise from previously existing individuals of the same species; or, as Harvey expressed it, omne vivum ex ovo; although, in cases of Fissiparous generation, this statement is not literally true.

It tends to the same conclusion also, that most (if not all) of these animals possess distinct generative apparatus; that, where these are not evident, it may arise from the capability of each part of performing each and every function with which the individual is endowed;—which
We know to be the case in the lowest classes of plants & animals. Now, why should procreative power have been bestowed, where there was no necessity for it, which would be the case, if the beings in question were of spontaneous origin.

But, I must now proceed to notice shortly the different kinds of reproduction to be met with, dwelling chiefly on that followed in the case of Animal beings.

The various forms of Reproduction may be considered as three in number: - the Fissiparous; the Hemimparous, & the Sexual.

The first, or Fissiparous, is met with in animals lowest in the scale, chiefly amongst the Infusoria. - It consists of a separation or division of the body of the parent into two or more portions, each of which soon comes to equal size, & resemble in form, the original, as well as to be capable of performing the same functions.

The division may take place either transversely, as in the Monas, or longitudinally, as in the Vorticella. In both these animals, two segments only are formed; but, in others, as the gonium, the parent divides into four parts, each of which again undergoes a similar separation.
The gemmiparous mode of Reproduction occurs also among some of the Infusoria, in different kinds of Ctenozoa & Polyps, & in some of the lower Mollusca. It consists in the development of a germ or bud from the body of the parent, which may remain attached until fully developed, as in the case of many Hydatids &c., or, as occurs in the Sponge, it may be thrown off from the body of the parent in a rudimentary state; afterwards becoming evolved, when it has obtained a suitable spot for maintaining its independent existence. The germ may be formed either in the parenchyma of the parent's body, on its exterior, or in its interior; & in cases of the last description, a sort of gemmiparous reproduction also occurs, in order to permit the escape of the contained young.

The last kind of reproduction to be mentioned is that which has been designated the sexual, from the fact that two sets of organs are necessary for its accomplishment, & that these organs constitute the characteristic distinction between the male & female sexes.

Of sexual reproduction, again, there are two divisions, according as both sets of organs are situated on the
same individual, or as each individual possesses only one set. In the former case, it is Unisexual or Monocious; in those animals exhibiting this form, some have the power of self-impregnation, and are truly Hermaphroditic, as in the Holothuria, while in others, as the Helix, each clasp of organs can be exercised only in connection with the opposite set, performed by another individual; by mutual impregnation taking place. In the latter case, it is called Bisexual, because, in order to its accomplishment, the cooperation of two individuals of different sexes is required.

In the part of the female, the essential organ is the ovary, the function of which is to form small cellular bodies, called ova, which contain the germ of the new being, but require in order to their development to be brought into contact with, to receive an impression from the seminal fluid secreted by the male organs. In some animals, this contact is effected external to the bodies of both parents. This is the case in frogs and fishes, in which the female deposits the ova, and the male afterwards "sheds" his semen over them. In others, it takes place within the body of the female. After the ovum has been impregnated, or
has received the influence of the seminal fluid, it is, in many instances, as in Birds, expelled from the body of the Female; & its development goes on without any organic connection between it & its parent; the materials necessary for this purpose having been formed & thrown off along with it. This mode of Reproduction is designated Oviparous. When during its formation, the new being is attached to the Mother, deriving its nourishment from her, until it is capable of independent existence, it is called Viviparous. Another kind, styled Prooviviparous occurs when the Ovum is developed within the body of the Female, but does not adhere to it by any organic medium. It is seen in many fishes, in some reptiles, insects, & other animals.

The mode of Reproduction followed by Human beings is the Viviparous. Thence, I shall now describe it a little more in detail.

As already observed, two kinds of apparatus are required for the process, the Testes in the Male, & the Ovaries in the Female. These are the essential organs, but others, differing in different species of animals, are required for enabling their products to be brought into con-
The testes are two glandular bodies, of a flattened, oval, figure, suspended by the spermatic cord from the lower part of the abdomen, & enveloped by various coverings. They are, in the early embryo, abdominal organs, one being on each side, but, about the fifth or seventh month, they have generally reached an extra-abdominal situation, although it is somewhat later before they have descended to the full extent. In their descent, they carry before them a portion of the peritoneum, which constitutes one of their coverings, is called the tunica vaginalis. When first formed, they also bear a close resemblance to the corresponding organ of the female - both presenting a cellular structure; it sometimes even happens that the organ, on one side, is developed into a testis, while that, on the other, is converted into an ovary. At a later period, the testis is found to consist of a number of small tubes, tubuli seminiferi, very much convoluted, & anastomosing with each other, they are arranged into groups or lobules, separated from each other, by fibro-vascular membranes, running from the proper capsule of the organ, or tunica albugi-
ginea, to the Corpus highmoricanum or mediastinum testis. At the apices of these lobules, which are of a triangular form, with their bases directed to the surface of the organ, the tubules unite together to form larger ones. They are now no longer convoluted, but proceed in a straight direction, whence are called vasa recta. These soon end in a close network of tubules, named the rete testis, which terminates in fifteen to twenty larger ducts, at first straight, but afterwards contorted and arranged in conical lobules, named Coni Vasculosi. The Coni Vasculosi then join into one common duct, called the vas deferens. The vas deferens or excretory duct of the testis, is also at first much convoluted, and forms the Epididymis, but ultimately pursues a less waving course to its point of entrance into the urethra, at that portion where it is surrounded by the prostate gland. Before reaching the urethra, it is joined by a tube from the vesiculae seminales, which latter may, in some, be regarded as prolongations backwards of the vasa deferentia, in the form of a long blind sac, folded many times upon itself; but, in many of the lower animals, the two are quite distinct, and have no direct communication. The function of the testes is to secrete


the semen. This is a thick, opaque, whitish fluid, of a higher specific gravity than water, having a neutral reaction & a sharp astringent taste, & emitting a peculiar odour. This last, however, would appear not to be resident in the pure semen, but to be derived from some of the other secretions, with which it is mixed before its expulsion from the urethra. These secretions are those of the vesiculae seminales, of the prostate, & of Cowper's glands. The purpose they serve in preparing the secretion of the testes for fecundation is not known.

Like the blood, the semen consists of a fluid portion, containing in suspension granules & corpuscular elements. Some of these corpuscles are squamous & columnar epithelium cells, derived from the mucous canals along which the fluid is carried, but the majority of them are of a different character, & are characteristic of the secretion. They consist of oval flattened cellular bodies, with long filiform tails attached. From their minute size, they can only be recognized when a high magnifying power of the microscope is used, & hence, for a long time were unknown. - Leeuwenhoek was the first who directed
particular attention to them, though he was not the original discoverer. The merit of the latter title has been claimed by several, and it is not easy to decide to whom it is due. When the fluid submitted to examination has been only recently expelled, these structures are observed to be in rapid motion, the power of producing which resides in the caudal filament. The fact of their exhibiting this movement, as well as their resemblance in form to some of the infusoria, served, for a long time, to keep up the idea that they were distinct organisms endowed with all the attributes of animals. Hence the names of spermatozoa, spermatie animacules, which they bear. Now, however, that the mode in which they are developed has been ascertained, there is every reason to view them, not as separate individuals, or parasites inhabiting this fluid; but, (as Kölliker was the first to suggest,) as mere histological elements, bearing the same relation to the blood-corpuses, as the blood-corpuses do to the blood. Their evolution was observed by Wagner in the Sparrow. On withdrawing the seminal fluid from their testes, when the latter were enlarging for performing their
function, in the beginning of spring, he observed that it contained a number of round transparent vesicles, having a single nucleus. On examination, at succeeding stages, these nuclei were seen to increase in number, & at last appeared to resolve themselves into a fine granular matter, occupying the greater part of the interior of the vesicle. The granules, he thought, became arranged in linear masses constituting bundles of spermatozoa. Within the cell, which, at last, burst, & allowed of their escape.—Holliker's investigations into this subject were made on the semen of the rabbit; his observations differ from those of Wagner, inasmuch as he describes each division of the nucleus as itself a cell filled with fine granular matter; & that each spermatozoon was formed in a distinct cell, by the linear aggregation of the contained granules. Their union into fasciculi, he ascribes, in some cases to the bursting of the included nuclei in which they are developed, while the parent cell yet remains entire, & in others, after the latter has been dissolved to the natural tendency inherent in them to collect in this manner, as blood-discs
do in the formation of rouleaux.

Thus, it appears, that the spermatozoa do not multiply by self-propagation, but are developed on a plan so different from that which obtains in the case of animalcules, that analogy, on this point, would disincline us to believe in their being supposed of independent vitality.

Nor is their motion now at all considered as justifying the idea of their being animalcules, for there are many structures entering into the composition of animal & even of vegetable bodies, which display equally rapid, & otherwise wonderful, in short, an identical kind of movement, yet, which are never thought of being placed in any other rank than that of elementary parts of the organisms in which they are found.

The spermatozoa are devoid of organization, consisting of a uniform homogeneous substance, not presenting any arrangement into separate textures or organs, although at one time they were supposed to be very complicated, supposed of intestines & even generative apparatus. Indeed, some writers in former times went the length of regarding, as the germs from which the foetus is developed, as having all the parts which are
afterwards seen in the latter, on an exceedingly small scale.

That they are the essential parts of the semen is rendered extremely probable, from the fact of their being always present in it, in those male animals which are capable of procreation; that they are either absent or imperfectly developed in those which have not at that age when the power of procreation exists, & in hybrids, which have not the power of propagating themselves. But this is still further confirmed by the experiments of Prevost & Dumas on frogs. They filtered the seminal fluid of these animals, & so obtained the spermatozoa & liquor seminis distinct. On attempting to impregnate the spawn of the female with the fluid portion, they invariably failed, while they succeeded on trying with the spermatozoa. Besides, in some animals, there is none of the fluid portion, nor is it easy to see how it could avail in the case of aquatic animals, such as the salamander, in which the semen, when ejected from the male is diffused through the water, before coming into contact with the ovum.

The chief supporters of the doctrine that the liquor seminis is the essential part are Bichoff & Valentin; the function which they assign to the spermatozoa
is that of elaborating & conveying it to the ova; but for the reasons above assigned, the opposite view seems to be the right one. How it is that these animals operate in fecundation has been the fertile source of many theories, but it is still unknown. That they enter the ovum as described by Lovenhhoek, & as Martin Barry thought he had observed, is not now regarded as true; for lest that they are themselves the source of the new being. They are not infrequently observed as high as the ovarium, by those who conduct experiments on the lower animals, for this purpose; but may impregnate the ovum during any part of its course along the Fallopian tube. The agents in conveying them along the uteri & ducts are their inherent power of motion, & the action of the ciliated cells which line the parts they have to traverse.

What is even still more mysterious than their mode of action is, that their influence does not appear to be exhausted on the ovum which they impregnate; but extends to subsequent ova fecundated by the seminal fluid of another male. At least such is the opinion of some authors, founded on instances such as the
following: A mare, in the procreation of the Earl of Morton was covered by a male quagga. The foal which resulted I was striped like the quagga and bore other marks of its father. The mare afterwards became pregnant three times by horses, and in each of the offspring, distinct, though decreasing, marks of the quagga were visible. Many other instances of a similar kind in other animals, also in the human being, have been recorded. Other, or perhaps, better explanations of some analogous cases, at least, have, however, been advanced.

Some ascribe it to the imagination of the mother, I adduce a wonderful array of cases which would seem to show that this has, at all events, some effect in bringing about the result in question. Others have supposed that it is due to an inoculation of the mother by the foetus, which, possibly in part, the constitution and external features of the male parent. As bearing upon the latter hypothesis, the experiments of Magendie & Williams may be mentioned. They found that camphorated oil and other substances taken by the mother affected the foetus, but that poisons injected into the umbilical cord had no effect on the mother.
With the preceding very brief account of the part which the male performs in the process of reproduction, I must be contented, I shall now pass on to consider how the female contributes to it.

The generative organs of the Human Female have been divided into the External & Internal, or into the Reproductive & Reproductive. The internal ones are those essential to Reproduction, & hence, I shall restrict myself to a description of them. They are the Uterus, the Fallopian tubes, the Ovaries.

The Uterus is a dense fibrous organ, of a pyriform shape, situated in the cavity of the pelvis, & supplied with bloodvessels, lymphatics, & nerves. The first are rendered necessary to enable it to undergo the great enlargement which takes place after impregnation; the second are equally required to reduce it to its natural size after Parturition; while the third constitute the medium through which are excited those numerous off sympathetical affections which characterize the period of utero-gestation. The bloodvessels & lymphatics increase greatly in size, as the uterus enlarges during pregnancy; the same has been
affirmed regarding the nerves. Dr. Lee of London, is the chief follower of Liebigmann and Hunter in defending this view. He has given representations of them, as dissected by him in the gravid uterus, showing their greater magnitude, than even figured a meshwork of nervous filaments distributed beneath the peritoneum, undescribed by previous anatomists. It is generally believed, however, that this is not correct, that what he delineates is in reality, only the uterine tube, which he had mistaken for nerves, in making his dissection. In the unimpregnated state, the uterus weighs from an ounce to a half to two ounces, in the adult; it measures about three inches in length; two in breadth, at its upper part; one in thickness. It is divided into the fundus, body, and cervix, with a central cavity lined with mucous membrane, communicating with the vagina through the canal of the cervix. The os internum is the term applied to the uterine orifice of this canal, while the vaginal opening is designated the os externum, or os tineae. - External to the mucous coat is the proper tissue of the organ, in regard to which, it has been disputed, whether it is
Mucosal or fibrous. Many anatomists seem inclined to believe that it is composed of inorganic mucosal fibres similar to those of the bladder and intestines, while others consider the fibres are non-mucosal in the unimpregnated state, but that they become transformed into the striated variety of muscle as uterine gestation goes on. There cannot be a doubt that they are muscular at the time of parturition, for they are then felt to contract if the hand be introduced into the uterus; they have been even seen to do so in cases of Dolapans uterus in the human female, as well as in lower animals whose abdominal parietes have been cut through, for the purpose of ascertaining.

The fibres are arranged in three layers; the external somewhat longitudinal; the intermediate set coursing irregularly between the bloodvessels; the internal having a transverse direction. In the interior, there are two circular bands, one on each side, surrounding the extremity of the Fallopian tube, and, along with the convergence in the longitudinal fibres, as they proceed from above
downwards & inwards, indicating the lipid character of the uterus in an early stage, - a condition of it which is permanent in some of the lower animals.

This proper tissue of the uterus receives externally, on the greater part of the fundus body, a covering from the peritoneum, which passes from the parietes of the organ to the sides of the pelvis, forming the broad ligaments, or, as they have been called, the Alae Mesenteriunis. Along the latter, enclosed in their folds run the Fallopian tubes. These are about four inches in length, springing from the cornua of the Uterus, at the junction of the fundus body, - pursuing a winding course outwards at first, then backwards & downward towards the ovaries. The canal of each tube is so narrow at the uterine extremity as to be scarcely capable of admitting a bristle, but it widens as it proceeds to its abdominal orifice. It is lined with mucous membrane, continuous, on the one hand, with that lining the cavity of the uterus, & on the other, with the peritoneum, affording an exceptional instance of a serous & mucous membrane running into each other. Each duct has also three tunics, similar in nature & arrangement to those of the
Uterus. At the abdominal extremity, each is prolonged into a number of fimbriae, surrounding the opening of the canal, & constituting what has been designated the Morsus diabolic. One of the fimbriae of greater length than the rest is attached to the ovary.

The ovaries, or testes muliebres, are two oval compressed bodies, situated, one on each side in the posterior portion of the corresponding broad ligament. Each is composed of a lamellated fibrous tissue, called the Stroma, bis surrounded by two investments; one proper to itself, the Tunica albuginea; the other external to this, termed the Endospermum. Scattered throughout the stroma are found a number of vesicles or sacs, generally from fifteen to twenty, of various sizes, which, from Dr. Graaf having been the first to describe them minutely, have been called Graafian vesicles. They were, however, previously known to Rediarius & Fallopius; & more recently they have received, from Martin Barry, the more appropriate name of ovisae. Each has two distinct coats, the outer dense of fibrous, connected with the surrounding stroma by networks of bloodvessels, being in fact rather a portion of the stroma on-
densely around the inner tunic, which is thicker, softer, and more opaque, and has its internal surface covered by a layer of nucleated cells arranged so as to constitute what has been styled the Membrana granulosa. Enclosed by these coverings is a granular albuminous fluid, which contains the ovum. The latter is surrounded by a transparent ring, the zona pellucida, or vitelline membrane. Holding in its interior a map of granules and globules, which constitute the yolk or vitellus. Imbedded in the yolk lies the germinal vesicle, or vesicle of Purkinje, within which, again, is the germinal spot of Wagner.

Of these different structures, the Graafian vesicle is that first formed, & the mode in which it is so is described by Bischoff to be as follows: A number of primary cells form nuclei, if cells are at first observed, & these become aggregated into groups. The cells at the circumference of these groups coalesce so as to constitute the middle investment of the vesicle, while the inner portion of the map becomes fluid. In the interior of this follicle another layer is produced by the formation of new cells, while
the albuminous fluid, with its nuclei and granules, occupies the cavity. The next part observed by Bischoff was the germinal vesicle with the germinal spot, but, which of these two is first formed, he could not determine. Probably the finely granulated substance, which constitutes the spot, is the nucleus around which the vesicle is afterwards developed. Analogy would lead to this view, for the law which regulates the formation of other cells, whose formation can be traced from its very commencement, throughout all its stages, is that the nucleus is the first to make its appearance. Kölliker and Bagge have rendered it still more likely that this is the relation in which these two structures bear to each other, by observations which they have lately made on the development of the ova of some intestinal worms, in which they found this to be true. Around the vesicle, an accumulation of granules takes place, thus the yolk is produced.

At first, the germinal vesicle is in the centre of the ovum, the latter holds a corresponding place in the Graafian vesicle but, as they advance to maturity, each
approaches the circumference of its respective cavity, so that when a Graafian vesicle is ready to burst, the important structures which it contains, & which are to be evacuated, are at the most favourable situation for making their exit.

The change of situation of the ovum from the centre of the vesicle to its periphery has been supposed by Valentine to be connected with the formation of the Membrana granulosa. At an early stage, the vesicle consists of the ovum imbedded in a mass of granules without any fluid portion. The fluid, however, afterward shows itself in the centre, & as it accumulates, pushes the granules & the ovum to the circumference, thus forming the granular Membrane, & the thickened portion of it, called the Disenus proligerus, in which the ovum lies.

The functions of the uterus are to secrete the menstrual fluid, to contain the ovum during its development, & to expel it after it has arrived at maturity, that state in which it is able to maintain an independent existence. The period at which this organ
comes into exercise varies in women of different
countries, and in different individuals of the
same place. The average time at which it begins in women of this country is
from fourteen to fifteen years of age, while
the period of its ceasing ranges between the
forty-fifth and fiftieth years. In warm
climates it is somewhat earlier, but the
effects of temperature in causing this have
been exaggerated. It is hastened by luxu-
rious habits of life, which like causes, while
it retarded by opposite circumstances.
The menstrual fluid, after the age
of puberty, as a general rule, makes its
appearance every month, whence the
term applied to it. It is absent during
pregnancy, lactation, unless in exceptional
cases.

Many theories have been advanced
to account both for the purpose which
it serves, and the reason why it should occur
so regularly, and others are still wanting
to settle these questions. In explanation
of the former, the most generally accepted
opinion seems to be that it prepares the
utens for the reception of the ovum; while, in regard to the latter, nothing more is known than that such is the law ordained for its regulation.

The change which takes place in the uterus before the descent of an impregnated ovum, consists in a hypertrophy or thickening of its mucous membrane, to form what has been called the decidua vera. That the decidua of this nature, first, as Mr. Hunter and many others have supposed, an effused layer of coagulable lymph, is proved by the numerous foramina visible on its surface, which are the orifices of the tubules existing in the mucous membrane in its natural state. This change, it is believed, is begun at every menstrual period, because at this time an ovum descends; but it is only when the latter has been fecundated that this formation proceeds to any great extent. Sometimes it goes to a greater length than usual at the menstrual period, and gives rise to membranous hypomenorrhoea.
The exciting cause of the congestion of & effusion from the uterus, every month, is considered to reside in the ovaries, which become similarly affected at this time. This appears to be connected with the bursting of a Graafian vesicle & the escape of its ovum. After the latter has taken place, the breach of texture in the ovary, is repaired by the formation of a yellowish looking substance around either a Central Cavity, or a Scleriform fibrinous Cicatrix, - the whole constituting what has been termed a Corpus Luteum.

The situation in which the yellow deposit occurs has been variously stated by different observers, some holding that it is external to the coats of the vesicle, others that it is in the interior, while a third party consider that it takes place between the two, although they differ among each other as to what the intermediate locality is.

The Corpus Luteum grows to a larger size after impregnation; but is formed at every menstural period, few nor-
consider that they can determine by its appearance whether impregnation has or has not occurred.

There may be only one Corpus Luteum although two ova have been impregnated because a Graafian vesicle sometimes contains two ova.

After the impregnated ovum has made its escape, it passes along the Fallopian tube, which may be regarded as the excretory duct of the ovary. In its course along the duct, the ovum undergoes changes in its interior consisting, among other things, in the division of subdivision of the yolk, to form a number of cells, which by the time the ovum has reached the uterus, has given rise to the Blastodermic Membrane, in which the Foetus soon begins to appear.

But I cannot pursue the subject further. I regret exceedingly that want of time has prevented me from considering this interesting topic more in detail. I originally intended to have given a sketch of the development of the Foetus, but...
for the reason above assigned, cannot carry this intention into effect.

Seeing, however, the nature of what has been written, the want of any more will perhaps be regarded rather in the light of a fortunate circumstance, saving the infliction of continuing to read a paper containing a imperfect a sketch of what deserves to be so differently handled.

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