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ON

Physiology of Menstruation

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BY

Henry M Compton

OF

Texas

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To

J R Jennings M.D.

and

J M Watson M.D.

is this paper

justly and gratefully inscribed

by

The Author

Dear Sirs

Permit me to hope you will recieve this Dedication as a small but sincere testimony of that sense I entertain of your esteem; to merit and to enjoy which to the latest period of my existence, is the highest ambition of

your most humble servant

A. M. Compston,

The hand has often been considered the characteristic of man, that which distinguishes the human family from all other animals. From a casual observation, those who do not understand the works of nature, or rather of Nature's God, not being competent to compare the mechanism of man with that of those animals that approach nearest to him as we descend the scale of animal existence, man being regarded as occupying the highest position, seem to be astonished, when told, that the hand is the most distinct difference: But close dissections and comparative examinations force us to the conclusion, humiliating as it be, that man, that lordly being man, whose form erect, in part distinguishes

him from the grovelling herds of animated nature, anatomically considered, has but the hand, to which he can lay claim, as belonging to him exclusively.

Many have contended, that the construction of his brain was different; believing there were additional ganglions attached to this great association of nervous centers, which endowed him with mental powers not possessed by other animals; anatomical research, however has shown, that no ganglion has been added, and that the difference consists in this, some of the ganglions are increased in quantity, and possibly more highly organized; especially is this exemplified in the hemispherical ganglions, whose function is the elaboration of thought; and (I am almost tempted to add) are the seat of the soul; here I might-

have done myself injustice, as I regard them only as the organized Material, through which the soul, the immaterial part of Man, makes itself Manifest

While some of Nervous centers are enlarged; on the other hand, we find others greatly diminished, as an instance of this fact, I may mention the olfactory bulbs; Consequently many brutes are endowed with some special Nervous function in a much higher degree than Man.

When we regard Man in a physiological point of view, we notice many marked differences, all of which have a tendency to elevate him above the rest of animal creation; from the combined effects of these functions he is advanced to that lofty position, which enables him in truth to say—

"I am monarch of all I survey,
"My rights there are none to dispute;
"From the center all round to the sea,
"I am lord of the fowl and the brute."

No function assists more towards this promotion, than Menstruation. It is due to the quieting influence of this physiological process, that woman is enabled to controul her sexual desires and maintain her virtue. Acting as a local depletion, it subdues venereal excitement. Without it, woman burning with desire would be as prone to seek favours of man, as is the heifer labouring under the excitement of venereal orgasm to follow after the bull.

Concerning this process much has been writen; many experimental observations have been made, to establish the

numerous theories, which have been promulgated in regard to the manner in which this function is effected: Great diversity of opinion has prevailed concerning the cause of, what to ancient physiologists appeared to be a useless function.

The most lucid definition I can give of Catamenia, is that which I borrow from Dunglison. "The sanguineous evacuation from the uterus, the monthly occurrence of which constitutes Menstruation.

Before entering into the consideration of the physiology of this function, I will briefly review the anatomy of the Ovaries, Fallopian tubes, Uterus and Vagina, being the parts concerned in this process. I deem it highly important, that the minute anatomy of these parts, should

be well understood, to enable one to explain this function, more especially when I say that it is owing to the anatomical arrangement of the blood vessels of the uterus, that we can with any plausibility account for the hemorrhagic character of this discharge.

The Vagina is a cylindrical canal, four to six inches in length, situated within the pelvis, between the bladder and rectum. It communicates by one extremity with the Vulva, by the other with the uterus the neck of which it embraces, It is lined internally by a mucus membrane, which is loose and hangs in transverse folds called rugæ, Thro' are many glands imbedded in its substance, whose office is to secrete mucus to lubricate its walls, this mucus is acid in its reaction, It is owing to the chemical action of this acid mucus upon

the menstrual fluid, that it does not coagulate, Near the external opening of the vagina are many glands the orifices of which are often large enough to be seen with the naked eye; two of these larger than the rest one on either side, called the glands of Duverney, are analogous to Cowpers glands in the male, and are said to secrete a white mucus in considerable quantity during the act of coition, this discharge being the termination of the venereal orgasm produced by coition; instead of the ovaries discharging an ovum by the pressure of the fimbriated extremity of the fallopean Tube, by which means an half formed ovum might be forced from its nidus, the graphian vessicle

The Uterus is a pear shaped viscus

situated in the pelvic cavity behind the blad-
-der and in front of the rectum, having
the small intestines above, and attatched
to the vagina below. It is an inch thick
from befor back, and from side to side
at the upper part near two inches, dimin-
-ishing in width as it desends, termina-
-ting in a constricted potion, called the
cervix, to distinguish it from the rest
of the organ called the body.

This visous has a small triangular
cavity, opening into the vagina by the
os uteri; near the fundus on eather side
may be seen the opening of the fallopian
tube.

The walls of the uterus are thick, com-
posed of three coats or membranes, the outer
or serous, is but a reflection of the peritonæum,
which by its folds assists in giving suport-

to the organ. The middle coat has several peculiarities; in the unimpregnated state, it is grayish and elastic, of close fibrous structure filled with veins, which in the gravid uterus became sinuses, then the muscular fibre is well developed, and from this circumstance this coat has received the name of Muscular. The mucous or Mucous membrane is a continuation of the inner lining of the vagina, and is continuous with the Muco. serous Membrane of the fallopian tubes. Just within the cavity of the cervix, the Mucous Membrane loses its epithelial coat and gradually assumes the ciliary surface, the Mucous coat is thick, and filled with tubular glands, whose function is to secrete the Membrana decidua; after Menstruation the surface of the cavity

of the uterus is found dotted with minute points, which are the extremities of small arteries closed by valves; it is by the mann-er of this arrangement, that the maternal portion of the placenta is formed and supplied with blood, and also accounts for the profuse hemorrhages that occur frequently from this organ, which always partake of the character of arterial blood, from these small arteries the menstrual blood is poured out. The walls of the cavity of the neck are thickly studded with mucous follicules, which, when necessary secrete a thick, tough, gelatinous mucus that agglutinates the edges and so to prevent the escape of an impregnated ovum.

The mucus from the uterus is alkaline, and it may be due to the ammo-

-nia that it contains, that it is endowed with the power of becoming organized to form the Membrana Decidua.

The Fallopian Tubes are two in number, one on each side, they like the uterus have three walls composed of three Membranes, The inner coat being a continuation of the Mucous Membrane of the uterus, but also partakes of the Nature of a Serous Membrane. The Middle coat is Muscular, having its fibres arranged both circularly and longitudinally. The Outer or Serous membrane is part of the Peritoneum. These tubes are located along the upper border of the broad ligament of the uterus, they are four to five inches in length, being at each extremity open, the end distal

from the uterus, being called from its tas-
-selated appearance, the fimbriated ex-
-tremity, opens into the cavity of the peri-
-toneum, being the only exception to the
general rule, that serous membranes
are closed sacks.

The Ovaries are the testicles of the
female, being two in number, placed one
on each side; they are situated between
the fallopian tubes and the round liga-
-ments of the uterus, within the folds of
the broad ligaments, and are attached to
the uterus by a fibrous cord, the round
ligament of the Ovary. The outer sur-
face of each ovary gives attachment to
one of the muscular projections of the fim-
-briated extremity of the fallopian tube,
which acts as a gubernaculum, to direct
the tube to the ovaries during ovation.

The Ovary is composed of a close spongy texture, called stroma, which is filled with small vesicles containing a clear fluid, in which floats a minute granule, which when mature or fully developed becomes an ovum.

Having given a concise view of the anatomy of these parts, to explain the office of each, I will hastily run over the history of a sucessful coition; for I deem it necessary to understand the function that each part performs, to enable me to satisfactorily explain the process of Menstruation, which I regard as a consequence of the failure of some of these parts to perform their function, which failure is due to the want of the proper stimulation.

Immediately after coition in

which some of the spermatic fluid, containing healthy spermatazoae, is thrown to the os tincae, this fluid so stimulates the mucus surface as to cause the ciliary motion of the inner lining of the uterus, to be reversed in its action, before it was so conducted as to bear the mucus secreted within the uterine cavity, out through the os into the vagina, this ciliary motion being now changed in the direction of its actions, conveys the spermatic fluid up the uterus to the fallopean tubes, and also up them to their fimbriated extremities, unless it met with an ovum, which being mature, has been disengaged and is being conveyed out through the fallopean tubes.

When the spermatic fluid meet-

an ovum, it becomes united with it. Then its stimulating property is entirely changed, the action now excited is now directly reverse to that which both the spermatic fluid & the tubes.

The Uterus being a very sensative organ, well supplied with blood vessels and nerves, takes cognisance of the descent of the combined ovum and spermatazoad; and on account of the stimulation which they impart, it receives an increased supply of blood; the tubular glands, responsive to the impression made on them by this combined substance, perform an unusual amount of labour, pouring out a plastic Material, which immediately is organized into the Membrana decidua, this is to answer the purpose of a soft and safe bed for the

lodgement of this little atom of matter, which is even at this stage of development a human being in its incipiency. The action of the tubular glands is so energetic, that the uterus, though much congested, does not bleed and possessed of open extremities to its arteries, by which it might relieve itself of this surplus of blood, still from the quantity and quality of this plastic secretion, the orifices of the arteries are closed, or if they bleed, the blood they transmit enters into the formation of the decidua membrane, which lies closely adherent to the walls of the cavity.

Having given a cursory view of the anatomy of these parts, and of their functions in the beginning of pregnancy, I will now attempt to explain the phy-

-diology of the process of Menstruation.

Some physiologists regard the Menstrual fluid as a secretion; others as a modified hemorrhage; all the Authorities that I have examined, agree in considering it due to ovation, Those who claim, that it be a secretion, regard it as an abortive attempt to form a decidua membrane, considering it as the product of the tubular glands, There are many insurmountable objections to this explanation, I need only mention the sanguinous appearance of the discharge, the Microscope even detects blood corpuscles in it; this one fact is sufficient to prove the fallacy of the proposition, "That Menstruation is a secretion

Is it a modified hemorrhage, How this would seem to cover all the ground; There

who advocate this doctorine, have been quite fortunate, in the selection of the term of "Modified hemorrhage". I will however call attention to the manner in which they attempt to account for this elimination of blood, They say that on account of the irritation produced by ovation, the uterus being closely connected to the ovaries, there is a greater supply of blood to these parts than their veins can convey back to the general circulation, therefore there is local congestion, and that this congestion forces the blood through the parieties of the blood vessels of the Mucous Membrane into the cavity of the uterus, This I believe is the usual plan of explanation, and I must say, that to me it is not sufficiently satisfactory, In opposition to this doctrine I will offer these remarks; that though

Natural action sometimes makes lesions to effect a physiological process, as in the glands of Peyer and Graphian vesicles. and that here we may account for these lesions, which are due to the anatomy of the parts, both instances that I have mentioned, being caused by the escape of the contents of closed sacks, which contents, having become mature, might by being detained, become a source of irritation; here too we have only the escape of a secretion or excretion. While in Menstruation, according to the above doctrine, we have the exudation of blood, an action similar to that of inflamed mucous membranes; therefore they are forced to regard it, as a pathological action, when undoubtedly it is one of the most conservative processes in the physiology of the human family.

Menstruation is due to ovation, this is fully proved, first by the time, it makes its appearance, and when it ceases, continuing during that portion of woman's life when she is capable of bearing offspring. Secondly by examination. it has been found that at each Menstrual period, an ovule has been thrown off; post Mortems show that the ovaries have as many corpora Lutea, as the subject has Menstruated, and always a fresh one if the subject died during Menstruation, and in some cases of this Kind the ova have been detected in the fallopian tubes,

About the age of puberty, the ovaries increase rapidly in size, and commence their proper function, the secretion or elaboration of ova; Each ovum being

contained in its own proper vessicle; as an ovum becomes mature, which is the case with one or more every four weeks, it makes its approach to the outer wall of the stroma and presses against the serous covering of the ovary; by the enlargement of the ovum, this coat becomes gradually tense, this physiological pressure, acting as a local irritant to the parts, invites to the ovaries a free supply of blood, the uterus being closely connected to the ovaries both by nerves and blood vessels, also becomes stimulated or irritated, (It is an invariable rule, Where there is an irritation, there is an increased flow of blood;) The fallopian tubes responsive to this stimulation, become turgid and with its fimbriated extremity grasp the ovaries, and receive the ova which they assist in disengaging

from this cells and convey them towards the uterus. Now had we have a great exciting iritant, even the rupture of a graafian vesicle, together with an actual lasion in the continuity of the peritoneum, consequently there is an increased flow of blood to the uterus. ovaries and vagina so greatly is the quantity increased, that the parts become congested, owing to the inability of the veins to return the blood to the general circulation as fast as the arteries convey it to them; The uterus being congested, engorged with blood, which should the ova be impregnated, would be needed to supply substance, from which the tubular glands might secrete the deciduary membrane, and assist in the anticipated growth of the uterus itself; But as these glands fail to recieve that stimulation imparted

alone by the united spermatic fluids and ova, which stimulant would have set them into action & operation; they now fail to perform their function, therefore nothing now prevent-ing the exit of blood through the open ex-tremities of the arteries, the blood & body pours through their small orifices, into the cavity of the uterus, to be discharged through the os tincae into the vagina. The parts are thus depleted and soothed by a physiological action, which in fact, is nothing less than an actual hemorrh-age, consisting of arterial blood,