AN INAUGURAL DISSERTATION,
ON
Intra Uterine Life
SUBMITTED TO THE
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BY
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OF
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To

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The able professor of obstetrics

This thesis

is respectfully inscribed
Intra-Uterine Life

Intra-uterine with all its phenomena, with all its operations for the maintenance & development, like many physiological questions yet remain sub judice. Take the whole system of physics, physiology & anatomy &c., I believe I am correct in saying, there is none upon which there is so many differences of opinions, so many antagonistic theories & so many hypotheses advanced. What subject is there which can admit of such beautiful hypothetic reasoning as this?

Immeasurable opinions have been advocated as regards the manner in which the foetus is nourished in utero. And every one has had its advocates, arguments & experiments. To sustain the same, but like man they serve their time & pass
away remembered only in obsolete history. From experience I can speak nothing in regard to my subject. And the only apology I could offer for venturing upon a theme about which there is no stereotyped opinion is that I was allured hither, by its many theories the beautiful reasoning with which each advocate has endeavored to sustain his position, but more particularly, because if there be any one point in physiology from which we can view the beautiful side of nature's mysterious workings, his is in vertebrate gestation.

Where is this beauty, this grandeur and sublimity, connected with intrauterine life? It is to be conceived that from an amniotic cell so small that the naked eye is unable to perceive it, springs into existence an animal the lord of creation.
Here is this done? By what process?

This Permanence is involved in to untranscendental life or yet in Known
& it is more than probable will ever be hid from the Knowledge of man.
All we know is, it is doing it we can
not unmask the mystery, cannot come
and nor explain its metamorphosis.
We know that the giant oak of the
forest is germinated from an acorn
here we are forced to stop, because we
are unable to explain the Transformation.

Mathematics is the only perfect science.
Here hypotheses are advanced, but unlike
in medicine, no there a tangible point
can be arrived at, a fact can be established & demonstrated.

The medical mind must have something
to which it must cling, & for this reason
So many conjectural (I think the word is #) theories are brought forward, how this spermatozoon comes in contact with the female ovum, I will not discuss; but mention the manner by which some Aristotelians account for it.

1st. That the male sperm comes in contact with the female ovum in the cavity of the uterus: 2nd. The spermatozoon (which according to some is the fertilizing part of the sperm) passing the power of locomotion up the Fallopian tubes, where it fixes itself upon an ovum, which becoming fecundated is borne back to the uterus by the same tubes.

3rd. That the semen is absorbed by certain vessels which pour their contents upon the ovum &c. &c.

Let us suppose the fecundated ovum has passed into the uterus leaving before it...
The Caducea (Cazeaux, 1772) forming their
by the Caducea reflexa.

During the earliest days the foetus evidently
is nourished by the distillation of the urine
that
and also, I believe by the Caducea, which con-
tains within its cavity a liquid, which can
perform no other office than that of nour-
ishment. For up to this time the placenta has
not made its appearance, and there is no direct
communication existing between the mother's
embryo, and in further proof of the nourishing
powers of the Caducea is its excretion of an almost
Total abrogation as soon as the placenta is
formed. It certainly performs some other office
than that of nourishment to be returning the foetus
within the uterine cavity, & it must be the
one I have mentioned above.

Amissile.

The next menstruation of the uterus which
does not mention is the Allantois, it makes
its appearance about the tenth day, sprouting.
The inferior part of the intestinal canal.

It takes on a rapid growth, attaching itself to the face of the Chorion, having the terminal capillaries of the umbilical arteries & vein ramifying upon its walls. The inferior part of the Allantois is the Monochorion, which is supposed by some to form the umbilical madder, while others consider it as a suspensory ligament of the bladder. Some anatomists regard the allantois as a receptacle for the fluid contained within.

The allantois certainly serves some greater and more important function than as a receptacle of urine. In proof of this is its vascularity. And that more it contains the ramifications of the umbilical vessels, which subsequently become the umbilical chord.
the vessels of the mother through the wall of the chorion. Its function is one of early nutrition. Does it not in part fulfill the office of the placenta? If not, why is the annihilating them attended by the supervision of the other? If not, for what purpose do the terminal branches of the umbilic vessels which are spread upon the allantois plunge through the wall of the chorion and come in contact with the maternal vessels. Its function will our remaining in doubt on account of its sudden disappearance exit.

The most important of all the organs of the embryo is the placenta. It is the principal connection between the mother and fetus, according to some it circumscribes it performs the same office to the fetus as the lungs do to the adult.
By means of this the embryonic blood is anastomized also time and again at one of the chief means through which the child receives nourishment from the womb, through the umbilical vessels.

It is a soft, springy body, formed by the penetration of the villi of the chorion into the decidua area. It is divisible into two parts, fetal and placental. The former is formed by the umbilical vessels, which diverge in every direction from the point where they enter its surface, or in other words it is generated by the expansion of the vascular tufts of the chorion, forming the terminations of the umbilical arteries and veins. The latter is made up by an enlargement of the decidua villous vessels, these assume the character of sinuses against which the vascular tufts project so as to form not
of it is essential for them (Chatin 362).

The placenta is attached to the uterus by simple approximation, either in or between layers of the decidua being interposed between the two surfaces. There is no adhesion in the nature and condition of the parts by which we may, it must be Caesare by disease we have seen that the decidua is caduceous to a part in the nourishment of the young prior to the formation of the placenta.

What are the functions of the placenta? the deoxygenation & oxidation of the embryonic blood. How is this strange accomplished? by bringing the blood of the mother which is transmitted into the maternal placenta, in close contact with that of the foetus, having only the thin deliquescent walls of

Capillaries in an artery, to be more explicit and assuming the position that there is no direct communication of the maternal to fetal blood; the fetal blood, after having made its transit through the fetal circulation is borne back to the placenta by the umbilical arteries; at this point of entrance they are divided into innumerable branches which come in contact with the maternal vessels containing arterial blood. This arterial blood is forced into the maternal placenta by minute capillaries branches of the uterine or it is absorbed by them from the uterine by osmosis. Then the fetal venous blood coming in contact with this arterial blood by a certain chemical action gives off its 

\[ \text{CO}_2 \] from the mother's blood oxygen. This blood
becoming oxygenized is carried by the venous capillaries to the umbilical vein back to the child. This is the most
opinion in relation to the placenta as an organ of leukodosis.

Yet in view of this almost universal opinion (which I have stated above, which I adopt)
I am forced to admit, that of all the
theories which have been offered for our adop-
tion or rejection, with regard to the oxida-
tion-process of the portal blood that of
direct circulation is the most natural.

I might buy, most plausible. I mean by
direct circulation either a continuation of
the maternal blood to the child or Rou-
chauld's theory, of transmission by absorp-
tion, or that of Hunter, that the maternal
blood was passed into sinusoids and then
depicted of whatever was nourishing to
the child by the portal vessels.
Now is it not possible, age, is it not is unable to suppose that the umbilicus capillaries pierce and ramify through the whole placenta may not take up the maternal blood from uterine veins and these capillaries reciprocate with absorbtions? The injections of Mr. Bonami demonstrated the fact that a fluid injected into the maternal arteries was found in the capillaries arteries of the uterine placenta.

Now if I understand Prof. Watson rightly he said: "The fetal capillaries coming in contact with the uterine arteries absorbed both origin & nourishment from them."

Now if the fetal vessels absorb nourishment, which must be liquid, in the same way can't an analogous to blood? It absorb blood or a fluid which contains both nourishment & blood? Cannot vessels be so small that no injection however nice can be detected? Are there not
Vessels whose caliber is so small that no fluid however thin can enter? Is the blood in the most minute capillaries transmitted by a vis a tergo?

Hunter's theory of foetal circulation is:

"The arteries which are not employed in the nourishment of the organ fetus... make two or three spiral turns upon themselves, pass obliquely through the decidua into the placenta, without any diminution of caliber, and terminate by open mouths in to cells, from these arise arterioles which penetrate vessels, form back to the mother. And while this blood is in these cells or haemorrhoidal, the foetal capillaries deprive it of what ever is necessary for the maintenance of the child."

He holds that the maternal and foetal circulations are distinct. This thesis could be extended into almost infinitude upon the
The functions of the placenta are so complicated and numerous that it is difficult to give an adequate account of them in a brief space. It is, however, of great importance to understand the process by which the fetal blood is oxidized.

I have endeavored to show that the circulation of the umbilical arteries and veins is not independent of the placenta, and that the fetus is dependent upon the placenta for its nourishment. All physicians are unanimous in admitting that the nutrition is derived from the mother, but by what means it reaches the child is still a matter of dispute. Am I not correct when I say that it (nutrition) is borne to the child in one of the following ways? By direct circulation; by Hunter's mode; by being converted and absorbed by the villi of the chorion and transmitted to the amniotic cavity.
and then absorbed by the forms, only

being secreted in the form of a fluid and
blood

gases to be absorbed by the umbilical capillaries.

All these different modes have their advanta-

ges. Cazeneuve, in part, enters the

field in favor of the amniotic waters

having the power of nutrition, “thus far at least”

he says, “that the Choridal Villi (among which

the placenta is formed) are not all concerned in

forming the radicles of the umbilical vessels, but

that a certain number still retain their

primparine functions continue to absorb

the fluid secreted by the internal walls

of the uterus, which fluid reaches the amni-

tic Cavity by Transudating through the am-

nios.” In proof of this fact is also that extran-

eous substances do not first enter the fetal

circulation through the Placenta, but that

it first penetrates to the waters; the case

of A. A. is in support of a pregnant woman
who was poisoned by sulphuric acid, which was dissolved in the amniotic waters. Now if this be the true thing, that the nourishment is poured into the amniotic cavity, the question arises how does it get in to the circulation? It must be by absorption through some polyedrists teach that it is swallowed and digested. This seems both unreasonable and unlikely of the case. What becomes of the effete matter? It is not certainly the amniotic fluid, for this is a mixture of the intestinal and other bile.

If this nutrient matter which is, according to Cazaux and others, poured into the waters it is taken into the circulation only by cutaneous absorption. Does the skin absorb it? Of course it does. Thirst has often been quenched by plunging the body into water. Physiologists, excuse it, purging can be produced by cutaneous absorption.
Let us examine for a moment Cazeneux's theory. He says: "all the villi of the chorion (among which the placenta is formed) are not concerned in the formation of the umbilical radicles, but that a certain number will retain their primitive form and continue to absorb the fluid secreted by the internal walls of the villi. We, and are, proud to admit if there will do exist in their primitive function after the formation of the placenta is formed. Cazeneux must be right in part. He evidently contradicts himself at Page 134 & 15; he says: The chorion is developed in a great measure by the kochia & thence comes in contact with the vitelline walls at a very disturbed point.***

***These villi are becoming interlaced & mixed with the umbilical vessels contributing to the formation of the placenta.***
After the development of the Placenta, the Chorion becomes a thin, transparent, Colorless membrane, uniting outwardly to the Caduceus by short delicate filament the remains of the atrophied villi. It becomes to me a plain contradiction. If a portion of the Choroidal villi entered in the formation of the Placenta, with the umbilical vessels ramifying & piercing the map, it is no longer apart of the Chorion but of the Placenta. At one time the Chorion is vascular, after the Placenta is formed it becomes atrophied be.

I cannot coincide with Coueaux. The amniotic watery must alone perform the function of protection to the Child from extramural violence & by sustaining equal Inverse force.

I am forced to endorse Briggs & Deluyes who deny direct circulation & Coueaux’s theory & teach that the ‘division of the
is dependent upon a fluid more or less analogous to blood, which is elaborated by the placenta from blood absorbed from the womb, & this sapubum is taken up by the umbilical vessels & transmitted to the child."

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