

The
 Evidences of Pregnancy,
 obtained by
 the
 Microscope
 and the
 Stethoscope..

James. Hutchinson
 March 1850.

Almap has prevented my doing that justice to this Thesis, which I should have wished. It is far from being completed, and altogether does not quite merit the title which I have given to it.

The Auscultatory evidences of pregnancy have not been touched upon, and the Microscopic have been hurriedly & imperfectly discussed.

Some of the signs of pregnancy, more commonly stated in works, and which I had intended to have introduced, have not been noticed.

James W. Hutchinson.

Among the many interesting questions which almost daily present themselves to the Medical Practitioner for solution, none merit his attention so much, or are of such importance as that which relates to the existence of pregnancy.

Before entering, therefore, into the more immediate subject we have pointed out for ourselves, we shall give a few examples collected from obstetric records of the vast importance of being able under all circumstances to pronounce upon the existence, or non-existence of pregnancy.

We may consider the importance of the question under several different heads and.

First. In regard to the Mother.

The life of the Mother has been frequently endangered, and as frequently sacrificed by a faulty diagnosis of her condition - one illustration, from many that might be adduced, will suffice.

* Dieffenbach of Berlin performed the caesarean operation on a woman, supposed to be pregnant, and who laboured under so great a deformity, as to preclude the possibility of the natural delivery of a child

*. London Medical Gazette for 1828.

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many of the first obstetricians of Berlin were present, some of whom had examined and declared the woman to be pregnant, and, yet, the result of the operation showed, that neither foetus, tumour, or enlargement of any viscus, existed.

Secondly, it has as frequently happened, & from the same cause that the life of the foetus contained in utero of a woman condemned to death, has been extinguished along with that of its guilty parent. * Mauriceau records a case which I shall give in his own words.

"We saw at Paris in the year 1666, a miserable example of this kind in a woman who was hanged and afterwards dissected publicly.

"She was found to be pregnant with a child of four months, notwithstanding the report of the persons who had visited her by order of the judge before her execution, who assured the judge that she was not so.

What deceived them was that the woman had menstruated in some degree. This affair made much noise at Paris, that it came to the knowledge of the King and all his court, by whom those persons were greatly blamed, who by their

* Mauriceau. Sur les Maladies des Grandes Femmes
1721. Tom 1. liv 1. p. p. 71. 72.

"ignorance had been the cause of the rash
 "execution of this poor unfortunate, with whom had
 "perished her infant, which was innocent of the
 "crimes of its mother".

* In another case which happened at Norwich
 in 1833 the life of the foetus would have been
 sacrificed with that of its mother, if it had not
 been for the timely & judicious interference of the
 surgeons of that city.

A woman, named Mary Wright was clearly
 proved guilty of poisoning her husband, and was
 condemned to death; but she pleaded pregnancy
 in bar of execution; a jury of matrons was
 appointed to ascertain her state, and they declared
 that the woman was not quick with child, the
 judge therefore ordered the sentence to be enforced.

The surgeons of the place, however, fully alive
 to the absurd method adopted to ascertain an
 extremely difficult point of diagnosis, and one
 involving the life of an individual in its
 accuracy, voluntarily waited upon the convict in
 the jail on the morning following, & satisfied
 themselves that she was not only pregnant, but

*. Medical Gazette. April 1833.

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quick with child. they, therefore immediately forwarded to the judge of assize their opinion, which was respected, and the execution was ordered to be delayed till the delivery of the woman which was safely accomplished some time after.

Thirdly. the importance of our subject cannot be better illustrated perhaps, than by stating that the reputation of the female, which to some minds is dearer than life itself, may have a permanent cloud cast over it, by an inaccurate & incautious ~~opinion~~ statement, on the part of the Medical Attendant. For, how often have

Menorrhagia & enlargement of the abdomen proceeding from obstructed menstruation, tympantia, diseased ovary, or the presence of moles or hydatids led to unjust suspicions regarding the purity and chastity of the female -

Dr Kennedy, of Dublin justly remarks that the character of an innocent female has been often sacrificed by ignorance, or the imperfection of science.

Fourthly. The diagnosis of pregnancy comes to be a

matter of great importance, when it concerns the security or loss of property.

For cases, sufficiently numerous are recorded where the claim to property has been disputed from the following circumstances. The husband dies, shortly after marriage, leaving no children & bequeaths his property to his nearest relative, but the widow declares herself to be pregnant & lays in a claim to the property for her yet unborn child - the opposite party are therefore anxious to know whether her statements are correct, and for that purpose appoint well qualified persons to ascertain her condition. These cases have sometimes resulted in the overlooking & non-recognition of pregnancy when it really existed, in the detection of fraud when practiced, or in ascertaining the true existence of pregnancy, and thus obtaining a just decision of the case in favour of the widow.

A case in illustration of the last is given in the Medical Gazette for August 1835.

Mr Fox of Northampton died in May 1835 leaving a widow to whom he had not been married much above six weeks. His will executed in the preceding January decreed that his property should go to the use of his friend Ann Bakewell, and after

her decease to John Marston. Now Ann Bakewell soon after became the wife, and is the present widow of Mr Fox. On his decease she announced herself to be with child and entered a caveat against the presumptive legatee Mr Marston; whereupon the latter immediately applied for a writ "de ventre inspiciendo". Her statement of her condition was confirmed by those appointed to examine her, and subsequently by her giving birth to a child. The case was therefore decided in her favor.

Dr. Montgomery in his work on the "Signs of Pregnancy" relates a similar case, but where fraud was practiced by the widow. "The lady had been about four months married to an elderly, and, as it was ascertained, an impotent man, when he died, having before his marriage, made an arrangement of his affairs in favour of his son by a former wife: on his death the son proposed to take possession of the property at once, to which the widow objected, saying that she was pregnant, and had a claim in right of her child. It was agreed between the parties that the existence of pregnancy should be determined by

reference to medical men chosen on each side,
 " but before anything further was done the
 " lady contrived to effect the sale of the greater
 " part of the property, and, appropriating the
 " proceeds to her own use, disappeared, leaving
 " the parties concerned to settle the matter as
 " they best might. The event proved that
 " she was not pregnant "

Fifthly, an accurate knowledge of the signs of pregnancy is sometimes necessary for the detection & exposure of imposture.

* The case of the aged virgin prophetess Johanna Southcott is well known since it occurred in comparatively recent times viz in 1814.

She astonished alike her town and nation by declaring herself to be pregnant, and that by supernatural means, her case therefore excited an extraordinary degree of attention, and many medical men were consulted about her.

She was 64 years of age, and had ceased to menstruate for 15 years - her bosom &

* Gooch's Diseases peculiar to women.
 p. 231.

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Belly were much enlarged, and she stated that she had felt the motions of the child ever since the month of May. The state of the cervix & os uteri were not ascertained, for she would not submit to an examination per vaginam. stating as her reason, that "her warming spirit had desired her not to submit to it". But notwithstanding the enlargement of the breasts and abdomen was so evident, and the apparent motions of a child so perceptible that both Drs. Reese & Adams declared her to be pregnant.

However it was soon apparent that her death, and no other labour approached - the swelling began to diminish, and before the close of the scene had considerably diminished - and on examination of the body which was only permitted after it had lain four days in the vain hope of its resuscitating - the womb was found smaller than natural & was free from disease, and in its interior no fetus existed. - "The abdominal parietes contained four inches thick of fat, the intestines were distended with air, and the omentum which was nearly four times its

usual size appeared one lump of fat". but there was no trace of the tumour which had been felt during life, and which is supposed to have been produced by the aged virgin having learned to retain the urine until the bladder became considerably distended, and to imitate the foetal movements by a jerking movement of the abdominal muscles.

* Smellie mentions a case where deception was practiced in order to procure money. I shall give it in his own words.
 "Some years ago I was solicited by the
 "midwife of Mary Le Bow workhouse to go
 "thither and see a girl about 12 years of
 "age, supposed to be 8 months gone with
 "child. She told me that several gentlemen
 "had examined her, that one of them had
 "offered to deliver her gratis, and some others
 "had made great interest to be present at
 "the occasion. I accompanied the midwife
 "and first examined the external parts, when
 "finding the passage so small, that I could
 "not introduce the tip of my little finger

* Smellie. vol II. p. 220. 1766.

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"I made no hesitation in declaring, that she
" had never conversed with man. I found
" a large swelling behind the Scrobiculus
" cordis and the navel which appeared to be
" the liver very much enlarged. The uterus
" it could not be, for I pushed my fingers
" quite below it and pressed in the
" abdominal parietes almost to the vertebrae
" of the loins. The girl had been advertised &
" the matron had got money from numbers
" who went to see her, and notwithstanding
" my declaration, the farce was carried on,
" until people began to suspect the deceit,
" when she was sent to one of the hospitals for
" the cure of her hepatic disorder".

Sixthly. The only other circumstance we shall
notice which renders the diagnosis of pregnancy
a matter of considerable importance is in relation
to the treatment of cases of Pseudo Pregnancy and
complicated Pregnancy. In cases sometimes
occur where the morbid condition which
simulates pregnancy is of an extremely urgent
nature; and yet were it is possible that
the disease might unknowingly allowed to

extend its ravages, from the general similitude of the symptoms to those of pregnancy & labour. A most instructive case in illustration of this point happened in the year 1844 in the practice of M. Barbieri of Fife - it was a case of Intestitis which strongly simulated Pregnancy & Labour at the full time - the symptoms of the disease were those commonly referred to pregnancy & labour, and at one time bore so great a similarity that the Surgeon was nearly persuaded that the case was one of true labour - he however formed a different opinion from noticing the absence of the characteristic glandular follicles at the base of the nipple. Taking this in connection with the urgency of the general symptoms, he put in practice a heroic treatment, which the subsequent history of the case proved was demanded. The patient sank, however, under the violence of the disease.

Again, when cases of ascites, obstructed menstruation or typhoiditis simulate pregnancy, it is important to ascertain whether the symptoms are not due to pregnancy

so that the treatment adopted in each particular case may be followed out.

But while we are aware that these diseased states may simulate pregnancy, so as to be mistaken for it, we should also know that pregnancy may be mistaken for them. There is a case reported by Sir. Astley, Cooper where the pregnant abdomen was attempted to be tapped by an ignorant practitioner. and Dr. Gosch mentions that "a woman was taken into the operation room of a well known hospital for the purpose of being tapped for supposed dropsy of the ovary, but the surgeon, on learning that she had not been examined, sent her back to her ward: this caution", adds Dr Gosch, "was fortunate, for before the next operation day she brought forth a child."

II. Under this, the second division of our subject we intend to speak shortly of the difficulties which often attend the accurate diagnosis of pregnancy. These difficulties arise from numerous sources which may best be classed under the following heads.

1. When the existence of pregnancy is masked by the presence of disease termed by Dr. Kennedy complicated pregnancy.

2. When other morbid conditions simulate the presence of pregnancy, termed by the same author. Pseudo Pregnancy.

And 1st of the difficulties which attend the diagnosis of pregnancy when complicated with disease

The first disease we shall notice which sometimes complicates pregnancy, and renders its recognition a matter of some difficulty is Ascites -

One of the chief difficulties that may arise or proceeds from the Practitioner placing the existence of pregnancy out of the question, not supposing it possible that a woman labouring under ascites could become pregnant; however, this disease, though it depends on an organic lesion does not at all prevent the possibility

of the occurrence of pregnancy; for females have been known while labouring under this disease to have borne many children.

The general abdominal distension concealing the enlarged uterus also adds to the difficulty.

* Dr Montgomery mentions a case where pregnancy complicated with ascites, owing to this cause, remained a matter of the utmost doubt until the seventh month.

The dangers which may arise from this complication proceed from treating the dropsy, while the existence of pregnancy is never recognized: therefore, it is laid down as a general rule, by the best authorities, that "whenever a woman is so circumstanced that she may possibly be pregnant, she should not on any account be tapped for dropsy, or subject to very active treatment, until a full & accurate examination of her state has been made by competent hands".

2. Dropsy of the uterus. a condition produced by an overabundant secretion of the liquor amnii.

* Dr Montgomery's Signs of Pregnancy.
p. 177.

which collects between the membranes, sometimes renders the existence of pregnancy a matter of considerable doubt; when it exists in large quantities it may give the appearance of ascites, but more frequently it is confounded with ovarian dropsy.

3. Uterine hydroids & moles. Sometimes complicates pregnancy, & more frequently those case where the ovum has been obliterated. To ascertain their presence is an extremely difficult point of diagnosis, and no precise rules for the purpose are laid down.

4. Another class of cases liable to complicate & mask the existence of pregnancy are tumours of the ovary: it must be remembered that the presence of these tumours does not prevent the occurrence of pregnancy.

Dr Montgomery mentions a case, where a "lady with ovarian enlargement on both sides, and of considerable size became pregnant and her true condition was not recognized until pregnancy was very far advanced."

The difficulty in the diagnosis of pregnancy with this complication is chiefly in the early

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months. * Dr Kennedy gives an interesting instance of this complication, and the difficulty which sometimes attends its diagnosis.

I shall give it in his own words.

"Dona Mc'Keon - aetat 38, married for 6 years,
"has had no child, but about four years ago
"miscarried at the 4th month - called on the
"5th of January to consult me about a tumour
"in her right iliac region, which altho' not
"painful caused her considerable uneasiness
"from its situation -

"It first appeared about the beginning of October
"preceding, since which time it has been gradually
"increasing in size: her menses ceased about
"the time she first observed it - On examining
"her abdomen, a tumour was distinctly perceptible
"in the right iliac region, hard & uneven,
"about the size of a goose egg, and very
"moveable; there was a fulcup to the left
"of this, which appeared somewhat like the
"distended uterus, and which was quite
"unconnected with the tumour in the right side.
"On questioning her as to the possibility of her

* Dr Kennedy's Evidences of Pregnancy.
p. 146.

"being pregnant, she seemed never even to have
 "suspected it, or to have had any of the signs usually
 "attending this state, farther than the cessation of
 "the menses, which she very naturally concluded,
 "might have been connected with the tumour
 "in the right side, never having herself observed
 "the fullness in the left which was general, and,
 "therefore more likely to escape her notice.
 "She states that she is and has been in constant
 "intercourse with her husband ever since her
 "marriage. As the case appeared one
 "involved in considerable mystery, I begged
 "my friend Dr Collins to see the patient with me
 "which he did; and after patient examination
 "of the tumour, exploring the os uteri, and
 "learning the history of the symptoms, as
 "above related, the conclusion we both
 "arrived at was, that with the ordinary
 "means of diagnosis, no person could say
 "with certainty whether she was, or was not
 "pregnant, altho' it ~~might~~ ^{might} be conjectured
 "that such was the case".

5. A tympanic distension of the abdomen
 sometimes accompanies and obscures the

pregnant state, and while this distension, which is sometimes enormous is present, all abdominal examination with a view of detecting the uterus is useless, particularly in the early months of pregnancy. The tympanitic distension should be first removed by the exhibition of warm purgative medicines, & then the diagnosis becomes more easy.

Dr Kennedy narrates a case where a lady requested his attendance as her approaching confinement in Nov 1829. Her medical attendant who had recently treated her for peritonitis having told her that she was near her full time. She herself states that she quickened 6 months ago, and had since then felt the motions of the child frequently. However on the application of the stethoscope, neither foetal circulation, nor the placental souffle could be detected; and on making a vaginal examination the neck of the uterus was found elongated, and very little enlarged.

Dr Kennedy therefore gave it as his opinion that she could not be more than two months pregnant, if so much; and which

was subsequently confirmed).

6. Tumours, especially of the hard, fibrous kind, which are so common to the uterus, occurring either on the surface, or imbedded in the substance of that organ; may be expected sometimes to complicate pregnancy: But it is only when they attain to a large size, that difficulty is felt in the diagnosis. "When such tumours acquire great bulk, and pregnancy occurs, they give rise to a combination which imposes extraordinary difficulties in the way of forming a correct diagnosis." The difficulty in these cases arises from the distended state of the ~~uterus~~ abdomen, & the extreme tension of its parietes, rendering it often impossible to recognize, externally, the exact form or condition of any of the contained organs, and the obstruction of the pelvic cavity may be such as greatly to impede, or even altogether prevent, the possibility of making an ordinary examination per vaginam.

Dr Montgomery records a most interesting, & instructive case where pregnancy was

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complicated with an immense fibrous tumour of the uterus. but the existence of which state was rendered almost incredible by the following circumstances.

1st Several years of married life without conception.

2nd A preexisting morbid tumour in the abdomen, which, even at the time of marriage, was of such size as to render the consummation of that rite nearly impossible.

3rd The continued growth of the tumour, which, long before the occurrence of impregnation, so filled the cavity of the pelvis as to impede strongly the introduction of the common catheter into the bladder.

4th The impossibility of making an examination per vaginam.

Having now noticed the difficulty that may attend the diagnosis of pregnancy when complicated masked by other diseases, we may speak shortly of the 2nd Head, viz Pseudo Pregnancy, or pregnancy simulated by certain morbid conditions, either

corporeal or mental.

The first we shall notice is in connection with the function of menstruation.

Menstruation when suppressed, or prevented from returning as usual after it has been established is a morbid state which has been frequently mistaken for pregnancy; for whether dependant on other diseases, or on the state of the uterus itself, it excites those morbid sympathetic changes in the other organs of the body which are analogous to those produced in the course of pregnancy.

This will be evident by shortly stating the symptoms which have been noted to be consequent on retained menses; these are an altered expression of the countenance, dark ring under the eyes, sickness of stomach, sense of fulness & weight in the pelvis, slow state of the bowels, and often pain and distension of the breasts, with darkened areola & tumid abdomen.

These symptoms are very analogous to those noticed in pregnancy, and may therefore mislead in the diagnosis.

Smellie says "The difficulty of distinguishing

"Between obstructed menstruation & pregnancy
 "in the first months is so great, that we
 "ought to be cautious in giving our opinion;
 "and never prescribe such remedies as may
 "endanger the fruit of the womb, but rather
 "endeavour to palliate the complaints until
 "time shall discover the nature of the case:
 "and always judge on the charitable side,
 "when life or reputation is at stake."

In some cases of suppressed menses, not
 only pregnancy, but actual labour has
 been pronounced to be present. In
 illustration of this, there is an interesting
 case by Dr Kennedy. — An unmarried girl
 aged 18 was sent to the Lying-in Hospital
 by the direction of an eminent surgeon by
 whom she was pronounced pregnant, and
 in active labour. — Her vociferations in
 the ward attracted attention, and on
 examining her, the abdomen was found
 distended and tense, but no part of the
 child could be distinguished through
 the abdominal parietes. — And on
 applying the stethoscope none of the
 characteristic sounds of pregnancy could

be heard. — When the abdominal muscles relaxed from the state of spasmodic contraction into which they were thrown, the spine could be distinctly felt, and with no uterine tumour intervening — She was freely purged, and in consequence there was brought on a copious menstrual discharge, and all the signs of pregnancy quickly vanished.

In another case, the details of which are almost identical with the one just related, the girl's chastity was much questioned, and there was considerable difficulty in even persuading her mother that she was not in labour when this pain & spasm set in.

Dr Gooch gives two examples where pregnancy was suspected by the parents of two young ladies, but with reason, their state however was due to suppression of the menses.

Pseudo pregnancy is by no means infrequently caused by the cessation of the menses at the period of life when they naturally stop altogether, and the symptoms so much resemble those of

pregnancy, that the woman feels convinced that she is pregnant; "An idea" says Dr. Montgomery, "which, at the time of life alluded to is cherished by the sex with extraordinary devotion, and relinquished with proportionate reluctance."

That the diagnosis of these cases is sometimes difficult, and requires caution will appear from the following case quoted from Dr. Montgomery.

"Several years ago, after seeing within a short time some cases of spurious pregnancy, I was consulted by a lady, whom I knew to be past forty, and whose youngest child was then between 7 & 8 years old. She stated that the catamenia, which had been for some time gradually diminishing, had disappeared altogether for the preceding three months, that in every other respect her health was as good as usual, but that some of her friends had been joking her about her being in the family way: the idea I discouraged as improbable, and suggested as delicately as I could that her age would account sufficiently for the circumstances which attracted her attention, and I ordered merely some gentle

"aperients which she required. Two months
 "afterwards she sent for me, and to my
 "surprise and consternation, informed me
 "that she had quickened, and would require
 "my attendance at such a time; adding, that
 "she hoped I was now satisfied, that she was
 "not quite too old to add to her family - It
 "was all true; in due time she gave birth
 "to a son".

2. The next variety of Pseudo pregnancy I shall notice is that which is termed nervous pregnancy, a state depending upon the mind or imagination of the individual herself - It does not present so much difficulty in the way of diagnosis, as in the difficulty experienced in overcoming the morbid belief of the patient. and it is remarkable how long the female may retain the ~~morbid belief~~ impression that she is pregnant. Dr Montgomery states that he was consulted in a case in which the foetus was supposed to be extra-uterine, and its motions to have been constantly felt both by the patient and her medical attendant for nine

years.

3. Pregnancy may be simulated by the female for various sinister ends, as for the purpose of extortion, retaining estranged affections, or for protracting the period of execution. here then a great deal of responsibility necessarily involved, and the difficulties in the way of ascertaining the truth are all thrown up to the female. She, as Harvey expresses it, has obtained "an accurate knowledge of the breeding symptoms and describes fully all the ordinary & well known signs of pregnancy. When a vaginal examination is proposed, it is either refused, or is reluctantly assented to, while the limbs are kept stretched out & pressed together, by which the parts are so narrowed as to be almost impervious — And if an abdominal examination is tempted, the breath is held in, and the diaphragm forced down, at the same time that the abdominal muscles are brought into action, thus rendering any attempts to arrive at the state of the parts in the abdominal cavity,

quite unavailing.

4 Diseased states of the ovary, especially dropsy of that organ, are occasionally mistaken for pregnancy; and pregnancy on the other hand has been mistaken for dropsy of the ovary.

Dr. Good says, "A woman was taken into the operation room of a well known hospital for the purpose of being tapped. But the surgeon on hearing that she had not been examined sent her back to her ward; the caution was fortunate for before the next operation day she brought forth a child."

Solid tumours of the ovary have likewise been mistaken for pregnancy and a case is recorded in the Journal de Med. et de Chirurgie for 1841. where scirrhus of the ovary was believed to be a pregnant uterus.

"A woman believed she had reached the full time; but the surgeons who were called in, discovered that the product of conception was not contained in the womb. Nevertheless she was suffering severe pain

" attended by efforts of expulsion. Several ac-
 " coucheurs assembled in consultation discussed
 " the propriety of practising the caesarean
 " section, but the proposition ~~was~~ ^{being} negatived,
 " the patient was left to repose.
 " Speedily all the appearances of labour
 " disappeared: the efforts of expulsion ceased,
 " and the patient resumed her ordinary
 " occupation. Some months afterwards
 " she entered the clinical hospital in a
 " state of profound marasmus, and soon
 " afterwards died. On dissection it was
 " found that she was not eniente, but
 " that scirrhus of the ovary filled part of
 " the belly " -

5. The developement of morbid growths within
 the cavity of the uterus very frequently produce
 a condition very similar in its characters
 to the pregnant state; and therefore considerable
 attention is required to distinguish them from it.
 The principal of these are moles, hydatids &
 hydrometra.

The uterus, especially when moles fill its
 cavity, attains the size of the pregnant

organ at the full time, in the course of two or three months; which is one of the most important distinguishing features of it. At the end of 3 or 4 months, the uterus generally goes into action to expel them - and their expulsion is generally attended with haemorrhage, which may cause this morbid state to be mistaken for abortion.

"The character of the most correct and exemplary females has occasionally been aspersed and slandered, from moles being mistaken for abortion, an error that has arisen as well from the symptoms attending their growth, as those attending their discharge".

6. It appears from the following interesting case, by M. Barbieri, in the Edinburgh, Monthly Journal for March 1844. that violent & fatal diseases may exhibit in their progress, symptoms not only to mislead the patient, but even to throw doubts over the Practitioner's mind, as to whether pregnancy exists, or not -

M. Barbieri was summoned by a hurried

page to attend Mrs M - W - aetat 32,
in her fourth accouchement. He found
the following symptoms. viz. Severe and
repeated uterine pains, recurring every
five minutes. the catamena had been
absent for 9 months, and 2 days -

According to her statement she quickened
at the end of 4½ months - and had
experienced morning sickness, vomiting,
Dysuria &c.

Her abdomen was the size of that of a woman
at the full time, no pain was felt on
Inspection - the breasts were distended
with milk, and the areola was strongly
marked. She stated that the liquor
amni had been discharged half an hour
before his arrival -

Altho' these symptoms, all pointed plainly
to pregnancy. yet the glandular follicles at
the base of the nipple were ~~to~~ absent. this
mark so dissatisfied him, that he gave
it as his opinion that the lady was not
pregnant, at which she was very
indignant -

At this time he was called away by

another engagement, and on returning in the course of two hours he found her labouring under powerful expulsive pains, which nearly led him to alter his opinion.

On making a vaginal examination he found the uterus in an unimpregnated state. His doubts were now removed - and taking into consideration the violence of the symptoms, he placed her under active antiphlogistic treatment, notwithstanding which the patient sank; the result showed it to be a case of extensive enteritis.

This most instructive instance of the stimulation of pregnancy by so violent and fatal a disease is highly interesting, in as much as it proves the necessity of a thorough acquaintance with all the means used for recognizing pregnancy and also the affections which often attend its diagnosis.

III. We now come to treat of the signs or evidences of Pregnancy.

While, within a comparatively short time, there has been an evident development in our means of diagnosing morbid conditions generally; there have also been great facilities laid open by recent discoveries for ascertaining the presence of the important state of Pregnancy. Still, however, there is a great field for further research.

Numerous signs are usually treated of in all our systematic works on Midwifery; many of them, however, are by no means certain, others, in many cases are inapplicable, & therefore of no value, while only a small number are unequivocal.

We shall follow Dr Montsomer's division of the evidences of Pregnancy, into the Presumptive, Probable, & Unequivocal, as being most simple & practical, and at the same time enabling us to classify them according to their respective value.

And First. Of the Presumptive Evidences of Pregnancy. these are all uncertain, for the same phenomena may be produced by a variety

of derangements of the uterine functions.—

In the ordinary cases of pregnancy, however, they are of great value in ascertaining the stage of pregnancy, the ~~ordinary~~ probable date of labour &c. &c.

1. Suppression of the menses.

It may be stated, as a general rule, that there is a suppression of the menstrual flow during the pregnant state; this has led obstetricians to reckon the duration of pregnancy, and the probable date of its termination from the last appearance of the catamenia.. Taken in connection with

other symptoms, it is, therefore, a valuable diagnostic sign of pregnancy; altho' by itself it is very liable to fallacy; for it is well known that many other causes, independent of pregnancy, produce suppression of the catamenia, both in the married, and unmarried woman; such as, exposure to cold & damp, at the time, they are about to appear, certain chronic affections, as Phthisis pulmonalis, Scirrhus, or other visceral obstructions, the operation of certain powerfully depressing papers

or emotions of the mind; or some imperfections in either the ovaries, or uterus itself.

Another circumstance, which leads to further distrust of this sign, is that cases are authenticated where conception occurred before the menstrual flow had even appeared, and on the other hand, cases occasionally occur in which women have conceived after menstruation had apparently ceased.

Further, ample experience has shown that suppressed catamenia are by no means a necessary consequence of pregnancy.

Blindell remarks that the cessation of the catamenia does not invariably occur when a woman is pregnant, for he has known women, in whom, during the first 3, or 4 months, the catamenia have continued to flow, though in not so large a quantity, nor so long as if they were not pregnant.

Devees has known women to menstruate up to the seventh month of their pregnancy.

Mauriceau says "I have known ^a woman who had 4 or 5 living children, and who had with every child her menses from

month to month, as at other times, only in less quantity, and was so till the 6th month.

Other authors, for instance Kennedy & Burns, while they acknowledge that a discharge reputed menstruous does occur during pregnancy, are inclined to believe that it is not a true menstruous discharge.

D^r Hamilton & D^r Dewees hold that a suppression of the menses is one of the never failing consequences of conception, and the latter argues, that if menstruation had continued in pregnancy, it is scarcely possible, but that abortion must often have followed, as a part of the ovum would necessarily have been detached from the uterus at every period.

To this argument D^r Dewees very justly replies "that for the first two or three months the inferior portion of the uterus, and more especially the neck, are not always occupied by the decidua, but left free and as unencumbered as before impregnation, and it is from this unoccupied portion that the menstruous discharge takes place."

Again, some anomalous cases do

occur and are recorded, where the ordinary law in regard to menstruation is wholly reversed, viz where the menses appear only during pregnancy — cases of this nature have been described by Baudelocque, Daventer & Perfect — but by far the most interesting is that given by Dr Dewees.

"A woman applied for advice for a long standing suppression of the menses; indeed she never had menstruated but twice.

"She had been married a number of months and complained of a good deal of derangement of stomach, &c. We prescribed some Rhubarb & Steel pills; about six months after this she called to say that the medicine had brought down her courses, but that she was more unwell than before.

"The sickness & vomiting had increased, besides swelling very much in her belly; we saw this pretty much distended and immediately examined it, as we suspected dropsy; but from the feel of the abdomen, and the want of fluctuation & solidity of the tumour, we began to think it might be pregnancy, and told the woman our

"opinion. On mentioning our impression she
 "submitted to an examination per vaginam;
 "this proved her to be six months advanced
 "in pregnancy. After this she had the
 "regular returns of the catamenial period,
 "until the full time had expired; during
 "lactation she was free from the discharge.
 "She was a nurse for more than twelve
 "months; she weaned her child, and
 "shortly after was again surprised by an
 "eruption of the menses, which as on a
 "former occasion proved to be a sign of
 "pregnancy". *

It is, therefore, obvious that altho' amen-
 orrhoea is in general a very valuable
 indication of pregnancy; yet without
 pregnancy amenorrhoea may occur; and
 the catamens may continue to flow through
 gestation is certain.

2. The Areola.

It is extremely difficult, amidst the many
 conflicting statements that have been put

* Dewees' Compendious System of Midwifery.
 p. 237.

forth as to the importance of the areola as a sign of pregnancy, to arrive at a just conclusion as to its value.

Some holding that it is an indication not to be trusted to, others, that it never fails. Of the former, Denman is of opinion that the areola is found in many of the complaints which resemble pregnancy, and generally, though not universally, in pregnant women. Dewees says, that the presence of the areola is equivocal in any but a first pregnancy, and even then is not always present, and may not be easily detected even when formed in very dark skinned women. — Gooch speaks much to the same effect.

Blundell holds that the areola as a sign of pregnancy is only of value when it is present in the greatest development, and in a woman who has had a large family before, even tho' the areola be changed in the fullest manner, no certain reliance can be placed on the sign.

Among the latter, may be mentioned Smellie, William Hunter, & Hamilton, who

all regarded the areole as the result of pregnancy alone. However, Hamilton, in one case trusting mainly to the areolar sign as undoubted indication of pregnancy, pronounced a lady to be pregnant, when the uterus was only enlarged by a mass of fibrous tumours.

It is right, however, to add that by means of the areola, William Hunter decided upon a case of pregnancy under very extraordinary circumstances: the body of a young female was brought into the dissecting room, which at the first glance he pronounced to be pregnant, but the accuracy of his diagnosis was not a little doubted when it was ascertained that a

perfect hymen was present; to decide the point he had the abdomen opened, when the uterus was found to contain a small foetus.

This contrariety of opinion expressed by the best authorities in their writings arises according to Dr Montgomery from the circumstance of those who do not value the areolar sign attending to only one of its characters, viz the colour, which, in his opinion, is most liable to uncertainty. He has seen several well marked instances of this, one in

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a lady of very fair skin, blue eyes + light hair; the other in a lady of fair skin, but with black hair, and very dark brown eyes. in both, the colour of the areola was so slight, as hardly to differ from that of the surrounding skin.

The characteristics of the areola are well described by Proedener. he says during the pregnant state "the nipple becomes more bulky and appears inflated, its colour becomes darker; the surrounding disc undergoes a similar change, increases in extent, and is covered with little prominences like so many diminutive nipples".

To this accurate description is added by Dr Montgomery another circumstance. viz "a soft and moist state of the integument, which appears raised and in a state of turgescence, giving one the idea that if touched by the point of the finger it would become emphysematous. This state appears however to be caused by infiltration of the subjacent cellular tissue, which, together with its altered colour, gives us the idea of a part in which a greater degree of vital

"action is going forward than is in operation
 "round it, and we not infrequently find that
 "the little glandular follicles or tubercles are
 "bedewed with a secretion sufficient to damp
 " & colour the woman's inner deep"

The projecting glandular follicles are a sign
 of pregnancy much relied on by some.

We, before gave an interesting case of
 Entertis which closely simulated preg-
 -nancy & labour, & where Dr. Barbieri
 decided on its non-existence from the absence
 of the glandular follicles. However notwith-
 -standing statements like this, and others
 which might be adduced, other observers
 have brought forward sufficient evidence to
 prove that ~~many~~ even these accom-
 -paniments to the colour, are not to be
 trusted to.

Dr Peddie states that he has seen women
 with fair compleactions who had large
 breasts, well marked areolae, numerous
 & large follicular glands, and prominent
 nipples suffering merely from suppression
 of the catamenia. And on the other hand
 he has observed not a few, with dark or

pallid complexion, who, altho' undoubtedly pregnant, had small breasts, small nipples, areolae scarcely distinguishable from the surrounding skin & few or no sebaceous glands.

Dr Simpson in December 1847 showed to the Obstetric Society of Edinburgh a woman in her 7th month, and to show it would have been impossible to diagnose pregnancy from the appearance of the breasts. There was no appearance of a single enlarged gland on the areola, which was not at all tumid, and scarcely darker than the surrounding skin. He at the same time showed a drawing of the breast of a lady who had never been pregnant, but who was suffering from great uterine irritation - the areola was turgid and of a dark brown colour, the papillae numerous and much enlarged and the superficial veins very large and prominent.

9. Movements of the Foetus.

This sign, if it is of any value at all, can only come into requisition at a comparatively late date in pregnancy, viz, in the middle and latter months—

Dr Goech says, that if the hand is laid on the naked abdomen between the pubes and umbilicus, the foetus will sometimes be felt to stir; and he further states that the application of the hand dipped in cold water will ~~effect~~ cause the motion more readily.

But this is needless if others like himself have the "cold hand of a dyspeptic sufferer."

But, as Dr Simpson justly remarks, the mere application of cold to the abdomen will not cause foetal movements, it is only when the shape of the uterus is altered by pressure, that the foetus to take up a new position better adapted to its comfort, will execute certain preservative reflex movements.

When the motions of the child are somewhat obscure, but little reliance can be placed on them, as a sign of pregnancy, for "Spasms of the abdominal muscles & flutters of the bowels", may both by the

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mother, and the Practitioner be mistaken for the movements of a child; besides, some women possess the power of simulating the foetal movements, by the action of the abdominal muscles. An example of the kind, is given by Dr Blundell, and another by Dr Goosch.

"When the child is very turbulent, and its motions are, in consequence, both frequent and violent, the sign becomes so strongly marked, that without looking further, it may be inferred that gestation has commenced."

4. Quickening. Strictly speaking it refers to that moment of pregnancy when the foetus becomes endued with life. Though this is an error, which the continued use of the term is calculated to foster and prolong among the unlearned, yet to those who know that life pertains to the elements of the future being, while still microscopic, it is convenient as shortly expressing a most commonly experienced sensation.

The definition given of Quickening by Dr

Dewees is correct, he says, "By quivering we are to understand the first perception the woman has of the child's muscular action"; which, if it is the sole cause, as is most probable, of the peculiar sensations experienced by the mother, would enable us to discern as one sign of Pregnancy, the motions of the foetus, and quivering. For it is a fact, not less important than singular, that the motions of the foetus may in many instances be felt by applying the hand to the abdomen, while the mother had no perception of them.

But Dr Rouston, and others, suppose "quivering to be coincident with, & resulting from, the sudden ascent of the uterus out of the pelvic cavity." This view is opposed by Dr Montgomery by the following fact, that in a case he met with, the uterus could be distinctly felt in the abdomen, and the child within it, and yet the lady did not quiver for some time after.

The period of pregnancy at which this phenomena commonly occurs is between the 10th and the 25th week.

J. Hamilton states "that quivering takes

place at the end of four calendar months after conception." This nearly agrees with the result of Dr Montgomery's observation, that the greatest number of instances will be found to occur between the end of the 14th or 18th week after the last menstruation.

A number of circumstances, however, render this sign of little value, comparatively. In the first place there are numerous examples recorded of women, who have supposed, ~~them~~ ~~to be~~ and firmly believed that they had quickened, when no such thing had occurred.

Again, this occurrence is sometimes absent during the whole period of gestation, notwithstanding the subsequent birth of living and healthy children. Montgomery, Gooch, Gardien, Baudelocque & Levet all mention having met with one or more instances of this nature.

More frequently quickening is postponed. "There are some cases" says Johnson, "where the motions are not felt till near the end of the reckoning."

Baudelocque mentions that some of his patients did not quicken until after the

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Sixth or seventh month.

It is unnecessary to dwell longer on the other signs included under the presumptive evidences of Pregnancy, such as, nausea & vomiting, salivation, enlargement & sensibility of the breasts. &c. &c. We, therefore, pass on to the consideration of the Probable Evidences of Pregnancy.

These are obtained from "the altered condition of the uterus itself, which, increasing in size, ceases to be a pelvic organ, and rises into the abdomen, which in consequence becomes enlarged and prominent, and a corresponding change is effected in the state of the umbilicus; while at the same time certain alterations take place in the os and cervix uteri, affecting their form, texture, &c. which we can recognize by touch". *

1. Enlargement of the abdomen.

Dewees & Burns both state that this is one of the most equivocal of the signs of

* Montgomery's Evidences of Pregnancy.
p. p. 38, 39

pregnancy. but Blundell, while he acknowledges that to the inexperienced it is a most uncertain sign, holds "that the more expert accoucheur may often form a very just opinion as to whether the woman be pregnant, or not". Montgomery is also of his opinion. And certainly in the generality of cases, the feel of a circumscribed tumour of an oval form, occupying the front of the abdomen, from the brim of the pelvis to the umbilicus, is a strong indication of the existence of pregnancy.

But in many cases where Pregnancy is complicated, or simulated it is either impossible to recognize an enlarged uterus, from dropsical effusions, tympanitic distension or deposition of fat in the abdominal parietes, or when to be felt to say whether it be due to suppressed menses, or to contained moles and hydroids.

2. State of the os & cervix uteri

A part of the cervix uteri both in the virgin and in the female who has borne children, projects in a papillary form, from a quarter

to half an inch into the vaginal cavity.

In the virgin the part so projecting is slightly "tapering, and conical in form". and feels remarkably firm. the os or mouth is of a transverse form, with well defined and firm lips.— when open, the finger may sometimes be insinuated to the depth of an eighth of an inch, at other times it gives to the finger, the mere sensation of a depression.

Impregnation having been effected, the os uteri is sealed up by an adhesive secretion.

As gestation advances the cervix is more projecting, and at the same time feels softer and more elastic; while the orifice now becomes circular.

Altho' these changes commence, and are in progress soon after conception, they are not to be recognized with any satisfaction before the third month.

Kennedy says "there is really little change in the length of the neck, until after the 5th month, when it begins to shorten". it also swells out at its upper end, which is gradually becoming a part of the body of the

uterus. This dilatation proceeds steadily, as the gestation advances, so that in the 6th, 7th & 8th months, there is less and less projection of the neck of the uterus. And in the 9th month, it is almost obliterated. And now the uterus forms a convex roof to the vagina, instead of projecting into it.

It must, however, be borne in mind that these changes in the cervix and os uteri do not proceed always in this regular manner.

"In some, the neck is found as long in the 8th month, as it is in others, at the sixth."

"Again cases will occasionally be met with in the 7th & 8th months, and even in women in labour at the end of the 9th month, in which the neck of the uterus, may be found unobliterated & projecting a considerable way into the vagina."

Besides, there are other conditions of the uterus, besides pregnancy, by which the changes described may be produced, so as to assume almost exactly the characters of those that accompany the earlier periods of gestation.

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We at last arrive at the proper subject of this dissertation viz, the consideration of the microscopical, and auscultatory evidences of pregnancy.

The microscopic evidences depend on the existence of milk in the Breasts, and Kreteine in the Urine, ; the auscultatory, on the sound of the foetal heart, and the placental circulation. — The first, we consider, as Probable evidences, and the latter as unequivocal evidences of the existence of pregnancy.

And, First. Of Milk in the Breasts as a sign of Pregnancy.

The secretion of milk in the Breasts is popularly esteemed, as an infallible proof of pregnancy, but, among Obstetricians a variety of opinions have been held, as to the importance that should be attached to the secretion as a means of diagnosis.

Blundell's opinion is, that now and then, from a secretion of a fluid, serous, milky, or of mixed character, you may form a notion whether gestation be, or not begun. But you should not infer there is pregnancy, merely because there is a secretion of milk

Montgomery in like manner says "we should
 "attach great importance to the presence of milk
 "in the breast, and if found in connection
 "with others of the rational symptoms of pregnancy
 "it ought to go a great way in confirming
 "our belief of the existence of that condition,
 "especially if occurring in a woman who had
 "never borne a child, or been pregnant before,
 "but altogether it is a sign which we cannot
 "expect in general to make available as a
 "guide in forming our opinion in a doubtful
 "case".

Churchill again speaks more strongly, he
 pronounces it "an evidence scarcely of any
 "value at all".

Those on the other hand who speak in its
 favor are few and I know only of one,
 viz Dr Peddie, who has strongly advocated
 its importance. It is his decided opinion
 "that it is a sign which will never be found
 "to fail in regard to those who are pregnant
 "for the first time, or in regard to those
 "who are not pregnant at all." and
 that in general it is more certain in its
 information as a corroborative evidence of

evidence of pregnancy than the papular areola. And, again, he says, "that compared with any of the ordinarily recognized signs for distinguishing a first pregnancy from a simple suppression of the menses, before any bulk in the iliac or hypogastric regions can be distinguished by the eye or hand, or before the ear can observe the unmistakable sounds of placental or foetal circulation, there will be found I think far fewer exceptions to the milk test".

To decide, therefore, for ourselves as to the value of the test, let us inquire into the nature of the secreting structure, and the circumstances which influence or call forth its secretion.

We do not go far wrong when we state that there are no two other organs in the economy so connected by the mysterious sympathetic union, as the uterus and the mammae. When the one suffers, the other suffers with it - when the vital actions are from any circumstance increased in the one, it is the same with the other - and there are but few exceptions (for exceptions

these must be) to this general law.

But while this sympathetic connection is so strong & noticeable, it is at the same time harmonic that is to say, the changes in the one is commensurate with the action in the other; the vital actions in the one do not hurry on, while in the other they are proceeding slowly. But they, as it were, go hand in hand. So that in the early years of life while the uterus remains undeveloped, the mammae are equally so, they present at this time no difference from the same structure in the male; but as soon as the period of womanhood arrives, and the menstrual flow is established, the mammary gland enlarges & becomes greatly evolved, so that some of the laticiferous tubes may be injected.

Then, again, when impregnation occurs, and the uterus in consequence enlarges, slowly but steadily, the mammary glands are correspondingly affected, they enlarge, & become extremely sensible, while pregnancy advances & the uterus and the other generative organs are being prepared

5.
For the safe expulsion of the foetus, in like manner the mammae grow and become in every way fitted for its subsequent nourishment.

The change in the mammae which is effected by this wisely ordered sympathetic union is the development of the secreting apparatus; it being a general rule, that no organ in the economy can maintain its vigour without its being called into action.

Now, since it is evident that there is this developing change in the structure of the secreting apparatus from the very first, there must be also a secretion from it which, at the beginning has but little of the character (though undoubtedly some) of the true secretion, but it attains more & more of the full development, according to the progressive changes in the uterus &c.

The period of pregnancy at which this test is of most value is at the end of the second, & the beginning of the third month.

At this time, it must be remembered, that the fluid does not trickle from the nipples, as it frequently does in the last

mouth of pregnancy, "but the fluid must be
 "brought; and the method of obtaining it, under
 "doubtful circumstances, is to press the finger
 "and the thumb firmly on the mammary
 "gland, a little beyond the margin of the
 "areola, and then draw them to the point
 "of the nipple with a stripping and encompassing
 "movement. This repeated three or four
 "times, will certainly bring fluid of any be
 "present".

To ascertain the true nature of this secretion
 (of which merely a drop will suffice) it must
 be submitted to microscopic examination.
 In ~~a~~ a little moisture from the sebaceous
 follicles of the areola, which is sometimes
 produced during these efforts may be mistaken
 for a lactic secretion.

A drop of the expressed fluid, if truly a
 lactic secretion, will exhibit under the
 microscope, the characteristic milk globules.

Agglomerated en masse, varying in size
 from molecular spots to pretty large globules.

Mixed with these groups will be perceived
 "an abundance of large oil globules and
 "colostric granules, as in the green milk

of recent parturition

We are, therefore, inclined to hold, with but few exceptions, that if a fluid can be expressed from the breast of one who had never previously been pregnant, bearing all the microscopic characters stated above, while there was no morbid state in the system likely to cause irritation of the mammary glands, that this test is almost infallible.

Dr Peddie gives in his admirable communication to the Monthly Journal for August 1848 two instances, where he was enabled by this simple test to pronounce on the existence of pregnancy. "the one, was an unmarried young woman who attempted to conceal her pregnancy; and the other, a young unmarried lady, who was not aware of her own condition; and whose station in life, education, and previous good conduct, was a protection against an early suspicion of her case. Both were convicted by the milk test, when the ordinary signs excited only a vague suspicion; both soon confessed their

"transgression; and both were, on the strength
 "of the opinion given, immediately placed
 "in the bonds of lawful wedlock".

However, it is only in a first pregnancy
 that the milk test can be applied with any
 confidence, "for when a woman has once
 suckled the fluid is apt to linger in
 "the breasts a considerable time after
 "weaning, and the mammae continue
 "performing a partial function."

It may be obtained with but few exceptions
 from three to six months after pregnancy.

Dr Reddie mentions that it was present
 in one case, that fell under his notice
 after the lapse of two years.

Dr Francis in his edition of Denman, mentions
 on the authority of Professor Port, that "a lady
 "of this city (New York) was, almost fourteen
 "years ago, delivered of a healthy child;
 "since that time her breasts have regularly
 "secreted milk in great abundance, so
 "that, to use her own language, she could
 "at all times easily perform the office of
 "nurse. She has uniformly enjoyed
 "good health, is now about thirty five

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"years of age, and has never proved pregnant
"a second time, nor had any return of her
"menses".

But it is undoubted that the secretion of
milk may arise independently of impregnation.
"For it has been witnessed in the unquestionable
"virgin, in the superannuated female, and
"even in the male sex."

Constant irritation of the breast by suckling
was to elicit the secretion is known to
cause its establishment. Perhaps the
most remarkable case of this nature
recorded, as occurring in the female sex
is that of the little girl at Alencou, only
eight years of age, who suckled her
brother in the space of 9 months. She was
produced by Baulbecque before the Royal
Academy of Surgery on the 16th of October
1783, where she suckled her breasts in the
presence of the members. The secretion
was caused in her by the repeated application
of an infant which her mother was suckling
at the time.

A most interesting account is given by
Franklin in his journey to the Polar regions

of the secretion of milk under the same circumstances in a young man.

"A young Chipewyan had separated from
 "the rest of his band for the purpose of trapping
 "beaver, when his wife who was his sole
 "companion, and in her first pregnancy, was
 "seized with the pains of labour. She died
 "on the third day after giving birth to a boy.
 "The husband was inconsolable, and bowed
 "in his anguish never to take another woman
 "to wife, but his grief was soon in some degree
 "absorbed in anxiety for the fate of his infant
 "son. To preserve its life he descended to
 "the office of nurse so degrading in the eyes
 "of a Chipewyan as partaking of the duties
 "of a woman. He swaddled it in soft
 "wool, fed it with broth made from the
 "flesh of the deer, and to still its cries
 "applied it to his breast. The force of the
 "powerful pepions by which he was actuated
 "produced the same effect in his case, as
 "it had done in some others which are
 "recorded; a flow of milk actually took place
 "from his breast, and he succeeded in
 "rearing his child."

Professor Hall of the University of Maryland exhibited to his obstetrical class in the year 1827, a coloured man 55 years of age who had large, soft well formed mammae, rather more conical than those of the female, with perfect and large nipples. This man had officiated as wet nurse for several years in the family of his mistress, and he represented, that the secretion of milk, was induced by applying the children entrusted to his care to the breasts during the night. The genital organs were fully developed.

But, again, the secretion may be established independent of direct stimulation of the mammae, by an indirect sympathetic irritation caused by morbid changes in the uterus. Thus, when the uterus becomes distended with any false conception or hydatid accumulation, even in those who were never pregnant, but more especially in those who have already borne children, the mammary secretion is sometimes established.

In bringing my remarks on this point to a conclusion, I would remark, as

I did before, that in a first pregnancy, where the system is free from every morbid condition that the presence of the milk in the breasts is an infallible indication of pregnancy, with the few exceptions where the secretion by imitation of the mammae may be solicited & obtained - In subsequent pregnancies it is not to be relied upon -

And in pregnancy simulated or complicated it is an indication of no value whatever.

2. Kiestine

No satisfactory case has been recorded by those who have devoted attention to the pathology of the urine, in which the true lactic secretion has been found in the urine. "All the cases of milk like secretion where no fraud has existed, are instances of phosphatic, 'involent', or fatty urine."

But it is undoubted, that some of the constituents of milk may be met with in the secretion of the kidney, by a kind of vicarious action of those organs -

This peculiarity in the urine of pregnant women, has long been a matter of popular

belief, and so far back as the year 1486
Savonarola mentions with great accuracy
the changes in the urine of pregnancy. which
to this day may be observed.

Up to about the sixth month, according to
this writer, "the urine is clear, and of a
"pale citrine colour, with a cloud on its
"surface; and about the middle of the fluid,
"a deposit like carded wool; but as pregnancy
"advances towards its close, the urine becomes
"redder, and turbid when stirred."

In recent times, M. Karche demonstrated
that the urine of pregnant women contained
a peculiar substance, which he called *Kristine*.
and the following is the description he gives
of it. "By allowing the urine of pregnant
"women, or of nurses to stand for some time,
"in thirty or forty hours a deposit takes place
"of white, flaky, pulvulent gummy matter,
"being the caseum, a peculiar substance of
"the milk formed in the breasts during
"gestation. The precipitation is more
"readily procured by adding a few drops
"of alcohol to the urine."

No attention was paid, however, to this

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Observations, till M. Sanchez published his own researches in the Lancette Francaise.

In this country, Dr Golding Bird was the first to take up the inquiry, & the results of his investigations appeared in the Guy's Hospital reports in 1840.

Since then, it has attracted attention in America. and in 1842 Dr Kane of Philadelphia experimented upon himself, & laid the results of his researches before the Profession in the American Journal of the Medical Sciences.

Let us now pass from the history and origin into the Period of formation, & its appearance, both during and after the complete formation of keistine.

The urine of pregnancy undergoes but little change within the first 36 hours - the first appearance is in the form of a cotton like cloud; this, however, is not an uniform phenomenon, according to Dr Kane, of the succeeding changes, and it may be seen where there is no pregnancy to account for it.

In lapse of time, the "cotton like cloud" becomes resolved into a number of minute

opaque bodies, which rise to the surface forming a fat-like scum. The time at which the pellicle begins to form varies considerably. At the end of 36 hours I have seen it well marked, and again he has seen it make its first appearance as late as the 8th day.

At first it is hardly discernible, but about the 5th day it is fully developed. It now presents a continuous scum of an opaline white, or creamy appearance with a slight tinge of yellow, which gradually becomes deeper and more decided.

When fully formed a number of crystalline shining points appear. It is now not unaptly compared to the "fatty scum of cooled broth".

This appearance remains permanent for three or four days, the urine then becomes turbid, the crust cracks, & minute flocculi detach themselves from it, and sink to the bottom of the vessel; this action continues till the whole pellicle disappears.

Dr Golding Bird states, as one of the characteristics of Kestone, that it has a caseous odour; this is indeed well marked

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in some instances, however it is not to be
depended upon, for other observers have
failed in many instances, in perceiving the
odour. ~~But~~ I have detected it in
only 7 cases. Some of the pellicles of great
thickness were without it, and in two
presenting it, the pellicle was very thin,
and not well developed.

Dr^s McPherson & Perry were unable to
perceive the caesous odour in 27 cases of
kristine they procured.

Microscopic examination. To procure
kristine for microscopic observation I find
advise that a slip of glass should be plunged
perpendicularly into the fluid, and then
withdrawing it ~~longitudinally~~ ^{adroitly} in a nearly
horizontal position: an equal layer of the
substance is procured, "which appears
glistening with a lustre like spermaceti."

When placed under the microscope, and
examined with an object glass, of a quarter
of an inch focal length, it appears to consist
of an amorphous matter composed of minute
opaque points, mixed with which may here
& there be seen patches of tolerably regular

17.

globular bodies, and imbedded in this
 myriads of triangular prisms of triple phosphate.
 These crystals give the peculiar shining
 appearance to the pellicle, and under the mi-
 -croscope from their distinctness, form a very
 interesting object.

Dr Simon of Berlin in describing the microscopic
 appearance, states "that the whole field of
 "vision is beset with numerous vibronia
 "in active motion, and crystals of am-
 "moniac magnesium phosphate. When the
 "pellicle becomes thicker, precisely similar
 "phenomena were observed, but the vibronia
 "were supplanted by a considerable number
 "of monads".

When the pellicle which falls to the bottom of
 the vessel is examined microscopically, it
 presents the same appearance as the full
 formed pellicle ~~but~~ does, excepting that the
 crystals are much more numerous, and all
 the animal matter present is entirely
 composed of amorphous granules, all trace
 of anything like a regular structure
 being lost.

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Of the action of reagents upon Kiestone.

The addition of acetic acid to a portion of the pellicle, causes opacity of the medium, the crystal undergoes a rapid solution, and a ^{white} pultaceous mass is left, which subjected to close microscopic scrutiny, after having been washed and dried exhibits no trace of crystalline matter.

Dr Simon concludes from his experiments that this animal matter consists partly of a proteine compound, for on adding ferrocyanide of potassium to the filtered solution, a comparatively slight turbidity ensued, but on macerating the pellicle in a dilute solution of potash, ~~and~~ accumulating the filtered solution with acetic acid, heating and adding ferrocyanide of potassium after a second filtration, a more decided turbidity was observed.

Dr Lehmann's investigations, on the other hand, prove that the other constituent of the animal matter is a butyrous fat, for by means of ether he could always remove from this film a considerable quantity of viscid fat, which formed a soap with potash

And then, on the addition of Sulphuric acid, developed a well marked odour of Butyric acid.

Again, the addition of some strong liquid Ammoniac causes the entire solution of the animal matter, and after being washed with water, nothing can be seen under the microscope but the distinct and perfect crystals of the triple phosphate.

It may, then, be concluded that Kestine is a mixture of Butyraceous fat, phosphate of magnesia, and a protein compound very similar to casein.

Theory of its formation. It is probable that during pregnancy casein is formed by the direct conversion of the albumen of the blood. The retention of this imperfectly formed secretion in the blood is attended with injurious consequences, so that we may conclude the presence of Kestine in the urine is due to a vicarious action performed by the kidneys, before the peculiar principle is separated along with the other constituents of the milk from the

mammæ.

We next come to consider the question, whether kistine is always formed during pregnancy, and whether it is never seen in the urine of non-pregnant females?

Dr Simon says, "I have examined the urine during the 2nd, 3^d, 4th, 5th & 6th months of pregnancy, but have not invariably detected kistine".

Bird mentions, that out of 30 women of pregnant women examined by him, three did not present the copious fat like pellicle.

And a case occurred to Moller, where no kistine formed, though the existence of pregnancy was undoubted.

It is remarkable, however, that in all these exceptions, the persons from whom the urine was procured, were all labouring under some morbid condition at the time. Thus, in the case mentioned by Moller, the female was labouring under severe catarrh, and in Dr Bird's three cases, all the three were affected with inflammatory fever, ac-

21.
- accompanying severe catarrh. -

In all these cases, as soon as the disease was subdued the characteristic kuestine appeared in the urine. -

I am inclined to think, that in those instances - if any do occur - where there is no morbid condition to account for its absence, it must be accounted for by the establishment of the mammary secretion, from some unusual cause. -

Again, it is stated that this peculiar substance is sometimes seen in the urine of those who are not pregnant, Miller relates two instances of this sort, in one case there was considerable hypertrophy of the uterus; in the other, no affection of the generative organs could be detected.

Dr Kane states that a kuestine-like membrane may also appear in the urine of persons with phthisis, arthritic metastatic abscess, vesical catarrh &c. However, altho' in these instances, there is a considerable resemblance to the true kuestine of pregnancy, it is generally acknowledged that it differs from it, both

in the manner of its formation, and its destruction. The stratum in the cases alluded to, does not appear so quickly on the surface of the urine as kristine does, and also, instead of disappearing, as it is found to do, in the course of few days, it (the former) goes on increasing in thickness, and ultimately becomes converted into a mass of mouldiness.

"Every urine", says Simon, "left to itself forms a pellicle more or less resembling that of kristine. If formed soon after the urine is discharged it consists of earthy phosphates, which, from the urine being alkaline are, in the most part precipitated, but likewise form a delicate film on the surface. When this is the case the pellicle is very thin & readily sinks to the bottom. Under the microscope crystals of ammoniacal magnesian phosphate, and an amorphous matter very similar to kristine, but consisting of phosphate of lime are observed; this likewise differs from kristine in being soluble in free acids.

The pellicle of fat on the surface of urine

"may sometimes be mistaken for Kiestine,
 "films of this nature are very thin and
 usually iridescent, and under the microscope
 "reveal the presence of numerous fat globules.
 The membrane formed on the surface of
 urine 6 or 8 days after emission usually
 consists of a species of mould; under the
 microscope these may be seen numerous
 filaments matted together and inter-
 spaced with spores.

"I once observed a pellicle on the surface
 "of a man's urine three days after emission
 "which both in chemical and microscopical
 "character presented the closest analogy
 "to Kiestine".

The next questions which engage our attention
 are the following - How soon in the course
 of pregnancy may Kiestine be formed? and
 during how long a period may it continue?

From all that we know of the nature of
 Kiestine, and the relation which exists
 between its formation and the existence of
 pregnancy, it would seem probable, that
 as soon as gestation has fairly commenced

we may expect to find it in the urine.
 Accordingly, Kleybolte has reported that
 he detected Kristine in the urine on the
 fifth day after conception - Dr Bird
 mentions that the urine of a woman, who
 considered herself to be at the end of the 2nd
 month of her pregnancy, yielded a well
 marked pellicle. -

The amount of its formation will be in accordance
 with the advance of pregnancy, and
 especially with the changes proceeding in the
 mammae.

Dr Kane says he rarely observed it during
 the first weeks of pregnancy, and he
 most commonly noticed it during the
 7th, 8th & 9th months, and up to the period
 of delivery - But that it may occur
 prior to these periods is undoubted, as
 appears from some of the cases given by
 Dr Bird, and one which occurred to
 myself, where the pellicle was well formed
 in the 6th month.

In regard to the period, during which Kristine
 may be formed. Dr Kane mentions that it
 occurs during the period of lactation,

especially when the secretion of milk is at all checked. Accordingly, he found it in 32 out of 94 cases examined during lactation.

Dr Bird again, states that altho' it ~~is~~ is extremely probable that the vesicular peltile may be met with in the renal secretion of nurses whilst suckling, yet he never met with an instance of this kind. - and he gives the following interesting case as being opposed to the view of its being present during lactation.

"Oct 26. 1839. I was consulted by Mrs G -
 "then in the third month of utero gestation,
 "on the case of her child, a boy sixteen
 "months old, whom notwithstanding her
 "pregnancy, she was then suckling. This
 "little patient had a severe attack of
 "pneumonia following measles, from which
 "he was recovering, when, a few days before
 "I was called in, from imprudent exposure
 "to cold, he contracted bronchitis; and
 "when I saw him he was evidently dying:
 "his face was pale, lips livid, and
 "extremities cold; he had however,

insufficient strength to take the breast. As it
was evident that the child would in all
probability expire in a few hours, I was
anxious to ascertain whether the urine of
the mother contained any of the supposed
causous matter; and if not, how long after
the death of the boy it would appear.
Some of her urine was accordingly collected,
and after five days repose, it underwent
no particular change; putrefactive
decomposition then ensued, and it was
thrown away. She continued to
nurse her child until within a few
hours of its death, which took place
fortyeight hours after my first visit;
and on the following day I procured another
specimen of the mother's urine: this,
after two days repose, had a thin
causous pellicle on its surface. In the
course of a week a third specimen
was procured; and this in three days
became covered with a complete creamy
layer, evolving a strong cheese like odour.

On the value of Kristine as a sign of Pregnancy —

As with the other signs which we have discussed, so with this, there has been a variety and a contrariety of opinion expressed, as to its value as a diagnostic of pregnancy —

Some maintaining the Kristine to be ^{pathognomonic} ~~diagnostic~~ of pregnancy, others expressing a conviction of its utter worthlessness.

The following is the conclusion to which Dr. Montgomery comes "In some instances, no opinion can be formed as to whether the peculiar deposit existed, or not, on account of the deep colour, and turbid condition of the urine" and again, "there are such a host of accidental circumstances capable of altering the condition of the urine, as ought to make us very cautious indeed how we venture to attach credit to a symptom so equivocal"

Dr. Carpenter says "that the presence or absence of Kristine in the urine may probably be regarded as a valuable diagnostic sign"

Dr. Peattie thinks "that the presence of

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"Kristine is a very important evidence of
"pregnancy" J. S. Golding Bird, is of
"opinion, "that as a test for the existence
"of pregnancy, the formation of Kristine will
"be an extremely valuable corroborative
"indication".

We have already stated that in certain
morbid conditions the urine presents a
pellicle very similar in appearance to the
true Kristine formation of pregnancy, but
that such formations may be distinguished
from that of pregnancy, by noticing their mode
of formation, and disappearance - the mi-
-croscope characters, and the action of reagents
upon them.

We are therefore inclined to hold that
Kristine, properly so called, is a formation
quite peculiar to pregnancy, and characteristic
of that state. And that when formed in
the urine of suspected pregnancy it may
be taken as an unequivocal indication of
the existence of that condition - But, as we
before said, Kristine may be formed
though pregnancy is undoubted - in these
cases, it would appear, its absence

is also accounted for by the presence of certain inflammatory affections, which while they exist prevent its formation - on the departure of these morbid states, however, the pellicle again forms in the urine.

M. Paruchon examined the urine of 25 pregnant females, and he found Kristine in every case - 17 out of the 25 were between the 4th & 9th month, and 4 had not quickened. They considered themselves as labouring under some disease of the womb, and the remaining four patients who had been under treatment for cerebral complaints - one for ascites, another for sciaticea, a third for ulcer of the neck of the uterus, and the last cancerized twice for pretended disease of the uterus - In none of these cases had the existence of pregnancy been suspected, altho' in every one the fact was placed beyond doubt.

Dr Bird in like manner detected pregnancy in two females who presented themselves who treated for amenorrhoea - In both the formation of the pellicle was well marked

The one was a servant girl 18 years of age, whom I vividly suspected to be pregnant, from the condition of the areola, but she was so much annoyed by his questions, that she ceased to attend.

"The other, was a stout, tall, unmarried woman, a servant, aged 33, who came under my care Nov 7. 1839, suffering from cough, apparently depending on deranged digestive functions, and relaxed womb: she had not menstruated since the preceding May, and attributed the disappearance of the catamenia to exposure to cold. She had morning sickness, and the veins of her lower extremities were varicose. On examining the abdomen no evident enlargement of the uterus could be observed, in consequence of the periton being loaded with fat. And on looking at the breasts, the nipples were found surrounded by a large purplish brown areola. On being charged with pregnancy, she obstinately denied it; but admitted having been the mother of an illegitimate child eleven years previously. She

"declared that she had preserved absolute
 "chastity since that period, and wept bitterly
 "at my (as she termed them) unjust
 "suspicions. I exposed ~~her~~ a specimen
 "after urine, and exposed it in a lightly
 "covered glass cylinder: in two days a
 "dense pellucid spot like matter formed:
 "this increased in thickness during three
 "days, and then evolved so powerful an
 "odour of putrefying cheese, that I was
 "obliged to throw it away - Five
 "months later this woman was delivered
 "of a male child."

If this test then - as it is, is so valuable an
 indication of pregnancy, it is also one that
 can be made independent of the female, &
 without exciting her suspicions; and on the
 other hand in cases of suspected pregnancy,
 it enables us to form an opinion without
 affecting the delicacy of the female.

James A. C. Hutchinson.