A Thesis

On the Condition of the Nervous System in Pregnancy:

Its Functional Diseases and Their Treatment.

Presented for the Degree of M.D. to the University of Edinburgh

by

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The condition of pregnancy physiologically entails great changes throughout the entire maternal organism, which affect in more or less degree all the systems of the body. These changes depend to a large extent on the altered nutritive requirements; and though they show, as might be expected, great variations in different subjects, according as the different systems respond to the strain imposed on them, they are an essential accomplishment of pregnancy. These observable in all instances of the condition.

And it is not surprising that this should be the case, for pregnancy means a dynamic change: for the time being in the direction of some of the great currents of energy, it a change amongst others in the quality of the blood. The nutritive requirements of the organism are altered and metabolism arranges itself upon a new basis, conductively

* Mental Disease. CLEVERTON. p. 56.
along these lines, amid new changes, with a double object. It is rather evident that important effects must result in the various systems from the new conditions imposed upon the organism.

In the nervous system, a considerable number of changes are noticeable, most of a purely functional character, though varying in different cases in intensity. They affect in some instances to be a primary result of pregnancy itself, to a certain extent the outcome of a subtle psychological state, for "psychologically, pregnancy is the fulfillment of the second strongest organic necessity of life — the reproduction of the species." In other cases, they may be secondary to changes going on in other systems, or to alterations produced in the general bodily metabolism.

Of the many changes incidental to pregnancy, none have a more important bearing on the development of nervous
Phenomena which the alterations taking place in the composition of the blood.

The blood is of necessity profoundly altered during pregnancy. To meet the requirements of the greatly increased vascular area throughout the body, the blood undergoes a watery dilution; its serum becomes qualitatively poorer in albumen and in cellular corpuscles, though this is at the same time a material increase in leucocytes, fibrin, & connective matter. The condition in the newborn, normally one of hydropsic anaemia, hyperkinosis, and cachexia, whose essential nature has done so much to increase our knowledge of the blood changes in pregnancy, seems, thanks to theSearch plate on earnestly analogous to chlorosis. In the case of most women, this is no doubt correct; for the first time during pregnancy, the often unfavourable conditions in which nourishment and hygiene have to be maintained, tend undoubtedly to the production of an anaemia of this type. But Willcocks has shown...
Mal Chrys. bulk for bulk, the blood in pregnancy like that in chlorosis has a smaller percentage of haemoglobin, yet in pregnancy the blood cells are not individually proven in this substance, as they are in chlorosis. Much depends known on the period of pregnancy at which the estimation is made, for Feßling* in 1881, Meyer† in the following year, have drawn attention to the fact that though both the red corpuscles of the haemoglobin percentage are in some measure diminished during the early month of pregnancy, in the later months there is a decided increase in the proportion of both; and Toldt also found that so soon as the balance of nutrition becomes established a steady increase in the haemoglobin and the number of corpuscles is to be observed. It does not appear, however, that the actual haemoglobin value of individual cells is increased, but only the total haemoglobin percentage; so that apparently the improvement is more quantitative.

† Meyer. Archiv f. ärztliche. 1882. II. 831, 482.
It is significant that in normal pregnancy, when the blood condition is at its best, there is always a deficiency in the compass-anemic number of red cells. In spite of the evident effort of nature to effect an increase in this number, the blood remains dilute to the end of gestation, no matter how good nutrition may be. The blood state must therefore be one of great physiological strain; and as few women are absolutely healthy at the time of conception it is not surprising to find very considerable anaemia often in the course of pregnancy. There may be impoverishment then of the individual cell in addition to deficiency in the number of cells, — a condition, in short, of chlorosis: and as this type of anaemia is common in the early months of pregnancy, it is frequent, as a complication of pregnancy may be expected.

The influence of anaemia in the production of certain morbid states of the nervous system is well known; and it is a curious fact that many of the disorders which have been attributed to it, — such as abnormal reflex excitability, cerebral irritability, neuralgia, hemiplegia, neurasthenia, —


insomnia, & the functional disorders, exist quite frequently during pregnancy, and then an account provisioning that many symptoms of functional nervous disease occurring in that condition are associated with improvement of the blood supplied to the nervous centers. Megnitz claims that the melancholia sometimes present in pregnancy is the result of an anaemia condition of the central centers, and we know that cholera, hysteria, neurasthenia, vomiting, & a number of other functional derangements, have been so associated.

But it is difficult in the present state of our knowledge to distinguish effects produced by anaemia from those due to causes underlying the accompanying anaemia, and it is not from an clinical grounds alone to say what nervous symptoms, or what degree of any one symptom, are due entirely to mere deficiency of blood circulating in the nervous centers. Writing of spinal anaemia,
Oliver states that there may be extreme grades of anaemia of the cord without symptoms, and that obvious symptoms are not often present; neither in chlorosis in primiparae, anaemia; and even when observe he thinks that clinically they are in no way characteristic. But he admits the possibility of important changes taking place in nervous elements after great haemorrhage; and many obstetricians know that after severe uterine haemorrhage, or other great blood loss the symptoms of brain and spinal anaemia are often present in marked degree. I have seen the knee jerks greatly exaggerated after severe post-partum haemorrhage, and have indeed found substantial evidence not only of increased spinal irritability, but also of increased central irritability.

Admitting, however, that increase in nervous excitability after great blood loss, it is rational to assume that even considerable anaemia will have its effect on the nervous system; and in a condition such as pregnancy,
where heightened reflex susceptibility is more or less always present, and where a state of blood dilution is consistent, it is logical to associate the condition, to some extent, and to expect that an excess of the anaemia will be followed by still more marked nervous changes.

In normal pregnancy anaemia should not interfere with health and should not occasion abnormal, or, I should rather say, morbid, nervous conditions. It is not possible to associate a pathological process with a state essentially physiological; and the anaemia of pregnancy is essentially physiological. The nervous excitability present in pregnancy may properly be the result of centrally acting physiological influences of which we have no gauge, and may simply show itself more conspicuously in the presence of the anaemic state; but there is no reason to suppose that it is itself the normal result of anaemia of pregnancy. So much nervous is the instability of the nervous system, that it will no doubt be easily exaggerated by very slight increase of the blood poverty.
In general, the nutrition of the patient should be not seriously affected in pregnancy. There should be an increase in body weight, progressively from the beginning to the end of pregnancy.

In the whole nine months the gain should average from 10 to 15 pounds, and is greatest in the last two months. It is curious that it is beyond that which can be explained by the presence of the growing uterus alone. If we allow for the weight of the uterus and its appendages, we do not find that there is after all a very large gain. Probably the additional weight is due to the increased amount of blood plasma circulating in the body, to the development of adipose tissue.

The increased formation of fat is in many ways a direct result of the hydramic condition of the body. The excess of water produces increased intravascular tension, abundant renal œdema, more rapid breathing, more breaking down of proteins and a greater excretion of urea; with the result that fat increases (Rutherford).
A similar effect is produced by any excess of chlorides present. Probably, however, the increase of adipose tissue, so often associated with improved nutrition, depends also largely on the efficiency of the proteins. Element on the improved ratio of blood to fat present, for we know that if the blood be impoverished in proteins, skin and fat, especially in the later months, weakness and emaciation always result.

The formation of fat during pregnancy is by many looked upon as specially beneficial. In a great sense it is incompatible with nervous or mental breakdown. It typifies the essential animal condition which makes for normality in pregnancy, and I think it should specially be welcomed in all cases where instability of the higher functions or the nervous system is threatening, or where the problem of nerve nutrition has to be faced. Moreover, it is a sign that in pregnancy due preparation is being made for the coming lactation, and the preparations of the system in this respect is always to be
Javanally interpreted. It implies the existence of that reserve of nutritive
which is the best proof of a well-organized


destation.

Influence of Blood Pressure: But it
is not only the nutritiual quality of the
blood that is concerned in the functioning
of the nervous system in pregnancies. Much
depends also on the state of blood pressure.

Dr. Barnes and other close observers
give the assurance that in the pregnant
woman the arterial blood pressure is
increased, "a fact better evidenced by
the report of the skilled finger, than by
illness of phrenographs." The precise
cause of this is not apparent; but whether
it is the result of peripheral capillary
obstruction, or of increase of cardiac action,
or whether it is due to the interpretation
of the fetal circulation, or some increase
in the total mass of blood, there can be no
doubt that it is commonly present, that
it is physiological. By some observers
it is believed to be due to obstruction in
The capillaries, and directly proportionate to the amount of uric acid circulating in the blood. But this theory is to be discarded by the fact that in normal pregnancy there is a steady upward progression of maternal metabolism, with a rise of urea and a fall in blood alkalinity, in consequence of which the blood is cleared and kept clean of uric acid. Obviouly then the theory of uricacidemia will not explain the constant occurrence of raised blood pressure as a normal condition of pregnancy.

If however the rise of blood pressure in pregnancy is associated with general capillary obstruction, there will be deficient circulation in all the tissues, the brain tissues will share the deficiency, and a number of functional phenomena, expressed perhaps by mental depression or increase of irritability, may be produced.

Abnormal rise in blood pressure during gestation may also produce symptoms from...
its effect on the intracranial circulation. The pressure here acts in a closed cavity - the cranium, and if at any time more than usually high, it may entail a certain amount of venous hyperaemia and stasis, so perhaps also some increase in the amount of cerebrospinal fluid, so that the cerebral circulation is interposed with and nervous action impaired. Severe head symptoms occurring in pregnant women, as for example cephalalgia, hemianopia, and insomnia, are capable of explanation on this hypothesis.

Recessive Metabolism and Toxaemia in Pregnancy:

As a result of the increased nutrimental changes occurring during pregnancy, there is increased formation of waste products. Many matters from both maternal and fetal organisms pervade the blood, and require to be eliminated. Their retention in the blood through any failure of the renal and other excreting organs
to discharge their function properly, is a frequent danger in pregnancy, for they not only by their continuous presence hinder metabolism and nutrition, but they exert often an action absolutely poisonous. It is notable too that they expand their toxic powers largely upon the nervous system, particularly when this system is highly developed or specially excitable. Hence, in pregnancy, their effects become the more dangerous.

Quite a number of substances formed in the recessive metabolism of pregnancy have been credited with the production of abnormal nervous symptoms when not properly excreted. Urea, uric acid, creatin, the potassium salts, and the so-called "fatigue products" are among the examples. We know that urea is increased during pregnancy, and that its diminished renal excretion has, by Braun, Davis, Hermann and others, been associated with nervous irritability, and the development of eclampsia. We know too that creatin and creatinin are
The substances held responsible by Dubrussen\(^a\) for the cerebral cortical excitability in pregnancy; and we have still further the assurance from Haig\(^b\) that the toxic material is uric acid, which floods the blood, and acts up headaches, fits, mental depression, asthma, and other morbid states during pregnancy.

But it is neither the accumulation of nitrogenous waste nor uric acid, as some have thought, a surplus of potassium combined with a more or less toxic colouring matter that renders the toxicemic conditions in pregnancy so intense and so apt to produce disordered states of the nervous system. The recent researches of F. J. Réthy\(^c\), Bondad, and Mess condene to show that there is a special poison, not indeed separable, but still most certainly eliminated from the body.

It is present in healthy urine, but is greatly increased in amount during pregnancy.

\(^a\) Archiv. f. Gynäkologie Bd 43. Hft. 3.
\(^b\) Uric Acid in Causation of Disease p. 126.
\(^c\) "Urémic Expérimentale" 1881.
According to Chambrelant, the toxic coefficient of the urine in normal cases of pregnancy falls, on delivery, almost at once from 0.46 to 0.25. Blane injects the urine of several patients, both pregnant and non-pregnant, into rabbits and found that the toxic effects were far greater in animals injected from pregnant cases.

That the poison is present in the blood-serum and is not manufactured in the kidney itself is shown from further experiments of Tarnier & Chambrelant. These observers have found that the poison is from two to three times more abundant in the serum of eclamptic women than it is in ordinary blood serum. It is also found in large amount in the foetal serum.

The origin of the poison is not known. There is no satisfactory evidence of its being microcine. Probably it belongs to the class of animal alkaloids or toxins. (2) Clifford

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(2) La Semaine Médicale. No. 10, 1892.
(1b) Lyons Médicale. No. 38, 1890.
(2c) Annales de Gyneécologie. Novembre 1892.
Allbutt (a) believes it to be a toxin, possibly composite, derived from the brain, "for it is less in amount in a fasting animal, in hibernation, and in the urine after sleep."
He thinks "fatigue products" may form part of it, as more of it appears in the urine after great exertion. Leusden (b) also believes it to be a toxin, but formed from the blood in the course of metabolism.
Whatever its origin, the poison seems when in excess to produce remarkable irritant effects throughout the body. The kidney, liver, and spleen have, post mortem, been found deeply congested, with jaundice, evidence of extensive degenerative changes. The spleen is enlarged and the bold condition greatly altered. The nervous system is also profoundly affected. Rheumatism is often general, and functional disorders are frequent.
Clifford Allbutt (c) attributes to toxic action the severe headache, neuralgia, and neuritis.

(a) Allbutt, Lancet Feb. 27, 1897.
(b) Leusden, Virchow's Archiv. Bd. 42.
(c) Allbutt, op. cit.
excitability of pregnancy; also, the cholera, insanity, persistent vomiting, tetany, dyspnea, eclampsia sometimes present in the pregnant. The fact that the nervous as well as renal effects are less apparent in multiparae than in primiparae he ascribes, not to any diminished amount of the toxæmic in multiparae, but to immunity gained against the action of the poison.

Eclampsia:

In close relation to the toxæmic state in pregnancy is the occurrence of eclampsia; and although the precise pathology of this disease cannot, as Playfair says, be considered as satisfactorily settled, there is no doubt that the disease is the result of an aggravation of some condition or condition specially associated with pregnancy.

It is by no means a common disease. The proportion of gravid women attacked has been variously estimated; by Arnaud as 3 in 1000; by Martin Kelenbach as 1 in 500; by Vinay as 1 in 250. In my own series of 809 cases I have observed it
In four, all of the patients being primiparous. In one of these it occurred the day before labour; in two it occurred during labour; and in one more it occurred some hours after labour. In twelve cases reported by Kestner (a) mine began before labour, two during, and one after labour. But Goldberg (b) found in a series of 1120 that the disease was twice as frequent during labour as it was in the puerperium or before labour. Pajot's statistics are to the same effect; but Bailly (c) found that the greatest number of cases occur at the close of pregnancy, but before labour. The differences in observed in these statements are probably due to the fact, known to every obstetrician, that it is not always possible to say precisely when labour starts. The main point however, brought out in the various records noted, is that the eclampsia attacks generally come on before the termination of pregnancy.

Eclampsia is more frequent in first

(b) Centralblatt fur Gynäkologie. 1891.
(c) American Textbook of Obstetrics. p. 624 etc.
pregnancies, and if the primipara be old
the liability is increased. According to
Ohlman. In such cases also occurs more
frequently intrinsiq pregnancies; and tedious,
od difficult labors appear also to invite it.
Heredity has rarely been found to be a cause,
but Khalekh has drawn attention to the
fact that the abnormal excitability of nervous
system associated in some patients with
defective development, predisposes to the
occurrence of the disease.

Among exciting causes, labor seems to
be the chief; and pelvic irritation of any
kind may also precipitate an attack. In one
of my cases the first attack during labor
followed immediately after a vaginal
examination.

In its onset eclampsia, as its name
implies, is very sudden; but usually there
are preceding signs however slight.
Among these may be noted headache, dimness
of vision, dizziness, specks before the eyes,
loss of mental powers; a more rarely irritated
head, vomiting, epigastric pain; and
occasionally a well marked aura has been ob-
served. Sometimes too there is edema of
the hands and face, and when this is noticed
in conjunction with the other warning symp-
tom, an attack may be expected at any time.

The attack itself is essentially similar in
character to the hand mal d'Epilepsy. There is
complete insensibility, and tonic followed
by clonic convulsions of the entire muscular
system, both voluntary and involuntary
muscle being involved. The attack lasts
often two or three minutes, and the cyanosis
is profound. The patient is sometimes at the
very point of death when the spasm ceases
and respiration becomes re-established. The
coma which follows is generally deep and lasts
often for twenty or thirty minutes. Consciou-
ness may then return; but when then an
recurrent attacks at short intervals, it may
be many hours before it returns.

Very rarely there may be but one attack,
but recurrence is the rule, and the number of
attacks may be very great, as many as 80
or even 100 having been counted by some observers.

It is rare for recovery to take place if
the attacks are very frequently repeated,
and if the condition or "status" persisted for more than twenty-four hours. A diminution in frequency is generally a more favourable sign than a diminution in severity. A decrease of temperature with each attack is also a favourable sign.

In repeated eclampsia the uterine excitability almost certainly begins in labour, and delivery may be rapid. In a large proportion of cases the child is still-born; or if alive it may itself be eclamptic. According to Playfair, "When is no good reason to assume that the eclamptic condition is contracted by the child in utero."

Eclampsia is sometimes arrested and pregnancy completed if the foetus dies before the onset of labour; and in some cases, though rarely, the eclampsia is recovered from while the child lives, and the pregnancy goes on to term.

The maternal mortality from eclampsia has diminished greatly within recent years.

(a) Science of Practice of Midwifery, 1911, p. 325.
(b) American Textbook of Obstetrics, p. 627.
In 1885 Barker found it to be 32 percent in cases occurring during pregnancy, but more recent statistics place it, at the present day, below 20 percent. Death is rarely due to an asphyxia during the attack, and usually takes place from exhaustion and gradual asphyxia, the result of the pulmonary oedema and congestions. In other cases it has been due to cerebral apoplexy, pneumonia, acute yellow atrophy of liver, and septic poisoning. And finally, the toxæmic condition, regardless of complications or consequences of the eclampsia, may itself in some cases be the cause of death.

Where eclampsia does not end in death, recovery is in most cases complete. But occasionally great mental impairment and defect of memory may be left, and there may even be mental insanity. Hemiplegia has been noted in a few cases, and is usually permanent. In one of my own cases, baby-rinthise deafness, a sequela which I

(a) Barker. The Puerperal Diseases p. 125.
find no published record, was found to be present after an attack.

With regard to the Pathology of Sclampsia, a great many theories have been advanced; but undoubtedly, that which finds most acceptance at the present day is the theory of toxaemia. It has already been shown that there is normally present in the urinary accretion of pregnant women one or more toxic substances, which, retention from whatever cause, in the maternal organism is accompanied by certain well marked symptoms of poisoning; and it is thought that an under retention of these substances is the cause of sclampsia. For it has been found by experiment that in sclampsia the toxicity of the blood serum is greatly increased while that of the urine is diminished.

Whether the condition is due to increased formation of toxic matter in the body, or merely to deficient accretion, is not known; but it has been shown by Massieu and others that the kidney condition is more or less
Pathological in all cases, where the toxicity of the blood serum is increased. This condition is not necessarily primary, but may be a direct result of the irritation produced by a poison generally circulating, and therefore a state of albuminuria from kidney disease will frequently be found to be associated with eclampsia, while it is essential not in itself the cause of eclampsia. The toxæmia, indeed, "though usually associated with renal failure and dependent upon it, does not in all cases have such associations of dependence, for the disease caused by the toxæmia may occur without renal disorder." (a) Charpentier has collected 141 cases of eclampsia without albuminuria, and cases have also been recorded in which albuminuria was extreme without any signs of eclampsia being present. It would therefore seem that the cause of eclampsia is to be looked for apart from mere renal disease, so that it may properly be identified with some state of auto-intoxication.

The nature of the poison is, as I have already indicated, not yet clear. Some authors, among whom may be mentioned Bar, Belloc, and Renon, have hazarded the opinion that it is microbial, and have made careful search for a germ; but the results have not been on the whole satisfactory. It seems more justifiable that the toxin at work is of the nature of an animal alkaloid, formed in the body as the result of increased maternal foetal tissue change (a), or else absorbed from the bowel (b).

Now, even admitting the theory of a cumulative toxæmia as the etiopathogen of eclampsia, the pathogenesis is still far from clear. For assuming that the toxæmia is much more profound in some patients than in others, and produces often non irritative effects on the organism quite early in gestation, the question naturally occurs: Why is it that eclampsia is so closely associated with labour, or with the latter end of pregnancy? Why does it not occur

(a) American Textbook of Obstetrics p. 203
(b) Lancet Feb 27, 1897 (Chifferd Albrett)
earlier in pregnancy?

The answer I believe is that the pressure conditions within the abdomen at the end of pregnancy are so great as to hamper in a marked degree the renal excretion, so that what the organism could before manage, even with damaged renal apparatus, to throw off, becomes intercepted in the renal veins and retained in the blood. Eclampsia then is only a matter of time. It may come deliberately, preceded by more or less long-drawn-out preparatory symptoms; or it may be swift and sudden, without warning. Its rapidity depends merely on the original acuteness of intoxication, on the degree of stasis in the renal excretion, and on the resistance power of the nervous system.

Hence, as factors in the causation of eclampsia, we have acting not only toxæmia, but also uterine pressure within the abdomen and the excitability of the nervous system.

All these factors must be kept in view, the last named not least. All the conditions...
which cause increased irritability of the nervous system will predispose, however remotely, to eclampsia. Anaemia, high blood pressure, certain mental states, peripheral irritations, sympathetic disorders, malnutrition from albuminuria or other causes, not to speak of any primary instability of nervous system present, will, in all cases play their part in the production of the disease.

The importance of these subsidiary causes of the eclamptic state will be gathered from the circumstance that Rosensteini & Traube referred the occurrence of eclampsia to cerebral anaemia; that Macdonald, inclined to the same belief; that Taylor Smith & Herff, laid stress on the primary nervous irritability. Moreover, the fact that eclampsia is greatly aggravated by labor, pain, peripheral irritation, and mental shock, is very significant.

With regard to the treatment of eclampsia, it is both prophylactic and
curative. The preventive treatment consists in the most careful regulation of the alimentories and in careful feeding. Abnormal anaemia will then be prevented, and toxemia relieved. The condition of the renal output must be carefully observed, and if albuminuria be present, the dietetic and hygienic measures must be increased and the patient's condition vigilantly supervised. If the albuminuria be persistent, and especially if it increase or tube casts make their appearance, the question of induction of labour comparatively early may have to be considered; and if nervous symptoms, such as headache, dizziness, dimness of vision, unusual sickness, the operation may be strongly advised.

At the end of pregnancy, when eclampsia has set in, the induction of labour may best be left to nature, or forcible interference avoided as far as possible. In particular, especially if the eclampsia is severe, the patient should exhibit no extreme concern. A high vascular tension is unusual.
Compression of the carotids after the method of Thurneau may be tried; and in all cases, it is of the highest importance to secure pre
fusionation. I have used cotton oil, one drop
placed on the back of the tongue, with good
effect; and between attacks if the patient
can swallow, a full dose (60 grains) of Puls
Talapar Comp.

As early as possible the uterine membrane
should be ruptured, so as to relieve the intra-
abdominal pressure. Then if the contractions
are severe or frequent, the dilatation of
the os may safely be left to nature, the
patient meanwhile being kept well under
the influence of sedatives. I followed
this method in one case when eclampsia
commenced on the day preceding labour
and made no attempt to dilate the os
until the end of the first stage, when the
patient was placed under chloroform.
As she seemed to be then somewhat exhausted
I hastened the delivery with forceps. She
had one severe convulsion afterward but made
a good recovery.

Much diversity of opinion exists as to the
adversability of forcible dilatation of the os, of forcible delivery. But every case

should, if at all, be treated as its own indication, and, if the situation is desperate, it is

certainly very necessary to relieve the uterine as soon as possible. There does not seem
to be much harm in shortening the second stage at least, by the judicious use of the
gasps with the patient well under chloroform. Threning (is known to be avoided) on account of the irritation it

causes.

In all cases drug treatment can do much, and when it is able to keep the condition from becoming extreme then is

no need to interfere over hastily with the natural delivery. Chloroform is the greatest

aid, and should be used invariably when labour coexists with eclampsia; I

believe that it is indicated in every labour when an eclamptic state is

threatening. It is well, as Playfair has

said, to give it intermittently with some

[A.S. Seimeni 8 Prac Active Med 174 vol 71 p.331]
Sedatives having a continuous effect, as for instance, chloral. Than pain the hypodermic of chloral in 15 grain doses repeated every 3 or 4 hours, along with the bromide of potassium, and am satisfied that the urine has done hereby diminished. The chloral alone can be given repeatedly in 5 grain doses every four hours when the patient is comatose.

With regard to morphia hypodermically, than only used it in one case, the worst case, of eclampsia I have had. The patient was a primipara aged 27, of strong nervous temperament, I suffering from anaemia as well as from severe albuminuria. The first attack of eclampsia occurred during labour, while I was making a vaginal examination. I immediately ruptured the membranes, when a large amount of liquor amnii escaped. This was about the size of a shilling. I had previously resolved to try the effect of morphia in the first case of eclampsia that presented itself, and it so happens that, with the exception of chloroform, it was the only suitable drug I had with me. Therefore injected 48 c. of morphia.
subcutaneously. It began the administration of chloroform. The morphia was repeated in
24 drams every four hours, and the chloroform was given at intervals, during the pains.
Labor lasted about ten hours and was natural throughout. One injection of morphia was
given after labors, and then the patient took chloral hydrate. The total number
of eclamptic seizes was four, and all occurred in the first stage of labor. The
last one was higher than the preceding.
The patient made a good recovery. I do not
remember the amount of chloroform used,
but it was not large, a fact doubtless to be
explained by the concurrent action of morphia.

Among other drugs which have been re-
commended in eclampsia, these may be mentioned
phloracrin and the nitrites. I myself do not
see how they meet the main indications
in the treatment of eclampsia—sedation,
and there never used them. The sedative
effects of phloracrin will probably be as
well if not better, attained by free purgation.
Epilepsy:

than is nearly every instance when an epileptic patient has become pregnant
found the symptoms of epilepsy very decidedly
aggravated; and in one or two cases, I have seen the disorder make its appearance, for the
first time, during pregnancy. In one of
the latter cases there was slight albuminuria,
and I was at first of the opinion that the
symptoms were those of eclampsia; but the
occurrence I will marked epileptic figure
long after the termination of parturition, when
kidney troubles had apparently disappeared,
convinced me that the symptoms observed
during the pregnancy were those of epilepsy.
It is however possible that when aggravation
of epileptic symptoms takes place under
such circumstances, there may be a certain
toxic element present, and the condition of
the renal excretion should be diligently
investigated in all such cases.

From the various effects which pregnancy
do actually exert on the organism it is to
be expected, on the other hand, that a few cases
of epilepsy may be modified for the better
during the course of gestation, but then case, I believe are uncommon. I have only one seen the patient remain free from epilepsy afterward. This was in the case of a young married woman aged 25, whom I attended for epilepsy during her second pregnancy three years ago. The epilepsy improved very much during the latter months, without any medical treatment. There was never albuminuria. She had an instrumental confinement and made a good recovery. I attended her again in her third confinement a few days ago, and am able to say that since the seventh month of her present pregnancy there have been no epileptic attacks, and the general health has been particularly good.

This fact is the more singular inasmuch as the epilepsy previously suffered from had existed from girlhood. Apparently therefore the second pregnancy had in some way or other worked a cure. I believe however that the case is exceptional, and that epilepsy in the great majority of cases is not made worse by the coexistence of pregnancy.

But the prognosis as regards the continuance
of the bad effects after cessation of puerperal epilepsy is probably better in cases where the epilepsy has commenced or during pregnancy than in cases where it has been present previously.

The pathoogy of the condition is quite obscure. In defining the disease, Taylor (a) lays stress on the absence of demonstrable brain lesion, peripheral irritation, or toxæmia, it states that the recognition of the condition "depends on the absence of any other symptom from which the existence of structural lesions or diseases likely to cause convulsions phenomena could be inferred." A sharp line of demarcation is thus drawn between epilepsy and the eclamptic condition; and the theory of peripheral irritation of toxins previously advanced to explain the latter state must evidently, according to this view, be excluded from the pathology of epilepsy.

Most observers appear to have fallen back on the hypothesis of an innate instability of the nerve cell permitting some of them an explosion of nervous force, a so-called "nerve

(a) Frederick Taylor. "The Practice of Medicine."
storm"; though Powers is careful to differentiate between an explosion produced by excess of force, from one due to deficient resistance in the grey matter.

In any case, admitting the hypothesis of cellular instability, it is clear that the normal condition of epileptics is not likely to improve much in pregnancy. The fact that in the gravid state there is a primary excitability of nervous system, a disposition to anaemia, a condition of raising blood pressure, increased peripheral excitation, and a more or less toxic condition of the blood, is I think sufficient to discourage hope in this direction.

The treatment of epilepsy in pregnancy differs in no special manner from that of the disease in the non-pregnant. But all the conditions mentioned above as existent during pregnancy to the detriment of the epileptic patient should be treated; attention should especially be given to the regulation of digestion, the maintenance of nourishment, and the perfecting of all the secretory functions.
Hysteric:

I have occasionally heard it stated, and it seems to have been generally a common belief, that hysterical states are unfavourable to pregnancy, and, if previously present, are adversely influenced by it. The idea is quite erroneous, and would appear when based itself on the fact that such a "favourable condition," occurring amid the most unfavourable conditions, exercises on both mind and body a healthy stimulus, whereby the organism is physiologically steadied. The mental processes calmer without being depressed, and the patient enabled more completely to cultivate her self-control. Such cases, however, are the exception, not the rule; and it will generally be found that when there has been any functional nervousness or instability of the nervous organization antecedent to pregnancy, the latter condition accentuates it, and that to such an extent as frequently to erect a disease out of what previously had been merely a proclivity.

In different pregnant patients, hysterics
is apt to show considerable variation of form. Sometimes it is neurasthenia that is pictured, or melancholia, chorea, nervous anoxia, neuralgia, diathetic insipidus, asthma; and not uncommon then may be actual maniacal excitement. In the latter event only is the prognosis grave, as labor may occur during the mania, and injury to the mother or child may result; or the disease may take the form of a more chronic hysterical insanity, and persist a long while after the termination of pregnancy.

In one of my own patients, a lady of deep religious instincts, occupying an official position in the Salvation Army, a maniacal condition with violent delirium and religious delusions supervened on hysteria in the last week of pregnancy, being ushered in by excitement consequent on an idea that pregnancy was in her case permanent. Several hysterical convulsive attacks took place and in one of them she was confined. The attacks recurred four or five times within the twelve hours immediately following delivery, then ceased, and the mental symptoms subsided gradually in a day or two.
and by the fifth day of the pregnancy was absent. There was never at any time during the mania or convulsions attacks the least trace of albumen in the urine; and the character of the convulsions left no doubt of their hysterical origin.

The treatment of hysteria in pregnant patient is largely mental & moral as in ordinary case, but precaution must be taken to prevent the disease from interfering with the pregnancy. Nutriment must be well maintained, and as one of the dangers incident to the condition is exhaustion from a refusal to take food, it may be necessary to apply a rigorous Lin- Mitchell treatment; to isolate the patient from her friends, enjoin absolute quiet and rest, quiet the feeding, & stimulate the tissue metabolism, & the secretion by gentle rubbing exercises & careful attention to the gymnastics. In mild cases it especially when the physical condition is good, so strict a regime is not necessary. But the patient should be well looked after and made to feel that her condition is well understood. "As is so often seen in dealing with the
insane, it is better to attempt no deceit in their management, but to win the patient confidence by faithful and patient attention without dissimulation.

Catalepsy

This disease, in many respects analogous to hypostasia, has been noted as occasionally occurring during pregnancy. An interesting case is recorded by Stroth of Landwasser. The patient was a robust woman aged 40 with no family history of nervousness but with a history of "fainting fits" during girlhood. In the 7th month of her 12th pregnancy she was seized with cataleptic fits following the loss of a child. The limbs, when raised or bent, remained in the same position for about ten minutes. The pupils were dilated, but reacted to light. Under chloroform the muscles relaxed but the patient continued in a trance condition for hours. On awakening she remembered nothing that had taken place. The fits occurred three

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(1) Davis, American Textbook of Psychiatry, p. 221.
(2) Ibid., cit., p. 218.
or four times daily, to full term, intervals of freedom, lasting a few days, being occasionally present, especially when atropin was given. At term she was delivered of a healthy male child. I had no more attacks after the first week of the puerperium, when she had two. Shortly after the first attack her child whom she had previously been suckling was seized with dysphagia; it had a cataleptic fit, the symptoms being precisely those of the mother. The rigidity, which developed slowly during a warm bath but soon afterwards returned. Tonic cataleptic convulsions occurred and the child "died after two days duration of the cataleptic fits."

Other believes that, like trance, catalepsy occurs usually in connection with hysteria and is to be treated as such. The possibility of nutritional disturbances is to be remembered. The patient should remain, as in all states of hysteria, be placed in a healthy environment to which accustomed, special care being taken to prevent any aggravation of the toxæmic condition, peculiarly present during pregnancy. The bowel of kidney condition should therefore be well cared for.

("1 Oster, Proc. & Pract. of Medicine, p. 1119.

(2)
Chorea.

This is hyper means a very rare complication of pregnancy. It is usually seen in primi-parae, and in a large proportion of cases the patient will be found to have suffered from the disease before marriage. (2) Among predisposing causes are mentioned acute rheumatism & inherited rheumatism taint, scarlatina, (6) epilepsy, other functional nervous diseases, (5) cardiac disease, (6) emotional disturbances such as sudden fright, grief, (6) and pregnancy predisposing especially to the recurrence of the disease.

In nearly all cases there is an abnormal condition of anaemia, associated with deficient nutrition & intensifying the nervous excitability. Most of the attacks occur during the 3rd & 4th month of pregnancy, (5) when the general condition may have been upset by recent vomiting, or when the system has not yet begun to recover.

(2) Playfair. Science & Practice of Midwifery p. 253
(5) American textbook of Obstetrics (Davis) p. 214
from the strain and adapt itself to the new conditions of metabolism. In 39 out of 55 cases quoted by Simpson, the attacks began before storage.

The pathology of the condition is still quite obscure. Embolism of the smaller cerebral vessels has been found, and endocarditis was mentioned in 62 out of 73 autopsy records examined by others. Sometimes the endocarditis was ulcerative.

Some observers are inclined to associate chorea with an infective process. But the most generally accepted view is that it is a functional brain disorder affecting motor cells in the motor areas. The occurrence of the disease during pregnancy would appear to confirm this view. The latter view, as also the coincidence of chorea in pregnancy apart from microbial influence.

It is interesting however to note that in the postmortem examinations of patients dying from the disease during pregnancy there have been found inflammatory changes in the cerebral

(a) Prof. Simpson. Lectures to Students. 1893.
(b) Other, Chorea in Chorea affections. 1894.
Motor t. intellectual centres lie in the spinal cord. In mild cases the cortex only is implicated, and in severe cases the whole cord is involved.

In a communication to the London Obstetrical Society, 1891, Dr. Cann has stated the case occurring in pregnant patients, as cases of true chorea, of hysterical chorea, of a mixed form. He thinks that it is rare for true chorea to occur in any but the first pregnancy, and certainly it is the primipara who shows most decidedly the typical form of the disease. In this form the movements are generally bilateral though, for a time, they may be evident on one side only. In one of my cases the movements were unilateral throughout. When bilateral the condition is more serious than when unilateral, and the movements are more severe than in the non-pregnant. The facial expression is generally vacant, but when the facial muscles are involved, as happens in a large proportion of cases, it is shaken by the most peculiar grimaces. In some cases the face is not at all affected; it even

If so, the tongue & speech mechanism appear only to suffer in the most severe cases. The respiration is likewise rarely affected, though sighing & irregularity of breathing have been noted by Romberg & others. The muscular system is nearly always markedly relaxed, the pupil an dilated. There is often considerable mental impairment and a quiet, remarkable loss of memory power.

The hysterical chorea of McCammon is a distinct variety. It occurs generally in women with a previous definite history of hysteria. The movements are sudden, more purpose-like, more specialized, as a rule rhythmic. They are not so severe or so long continued as greatly to exhaust the patient. The hands are often specially affected, and the twitching is not aggravated by motion and voluntary effort to the same extent as in cases of true chorea.

Chorea in pregnancy may be complicated by major forms of hysteria, by acute mania + delirium, by certain paralyses. Cardiac murmurs of neurotic origin are exceedingly common, and endocarditis is sometimes present.
The effect of the chorea upon gestation must in all instances be kept in view. Abortion, according to Croom, occurs in one-half of the cases, and is especially common when the disease has come on in the early months. But in mild cases treated from an early stage the pregnancy is in most cases not interrupted. In a case reported by Braxton Hicks (a) choreic contractions in the uterus were quite perceptible, the organ presenting now a then great distortion of form; yet the patient went to full term and made a good recovery.

There can be no doubt, however, that chorea forms a very dangerous complication of pregnancy. Out of 253 cases collected by Buist of Dundee (c) no less than 457, or 1 in 5 proved fatal; and other computation place the mortality even higher, at 27.3%. In a large proportion of the cases the fatal result appears to be due to complications

(a) Halliday Croom. Lectures to Students. 1893.
arising from the chorea, such as abortion taking place in an exhausted patient.

Apart from the danger to life alone, the prognosis must still be guarded. It is rare that the choric condition disappears at once on delivery. In one case indeed it continued for five months after labour.

The cessation of the movement is usually followed by great improvement in the physical condition, and the patient also becomes brighter and intellectually better. But “chorea is more apt to leave permanent mental disturbances when it occurs during pregnancy than at other times;”[6] and in cases complicated by mania or delusions the prognosis must especially be guarded, as mental defects often persist for a long time afterward.

The treatment of chorea in pregnancy is I think more difficult than treatment of the disease under ordinary conditions. This is especially the case when the symptoms...
make their appearance in the early months, and the knowledge that the disease is so serious and that yet there is the most urgent desire that the pregnancy be carried through to term, renders the position of the physician one of great anxiety.

The essentials of treatment are rest and nutrition. The patient should be placed in a healthy, pleasant surrounding, amid abundant fresh air, and enjoyed complete mental and bodily rest; while the feeding should be frequent and nutritious. Massage is not necessary, but in other respects, a modified Weir Mitchell treatment gives good results. Nevertheless in nearly all cases prolonged drug treatment is called for in order on the one hand to reduce the violence of the symptoms through quiet sleep, and on the other hand, to assist nutrition, combat the exhaustion, and give new tone. As a sleep producer, chloral in doses of from 20 to 30 grains is very satisfactory; and in this connection it is curious to note a case recorded by Fairden.
When a girl only 8 years of age had taken 60 instead of 20 grains of chloral, it not only recovered but was permanently cured of her chorea.

As a sedative the bromide of potassium may also be used, and even in large doses does not produce the cardiac weakness to anything like the extent that chloral does. It may very safely be given along with the chloral.

Sodium salicylate, roast packing, and the application of cold to the spine have been recommended by some observers, and in ordinary cases of chorea in the non-pregnant, cases in which the hysterical element was undoubtedly absent, I have seen ice-applications to the spine have a marked effect. In two cases of chorea gravidarum in my own practice I have seen antipyrine in 10 grain doses repeated every six hours do good; and as in one of these cases the movements, which began in the 4th month of gestation and continued till

(a) Davis, American Textbook of Obstetrics p. 217
The 5th day after labour, were never bilateral but limited entirely to the right side of the body, it is possible that the drug exercised in some way an inhibiting influence on the development of the disease. The dose was in this case now and then reduced owing to depression of cardiac action, and at such times it was usual for the movements to be increased. At other times the dose was nearly doubled without any arrest of the contractions. I had used the drug in a case of ordinary chorea at the Cumberland Infirmary previously, and its beneficial effect was such as to lead me to try it again in chorea gravidarum. It appears to act by reducing the reflex excitability of the spinal cord & brain, either from effect on blood pressure or from a specific action on the nerve cells; and it may be that its action in chorea is analogous to that shown by it in the alleviation of neuralgia. Its action in chorea appears to be increased when it is given in conjunction with the perchloride of iron preparations.
The value of toxic treatment in chorea has long been recognized. Troussseau was accustomed to use amylna in large doses, and more recently Powers has advised this drug to a physiological effect. Arsenic too has long been recommended as having a specific effect in the disease, and there can be no doubt that it gives striking good results, but on what grounds is not quite clear. Even however if it acts merely by improving the general condition, its exhibition cannot fail to prove of benefit. Combined with abundant and well directed feeding it has been especially recommended in cases complicated by profound mental depression and neurasthenia (a).

Occasionally in spite of all remeeds chorea in pregnancy proves intractable, increases in severity, and imperils the life of the patient. "Our only resource then is to remove the most evident cause by inducing labour." (b) This operation is not justifiable in slight cases, nor in those...

Of the hysterical form: but it should be done in all severe cases, in all cases where mania or other grave mental condition is present, and in all cases where a grave physical complication, such as endocarditis, increases the gravity of the case.

**Tetany:**

This is a very rare condition in pregnancy. I have myself never seen a case in pregnancy. The condition has, however, been well described by many observers, particularly on the Continent and in America.

The cases appear to be sporadic, and the disease is more common in women during the reproductive period. Troussseau, who first described the disease, called it "Contractions des Nourrices." Of 44 cases he found 40 among nursing women. The symptoms have been well described by Davis of Philadelphia.

According to this writer the tonic spasms begin in the muscles of the extremities, especially in those of the hands, and may extend...

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all over the muscular system; though this is rare. They are bilateral. There is no loss of consciousness. The attacks begin with a sensation of numbness and tingling in the extremities affected. They are of short duration and are intermittent. They can be stopped by application of cold, and can be increased or excited by pressure on the nerve or blood supply. Mechanical irritation of nerves remote from the seat of spasm, such as the facial nerve will produce them. "Electrical sensations of the nerves in the affected region are much increased; vomiting and diarrhoea may be present.

The prognosis is comparatively good both as to life and health. The pregnancy is not interrupted. Between the attacks, the patient is apparently normal. The disease generally ceases soon after the termination of gestation; but there may be a recurrence in subsequent pregnancies. Occasionally the disease proves fatal. Though Trousseau thought this rare, Dakin, Jackson, and others have reported one fatal case.

Meiners saw five cases and in recovery.

Albuminuria and glycosuria have each been associated by different observers with the condition. In the non-pregnant I have seen a condition of dilatation of ventricles and of intestinal tympanites present in three cases. This disease is more frequent in those where the mental condition is one of depression; and Playfair * thinks it is “probably always connected with causes producing general weakness.”

The treatment is usually successful, and consists in the promotion of nutrition and rest by every way possible. Care should be taken that the patient gets a proper amount of sleep, and vomiting and diarrhoea should be promptly treated whenever they arise, by rest and careful dieting along with medication. For the stomach the bromide of potassium or chloral may be tried, as also morphia, phenoxytonga, or cannabis indica. Chloroform is not often required, but entailing relaxes the contraction.

Causes immediately predisposing, such as bone or stomach distention, should be always treated.

* Playfair. Senior Lecturer in Midwifery.}
The Nausea & Vomiting of Pregnancy.

In the condition of pregnancy it is not uncommon to find considerable disturbance of the digestive functions, and one of the most frequent and at the same time most distressing of these is sickness. By some observers this phenomenon is classed as physiological; but others as pathological. In moderate degree it accompanies the majority of gestations, occurring according to Giles in 200 out of 300 cases. Hence the disposition to account it physiological.

But in some cases it becomes abnormal in its severity & duration, and one is then inclined to suspect a pathological cause.

It begins sometimes immediately after conception, but generally in the second month, or after the period at which menstruation would otherwise have appeared has been passed. It generally begins in the morning, immediately after the patient raises herself from the recumbent posture, and it may take the form of mere nausea, which is

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intense enough to prevent the patient from taking her breakfast, or there may be actual vomiting, coming on sharply at several times repeated, but with often no retching. The vomiting matter is usually acid, glistening mucus, sometimes bile stained, and after its ejection the patient often takes food with appetite. It has no more sickness until the next morning. Often, however, the nausea lasts far into the day, is increased by the taking of food, by movement—especially in the erect posture,—or induced by excitement of any kind. If vomiting takes place repeatedly, it is accompanied by retching which is often distressing. In the latter part of the day the stomach is often able to retain a small quantity of food, and the vomiting then ceases. The patient may even take a very hearty meal towards evening without the slightest discomfort.

Such cases occur frequently in practice and require little treatment, it being rare for the general nutrition to be seriously affected. A more than usual degree of anaemia may be present, and the body
weight may be sometimes lowered; but
the constitutional condition is rarely much
affected. The symptoms last a rule for
two or three months, but in extreme cases
may persist until the end of pregnancy.
I have occasionally also seen cases in which
regular morning sickness has been absent
in the early months, but has made its appear-
ance only after quickening. In a lady who
consulted me a few months ago, pregnant
with her sixth child there was distressing
morning sickness in the second and third
months, but in all her previous pregnancies
except the first she had been free from it
until toward the end of gestation, when it
recurred each morning and became most
distressing until terminated by her con-
finement.

In another class of cases the symptoms
are throughout severe, and may prove
actually fatal. They are the cases of persistent
or hercineus vomiting, and they are rare.
In my own experience they have occurred
in less than 1 per cent of the pregnancies
I have had under observation. Their chief
characteristic is that they are uncontrollable and that they produce extreme constitutional disturbance. The symptoms come on gradually, much as in ordinary instance of morning sickness; but often the commencement is early after conception. In any case a critical stage is very quickly reached. The patient becomes unable to retain food at all, suffers from incessant nausea and vomiting, and loses weight rapidly. Profound nervous irritability is often present, and I have indeed seen acute hyperosmoticis to light touch.

The abdomen becomes tender to pressure, and epigastric pain is present in many cases. The tongue is thickly furrowed, dry and cracked, and the breath is very foul. The pulse becomes small and rapid, sometimes "running" in character, and is usually greatly quickened. Arterial tension is diminished. Then is a profound degree of anaemia present, and signs of blood-disintegration may discern in the venous

M. excretion, to si purpurae extravasation. The temperature is subnormal at first, but as often happens in advanced anaemia, may
later become somewhat elevated. Profuse sweating may occur. The patient acquires from a most haggard, wasted appearance, recalling in many respects both typhoid fever and the meningeal condition. The superficial and deep reflexes are greatly increased, and in one case I have noted the so-called "tachycardia," distinctly present. It is rare known to find paralysis or atrophy of muscles.

The prognosis in the extreme form of the disease is always grave. Of 118 cases collected by Suenist, 46 died, and of the 72 that did not, 42 owed their recovery to the occurrence of abortion. In the majority of cases, if the pregnancy is not terminated and the symptoms continue unabated, the patient sinks into a typhoid state, low muttering delirium makes its appearance, the first sound of the heart becomes more and more faint and death supervenes from cardiac exhaustion. In cases where pregnancy has terminated before a fatal ...

(s) Playfair. Science & Practice of Midwifery. I. p. 234
result has ensued, the symptoms often disappear with marvellous rapidity, nutriment quickly re-establishes itself, and there is to all appearances perfect recovery. When improvement takes place during pregnancy, as sometimes, though rarely, happens, it is slower and more uncertain, and there is danger of relapse. The hopeful signs are a return of sleep undisturbed by nausea; a diminution of the sickness in the waking hours; ability to retain food; the presence of appetite, without sudden unnatural craving; the absence of premonitory distress; a lowering of the pulse rate and temperature; cessation of profuse sweating; and a return to the normal condition of all the excretions.

With regard to the Pathology of the Sickness, a number of different theories have been advanced. In the first place, it is evident that lesions which produce nausea and vomiting in non-pregnant women may also by coincidence be present in gravid women; as, for instance, cancer of the stomach; chronic gastritis; whether
goody, alcoholic, or caused by arterial sclerosis; gastric ulceration; nephritis in its various forms; brain tumors; hysteria; irritation of the stomach by the pathological condition of adjacent viscera; and acute yellow atrophy of the liver. (a) Of these conditions the latter has been by some considered to be dependent on the condition of pregnancy, and has been noted as having a possible causal relationship with vomiting; for "it has been shown by Lomer that Freireics that this disorder may affect pregnant women in forms of varying severity, and that the milder cases of acute yellow atrophy, in which death does not occur from complication, often show themselves through nausea and vomiting only." (b) It is difficult, however, to believe that acute yellow atrophy can be a common cause of the sickness, even in severe cases, for the condition, though undoubtedly more common in pregnant women than in other, (c) is still of the rarest occurrence.

(b) Ibid. loc. cit.
(c) Playfair, Sixteen Lectures on Midwifery I. p. 270.
and is generally met with as a sequel to jaundice, a condition rarely associated with nausea during pregnancy; and it is generally known that while vomiting occurs frequently in the early months only, acute yellowish skin increases pari passu with pregnancy, and not only fails to improve on the termination of pregnancy, but actually becomes worse, at the very time when the sickness, if it should even have lasted so long, ceases.

A view largely held today with regard to the sickness of pregnancy is that it is a nervous disorder, reflex in character, and that it is caused by sympathetic irritation transmitted from the growing uterus. It is supposed that the growing uterus, stretching the walls of the uterus, produces irritation of the contained nerves, and so sets up these reflex movements in the stomach that produce nausea. This theory accordingly represents sickness as merely one of the numerous reflex phenomena naturally accompanying pregnancy; and it is interesting to note that Playfair, who supports the view, alludes to the old observation: as Science & Practice of Midwifery, p. 162. I.
That where the sickness is entirely about its place is often taken by other more distressing sympathetic disturbances, such as asthma or cardiac syncope. This point has been further emphasized by Bedford, together with the fact that in such circumstances women are particularly prone to miscarriage.

Certain pathological conditions of the uterus have also been held responsible for the production of the reflex irritant causing the sickness of pregnancy. Henry Bennett believed that severe vomiting is always associated with congestion and inflammation of the cervix uteri; and more recently David has called attention to a case in which a connective tissue hyperplasia was present, together with a retention cyst of considerable size in the cervix, and was held to explain the origin of the irritation affecting the stomach.

Another theory of reflex irritation is that

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(2) Diseases of Woman and Child, p. 557.
advanced by Grailey Hewitt, who maintains that the sole cause of the sickness is to be found in flexions of the uteri producing irritation of the uterine nerves at the seat of flexion, & consequent sympathetic vomiting. This explanation of the condition is, according to Playfair, "sufficiently disproved by the fact that more or less nausea is a very common phenomenon in pregnancy," occurring in \( \frac{2}{3} \) of the cases, and that consequently it is "difficult to believe that two pregnant women out of three have a flexed uteri.

Quite recently an attempt has been made to identify persistent vomiting with toxic influences acting in the body; and it is noteworthy that evidence is not wanting from several authentic records on this point.

In 1892 W. Lindemann of Moscow made a most careful search in a case of persistent vomiting occurring during gestation. He found in the liver and kidneys those evidences of acute degenerative changes

(b) Playfair. *Serious Threatening Midwifery,* 1898. p. 162.
which an characteristic of toxic influences, while the spleen was enlarged, as has usually been found in other cases of the kind. Microscopical examination revealed neuritis of the phrenic, pneumogastric, mesenteric, and peroneal nerves, being especially well marked in the phrenic. The organs of the patient showed fatty degeneration of the liver and necrosis of the kidneys. Indeed, the patient's appearance suggested the presence, in the tissues examined, of a powerful toxin; and Lindemann came to the conclusion that there had been autointoxication.

A similar case of uncontrollable vomiting was investigated by Stenbock (a) in 1896; and here likewise were discovered signs of extensive poly-neuritis, due apparently to the influence of some toxic materia.

More recently still, Clifford Allbutt (b) has brought the pregnant state into connexion with the infection, and indicated persistent vomiting as due not to mere reflex excitability—which he describes as "superficial explanation, easily assigned"—but to the presence during

(a) Deutsche Medizinische Wochenschrift 1896, No. 27.
(b) Lancet, Feb. 27, 1897, p. 581.
gestation, of a circulating toxin. The fact that the symptoms are so marked in multi-
parae as in primiparae he ascribes to acquired immunity from the effects of the poison.

It is difficult, in the present state of our knowledge to estimate with precision the
accuracy or inaccuracy of the various theories just quoted. Reasons have already been given
for discarding the theory that an acute yellow
fever of the liver is, hence, the usual cause; and it has been shown that, in face of the
very frequent occurrence of sickness as a
symptom of pregnancy, it is not easy to
assign as its cause, a pathological uterine
state. Two explanations are, however, left:
one, that the condition arises from peripheral
irritation acting from the uterine muscles,
and producing reflex effects through the sym-
pathetic nervous system; the other, that it
is due to central or direct nervous irritation
excited by toxic substances circulating in the
body.

Both of these views have received considerable
support from different obstetricians in recent
years; the first named being perhaps the more
generally favoured. There can be no doubt that peripheral irritation is, in some cases at least, an important factor in the production of the symptoms. Its removal has, we know, in such a few instances alleviated, if not actually cured, them. The importance of this fact has been strongly urged by Grailey Hewitt in his interesting monograph on the vomiting; and although his theory is for obvious reasons untenable, there can be no doubt that the cases in which it has been tried afford remarkable instances of the effects of peripheral nerve irritation on the nervous system in pregnancy.

In some cases the cervical canal has been observed to be much stenosed, and the cervical tissue dense and resistant; and dilatation has been found to relieve the nervous irritation present.

The fact that vomiting is an early symptom of pregnancy appears to afford additional proof that reflex irritation is the cause of the sickness. In the later months the patient probably has got accustomed to irritation.

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(a) Grailey Hewitt. Seven Vomiting during Pregnancy. 1890.
The same immunity might occur in toxic cases; but toxic irritation would probably not be developed to an extent great enough to produce vomiting in the first month or two.

The occurrence of the sickness in the morning is difficult to explain; but I believe that the system is more susceptible to irritation of any kind in the morning, especially if the patient be anaemic. Melancholia and neurasthenia I have generally found exaggerated in the morning.

Possibly the want of food during sleeping hours is the cause of the pre disposed irritability; or it may be that the brain irritation has been in some way attended as the result of circulatory changes taking place during the same period.

As a matter the nervous irritability appears to be distinctly more defined in the morning, and this is quite noticeable in pregnant women. It may be a predisposing cause of the morning sickness. The movement of the patient on rising may also precipitate matters, either by enervating reflex impulses from the pelvis, or by exciting a sudden anaemia of the brain.

The act of vomiting tends to relax spasm
in other parts of the body. It may therefore be that spasm in the cervix uteri may be set up by the first movements; after awakennng, and the vomiting may result from it reflexly, and may itself, when often repeated, cause it.

Another argument in favour of the reflex origin of the condition is found in the improbability of toxic influence being much in force in the morning; for, not only is toxic excretion less in amount in the early months of gestation, but, according to Clifford Allbutt, it has been experimentally shown to be less in amount in the urine after sleep. The diminution in the morning refers, however, merely to excretion. In the system then may, in the morning, be a large quantity acting.

The fact that, when vomiting does not occur in pregnancy, there is a likelihood of asthmatic and syncopeal condition ensuing, is in support of the theory of reflex causation; and, finally, the fact that the disorder specially associated with toxæmia, such as eclampsia, rarely occurs till late in pregnancy, is against the explanation that

That vomiting is due to autotoxication.

Probably the cause of sickness in pregnancy is complex and associated reflex irritative, anaemia, impaired nerve irritation, toxic influences. In the ordinary sickness of the early months I think the reflex influences form the principal cause. In later vomiting and in persistent vomiting I should be inclined always to suspect as the chief factor, some toxic influence.

In a few cases it is necessary to exclude hysteria. I have cured one case at least of obstinate vomiting in the early months by a very free use of Asafoetida and Valerian.

The treatment of the sickness is not, however, always so simple, and some cases from most intractable.

Following the indications observed in the treatment of neurasthenia and allied states, in which the sufferers are generally found to be worse in the morning, I have generally given nourishment early in the morning, some hours before the regular breakfast hour; and I believe that the presence of food in the stomach upon the patient rises has an
ameliorative effect on the nausea. It is a good plan to get the patient to wake in the early hours of the morning, to sip a pleasant glass of milk and lime water, or even take a little bread and crockit; then, in the morning, immediately after she awakes, go breakfast, to administer a cupful of hot coffee, or keep her in bed for at least half an hour after. This plan is often very successful in curtailing the nausea, if vomiting does occur it is not so painful, unnecessary retching being apparently subdued. When the vomiting is frequent and annoying, teaspoonful of iced milk, with a little soda or lime water, are very beneficial; or, on the other hand, teaspoonful of very hot water may give most relief. Sparkling lemonade is strongly recommended by many observers. Often, however, the condition will only subside on the taking of some special article of food, if no other, - a further illustration of the neurotic character of the disorder, - and success will often be best attained by allowing the patient to take just what she wishes.

Should recours be had to drug treatment,
Many disappointment may be experienced before a suitable remedy is found; for few 
drugs suit at all, and what suits one 
will not suit another.

I have found most benefit from differing 
drugs, containing 3 or 4 minim of the 
diluted hydrocyanic acid, frequently repeated; 
or tincture of Mentha aromatica, given in 2 minim 
doses, repeated every half hour with a tea-
spoonful of very hot water; or the Vineum 
Aceticum, 2 or 3 drops doses every hour. In 
many all cases I give on scalding ginger, 
in the plan recommended by Dr. James Simpson, 
and have often found it to give relief.

Among other remedies in use are cocaine, 
menthol, pyroxyline, opium, chloral, bromide, 
and morphia, and in special cases one or 
or other of them may be found to be efficacious; 
but opiates should as a rule be avoided. The 
exttract of Cannabis India I have found 
useful in some cases, particularly when the 
sickness commences late in pregnancy.

Rest in bed is in every case important.

External applications; mustard, 6Mnigardine, 
lice to the spine, have been used sometimes with 
effect.
In all cases where the vomiting persists it is of the greatest importance that a vaginal examination be made, the state of the pelvic organs ascertained. Uterine displacement should be at once remedied, as also any pathological conditions of the cervix. In one case the only one of persistent vomiting in which I have met uterine displacement of any kind, I found the uterine retroflexed and pressed into the hollow of the sacrum. I reduced the displacement under ether, and there was no more vomiting. The patient won a good pressancy for two months, until the uterus had risen well above the brim, when there was no vomiting after its removal.

In cases where the uterus is anteflexed the Gavric air ball pressancy recommended by Henry is very useful.

In cervical inflammation painting of the cervix with a strong solution of iodine has been advocated by Armand Routh, and touching eroded parts with silver nitrate was a plan followed by Henry Bennett. In

236, Playfair. Edwin, Practice of gynaecology, I.
acute congestion of the cervix, Dr. Chay of Manchester was accustomed to employ bleeding.

In cases of subacute hypertrophic inflammation of the cervix, I introduced a glycerin
lithysol plug into the posterior fornix, but was forced to remove it in consequence of
threatened abortion. It produced a copious
decentration from the cervix, but there was no
diminution of the sickness.

In cases where the cervix is stenosed,

dilatation has been advocated by Copeman, but
is more practiced in America than in this
country. As in all cases where operative in-
terference has to be tried in the pelvis begin-
during pregnancy, there is great risk of abortion
happening after the operation. It should therefore
only be used as a last resort.

Sometimes, in persistent vomiting, nothing
is of avail except the emptying of the uterus.
In nearly all cases where this has had to
be done, it has apparently arrested the
sickness.

"British Medical Journal. May 15, 1876"
Ptysalism and Other Secretory Disorders.

Various derangements of secretion connected with sympathetic irritation, have been noticed during pregnancy. The saliva, the tears, and the sweat are among the secretions often remarkably increased. Of these the sweat secretion is the least often affected, but in poorly nourished and neuroasthenic cases, it is undoubtedly sometimes found to be in excess. The lacrimal secretion is sometimes exaggerated also, but is generally in cases of ptysalism that this is the case. A remarkable instance is reported by Neider. The tear secretion was here so abundant as to keep the eyes continually suffused and cause an eczematous eruption of the lids. The secretion was strongly alkaline, the eyes were normal, and no appreciable cause was found for the condition present. The patient was finally cured by the topical application of a 5 percent cocaine solution.

Ptysalism: Occasionally a most obdurate and distressing accompaniment of pregnancy; but the cases that are so severe

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(1) Davis, American Textbook of Obstetrics, p. 250. (cit.)
as to demand urgent treatment are very rare. The condition is usually met with in the first half of pregnancy, in women who are of nervous temperament. In a case under my care recently, there was also secondary syphilis, and the vomiting of pregnancy had been absent. The patient was in the sixth month of pregnancy when I first saw her, and the ptyalism, though not severe, was readily marked. No mercurial preparations of any kind had been taken since the commencement of pregnancy, and the ptyalism had only been present a few weeks. As was to be expected the general health condition was very poor. Pterygium sometimes persists until the termination of gestation in spite of all treatment, and the amount of the discharge is in some cases, as in one noted by Playfair, enormous, and calculated to cause considerable anxiety. If long continued and excessive, it produces a certain amount of anaemia and weakness. There is usually

[As Science and Practice of Midwifery: p. 740.]

no inflammation of the mouth. Like asthma, the condition has been found to be associated with menstruation as well as pregnancy. The cause would appear to lie in sympathetic irritation acting reflexly from the pelvis, and exaggerated irritability of nervous system from malnutrition, anaemia, and toxic states.

In Physiam there is no remedy that is of much effect. Tannin, tannate of potash and other astringents have been used as also ice and cocaine. Playfair mentions inhalation of turpentine and cresytes.

Systemically, a series of blisters may be applied just over the glands affected, beneath the jaw, or the surface may be painted with iodine; the idea being counterirritation. The continuous galvanic current has also been applied over the glands, sometimes with benefit.

Internally, tonic treatment gives the best hope of success, and should be pushed. There is no specific remedy. Quinine and the bromides are not of much use. Belladonna in large doses I have found to be the best remedy.
Spasmodic Cough:

Of the many sympathetic disorders accompanying pregnancy, spasmodic cough is one of the most common. It begins generally in the early months of continuance throughout gestation, and it is most common I think in primiparas. It is often very troublesome to the patient and on account of the frequency of phthisical exacerbation in pregnancy is looked upon often with suspicion by the physician. But examination of the chest will generally fail to find any lung lesion, if there is no symptom, no hectic, no increase of pulse rate. The cough in fact is essentially nervous in origin, it is caused by reflex influences from the uterus. In character it is dry and expiratory, often high pitched, and coming as a groan or sigh.

The attacks are increased by excitement.

The cough requires little treatment unless excessively distressing; but in any case it is soothing. Antispasmodic remedies are indicated, as for instance, belladonna or hydrocyanic acid; or belladonna or hydrocyanic acid may be combined with them. Pastilles of menthol or camphor, with or without a little morphia, I have sometimes found much appreciated; but probably much of the effect is due to the sucking, for I have seen unmedicated gelatine act nearly as well.
Asthma:

The occurrence of asthma during pregnancy is apparently quite rare. In my own practice I have counted less than 1 percent of instances in gravid women. In at least half of six undoubted cases there was a previous history of the disease. In two cases, there was evidence of hereditary influence, though the disease is not common in Cumberland. In only three instances was the asthma limited to pregnancy, and in one of these the disease was only apparent after the advent of labour. In all three cases, however, the symptoms were associated with the close rather than with the commencement of pregnancy, and I do not remember to have ever seen a well marked case in the early months. But according to Playfair it occurs then most frequently.

The occurrence of the disease in association with menstruation and other uterine conditions has been also noticed. In most cases predisposing causes are present.

(a) Science & Practice of Midwifery, Vol I, p.242
When the symptoms are associated with menstruation, there may be a monthly periodicity. Croom, writing in 1892, had noted two cases of asthma in which this periodicity was present. In one of these cases, the asthma ceased after cessation of menstruation.

Asthma has also been known to have some relationship with uterine fibroid disease and with ovarian disease, and Croom relates a case in which asthma disappeared after salpingo-oophorectomy for fibroid tumors of the uterus.

In two cases recorded by Hyde Salter,6 the influence of particular is particularly illustrated. A lady, aged 42, with several children, had had asthma since the age of 16, occasionally after marriage it disappeared, and had since returned only during labor, at each confinement.

In another case, that of a lady aged 40, with four children, asthma made its appearance at every confinement and

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(b) Salters. Asthma, its Pathology and Treatment 1868.
at no other time, until she had reached
the age of 37, when it became more frequent.

A case of even greater interest, so far as
the relationship of asthma to pregnancy
is concerned, is that recorded by Croom in
[1]. In this case asthma appeared soon
after conception, "was co-extensive with preg-
nancy, and ceased at once when abortion
took place." The attacks started when
menstruation was first missed; they
generally occurred at bedtime; and there
were several of them in the first two
months. They became rapidly worse
towards the end of that time, and in one
of them the patient aborted. Then no
more attacks occurred, and the patient
made a good recovery.

The interesting points, Croom thinks,
about this case are, firstly, that the
asthma occurred originally at the time
of the first menstrual suppression, and
in this respect resembles morning sickness;
secondly, that morning sickness was absent.

Thirdly, that instead of occurring at one
or two o'clock in the morning, as asthma
generally does, it occurred immediately after
the patient had gone to bed, and so more
resembled a case of cardiac asthma.
Fourthly, that it was so severe as to occasion
miscarriage. It is noteworthy too that
there was no family history of asthma.
The patient was, however, pregnant under
distressing circumstances, and was of
a highly nervous temperament.

The absence of vomiting in this case
calls to mind the argument of Bedford,\(^a\)
that, when morning sickness is absent,
other sympathetic disorders, and notably
asthma, are often present, and the
patient is peculiarly liable to abort.

With regard to the causation of asthma
in pregnancy, the prevailing view is that
it is a spasmatic condition of the bronchial
muscles due to reflex irritation from the
uterus. Goodhart & others have termed

\(^a\) Diseases of Women and Children p. 551.
\(^b\) British Medical Journal 1871. vol. xi p. 254.
it a "paroxysmal neurosis"; and certainly there appears to be no doubt that, essentially, it is a nervous disease. But whether it is due alone to spasmodic contraction of the bronchial muscle is very doubtful. The dyspnoea, though mostly expiratory, is also inspiratory, and comes on with great suddenness and as quickly subsides; and in many ways the disease suggests spasm. But there is strong evidence that there is also some hyperaemic or even inflammatory condition of the bronchial mucosa, acting in combination with the spasm.

The occurrence of the disease in the pregnant patient helps us little in the elucidation of the pathological process immediately preceding or occasioning the paroxysm; but it serves to accentuate somewhat the "neurosis" aspect of the disease.

As regards the theory, advanced by Haig and his supporters, that asthma in pregnancy is due to the presence of excess of uric acid, in the blood, there is little evidence of a very
substantial character in favour of it. The conditions of uric acid excretion and of
deviant blood pressure which it assumes are not yet precisely calculable, but clinically
the association of asthma and uric acidemia, especially in pregnancy, is not very apparent.
The toxic causation of asthma during
gestation is, however, not improbable, and in
view of the high toxic acid level existing
in gravid women it is as well to keep this
in mind.

The prognosis in Asthma of Pregnancy
is not grave. I believe death during the
attack is unknown. But the risk to the
foetus is considerable, as miscarriage is
not infrequently happens if the attacks are
severe. In one of my own cases the gestation
terminated in the eighth month during
an attack. The labour was rapid and
the child was stillborn. There was no
albuminuria in the patient.

The Treatment of Asthma during
pregnancy differs in no particular from
that pursued in ordinary cases. In the non
pregnant, I have used belladonna, for
belica and stramonium with good effect, also the Kastins preparations and De Toy's cigarettes. In acute cases, I have given morphine hypodermically with the best results, but the effect requires to be carefully watched, as the drug may be easily pushed to a harmful extent. The iodide, nitrate of silver, and bicarbonate of potash are also indicated, but I have never seen them do any good. Nitrite of amyl is known sometimes serviceable, and during labours I have seen a few whiffs of chloroform vapour have a marvellous effect. The administration of chloroform to an asthmatic is however undoubtedly dangerous, and as death does not specially threaten in asthma gravidarum there is no need to invite it by the unnecessary exhibition of a dangerous drug.

In recurrent asthma I think the diet of the track condition should be carefully regulated and the urine should always be examined for albumen. If this is present the renal condition should be treated.
Neuralgia:

If we set aside the cases of neuralgia due to direct and organic pressure on the nerve trunks affected, and limit the term "neuralgia" to cases of pure functionnal disturbance, we find that true neuralgia is by no means a common disorder of pregnancy. The pathology of the condition is obscure; but there is much evidence to favor the theory advanced by Jones, that it arises from central cause, producing disturbance of function in the nerve cells governing the nerve tract concerned. It occurs most frequently in the early months of pregnancy, or in women of sensitive nervous disposition or neurotic heredity. The exciting cause is almost invariably nutritional disturbance, and that from a variety of causes. When the patient is depressed in spirits, weakened by vomiting, or deficiency of food, unusually anaemic, or subject to any of the numerous and well recognized toxic conditions which impair vitality and appear to exercise an effect specially injurious on nerve function, there
We may find neuralgia complications arising in pregnancy. Too much stress cannot be laid on toxemias, as great is the effect they have on the nutritive processes of the body. They comprise both auto-intoxicating and the toxic states induced by outside or added factors. The former have already been noted in connection with the blood state (page 14), and of the latter the two which act most often are alcoholism and malaria. I have seen neuralgia undoubtedly excited in this intermittenly by indulgence in alcohol, and in at least one case, that of a lady who had resided for a few months on the Gold Coast and had had malaria fever there, I have seen acute neuralgia develop in her pregnancy after her return to Cumberland, to be accompanied by an inter-mittent fever, only to be controlled by the steady exhibition of quinine.

Other causes influential in the production of neuralgia lead poisoning and diabetes are well known; but the extent to which these causes induce the disorder during pregnancy is necessarily limited, and Ian
and aware that, in any case I have seen in which sugar has been present in the urine during pregnancy, there has been neuralgia.

As in ordinary circumstances, exposure to cold may induce neuralgia during pregnancy; as also may any reflex irritation such as that produced by decay of the teeth. Neuralgia of the 5th nerve is sometimes very severe in the early months of pregnancy. It is sometimes purely neuralgia, and in such cases Playfair recommends the employment of large doses of quinine; but in other cases it takes the form rather of toothache or profuse, due to actual caries of the teeth. In fact, so common is it for the teeth to be the direct source of the pain that in every case of facial neuralgia it is recommended that the mouth should be examined and the condition of the teeth carefully treated. In pregnancy there is a tendency to tooth caries, due, as Oakley Coles (a) thinks, to the presence of acid dyspepsia and of acid secretion acting on the teeth. Hence the treatment of the mouth during

(a) Playfair, Seccina & Pract. of Midwif., I.p. 241.

(cit. Oakley Coles, Trans. Odont. Society.)
Pregnancy is of great importance in any case where signs of progressive tooth decay make themselves evident. The teeth can be antisceptically treated or "stopped" when the decay is slight; and even when it is advanced, if extraction is the only remedy, there is no reason why the operation, if care-fully performed under chloroform, should give rise to any bad results. I have on one or two occasions seen several teeth removed under such circumstances, than have not ob- served any bad effect.

Separate from the pure neuralgia of pregnancy one must class never pain due to actual or organic pressure on the nerve trunk itself. In some cases there is set up in the lower extremity a condition closely resembling true neuralgia, but dependent on actual pressure on the pelvic and sacral nerves. This is caused in some cases by pressure of impacted faecal deposits in the rectum, in others by pressure of an enlarged and sometimes displaced uterus. The pain, is often, in such instance, of a persistent aching type, and is referred
principally to the obturator or sciatic nerve areas; but often it is lancinating in character, and radiates downward even to below the knee. In many cases, the condition, unless due to irreducible displacement of the pelvic organs can easily be remedied; a reposition of the uterus or complete removal of impacted matter from the bowel by copious enemata being generally all that is required. In nearly all cases the pain is arising from pressure on the nerve trunk concerned; but in some cases it is possible that there may be a reflex element present similar to that met with in neuralgia of the sixth nerve; or the condition will be found to depend upon anaemia, depressing cause affecting the nervous system, or malarial or other toxic agencies.

The treatment of neuralgia occurring during pregnancy is often difficult; for the condition has a great tendency to persist. The patient should always be placed in the best condition as regard fresh air, nourishment and personal hygiene. Anaemia should be steadily combatted by the administration of small
closes, frequently repeated, of iron and arsenic, the latter drug especially when a malarial element is present. Quinine is also of value, and may be used either for its tonic or analgesic effect. Alcohol also is often of the greatest value, most wine being probably the form most suitable.

For direct analgesic effect in acute cases, phenacetin, alone or in combination with caffeine, is often of service, as also antipyrin, acetanilide. The bromide, with chloral, can be given in large doses; and in severe cases morphine may be used. But tonics rather than narcotics should be relied upon for the more lasting benefit.

In all cases of pelvic neuralgia which is persistent a vaginal examination should be made and any abnormally ni.

The position or condition of the uterus and its appendages should be rectified. If there is any accumulation of retained fecal matter in the rectum, enemata should be given and the retained matter removed. The bowel should throughout be kept in a clean and healthy condition, so that
The risk of toxic absorption may be mini-
mized as much as possible. In psychic neuralgia,
where no apparent cause exists, a sector
supporting containing 10 grains of Phen-
acetin has been recommended.a

In cases of facial or even of cranial
neuralgia the condition of the teeth should
be investigated, as already pointed out.
In facial neuralgia the upper teeth are
most often at fault; in cranial neuralgia
the lower. Severe is almost invariably
derived from the lower. In any case, if
caries, stumps, or cavities can be identified with
the distribution of pain complained of, they
should be removed. Local anesthesia can
be induced by cocaine or the chloride of
ethyl, so that there is little risk of nervous
shock attending the extraction. Even in
cases where there is extensive tooth decay,
where several stumps require to be drawn,
care must be exercised to prevent and the operation
done exactly as in non-pregnant patients.
I have never any harm from it.


Headache:

Severe headache is by no means an uncommon accompaniment of pregnancy. I believe few grand women reach the end of their pregnancy without experiencing it at some time or other in more or less intensity—an intensity out of proportion to that experienced by them when not pregnant. The headache may be frontal, vertex or occipital; uni-or bilateral. They may be constant or transient; due to cause, either central or peripheral. The anaemic condition in pregnancy, the nervous excitability, the altered conditions of blood pressure, the nutritional changes, the increased peripheral irritations, the toxæmic state—are all predisposing causes; and in pregnant women, disorders of gastric and intestinal function, albuminuria, insomniæ and mental states are especially to be kept in view in diagnosing causation.

Hemicrania:—It is not uncommon for the pain to be confined to one side of the head, and the condition then goes by the name of hemicrania. This form has been associated in pregnancy with reflex irritation from the uterus and gastric intestinal tract, and with central irritation.
irritation from toxic substances circulating in the blood, and with alterations of blood pressure within the cranium. Haig and others associate the attacks with uricacidemia, and there is no doubt that just prior to and during the attacks the output of uric acid is diminished. The observers have shown the influence of cystostani. The attacks are gravesome and often last a day or two. Recurrence is frequent, and these may be marked periodically in the attacks. The symptoms are not especially different from those found in ordinary cases in the non-pregnant, but if anything they are more acute.

The treatment, having regard to the condition prevailing during pregnancy, consists in an amelioration of all nutritive deficiencies, the prevention of an imperfect blood condition, the correction of gastric and intestinal disorders and the most careful regulation of the alimentaries. The diet should be light and non-stimulating, and should be moderate in amount. The patient should have abundance of fresh air and regular exercise. The room should be kept well aired.
and all the conditions of personal hygiene attended too. Statis producing unnatural reflex irritation, such as eye strain, uterine disorder, should be treated when present.

During the attacks, the bromides, citrati of caffeine, phenacetin, tinctura of guarana, and carminic indica are among the remedies I have generally tried and sometimes seen benefit from. A good combination is that of caffeine, citrati 2 grs., with phenacetin, 8 grs., repeated every three hours. Antipyrin and antipyrin are also useful, and in pregnancy cardiac depression is not so likely to arise from their action as it is in the non-pregnant.

In nearly all cases the first requirement is a thorough evacuation of the bowel.

**Insomnia:**

Want of sleep is a condition occasionally complained of in the course of gestation. I have generally found it most complained of in the later months, when it appears to be due to a condition of raised blood pressure in the brain acting in conjunction with nervous irritability. The result is reflex disturbance.
or of toxic material circulating in the brain. But frequently also it occurs in the early months and is sometimes associated then with exhaustion from severe vomiting, anaemia, or other conditions of malnutrition. It may in some instances be accompanied by severe neuralgia or headache.

When present it produces often great misery, depression of spirit and irritability of temper, as well as physical debility, and its treatment is very important. It is sometimes a danger signal of grave mental and nervous breakdown.

Its treatment will vary according to the general conditions accompanying it, or underlying it. If the patient is anaemic or neurasthenic, the prolonged administration in small doses frequently repeated, of iron and arsenic, and improved feeding, are very desirable. A good meal of some easily digested non-stomachic foods at bedtime is sometimes particularly bene-

"ficial, and milk may sometimes be given during the night with good effect. A moderate dose of bromide of potassium
at bedtime will often be also of great assistance. The bowels should be kept open very regularly, and during the day the patient should have plenty of fresh air, cheerful surroundings, and a proper amount of exercise.

In cases where the general blood pressure is high, as so often happens in the latter month of pregnancy, it is sometimes difficult to control insomnia. Drugs often have but little effect, if at best give only temporary relief, and one is reluctant to push them sometimes out of fear that the patient may acquire a dangerous habit thereby. Chloral however is often of great service, especially in combination with bromides; and I think also that trional in doses of from 10 to 15 grains is sometimes of value. Cannabis indica is very beneficial in a few cases, but is not very reliable.

A great of good may be gained in cases of high blood pressure arising from the employment of saline cathartics & diuretics, and if the bowel an opened towards bedtime sleep will sometimes follow. In one of my cases phenacetin & similar compounds were successfully given in conjunction with this treatment, & the results were satisfactory.
The Mental Condition in Pregnancy:

There is inevitably a psychology of pregnancy. In a great majority of women with child an alteration in the mental condition is well marked; not very extreme perhaps, but still quite remarkable. Most usually the alteration is very similar to that which shows itself in many cases in non-pregnant women of neurasthenia, and which expresses itself in intensified emotional susceptibility, fretfulness, irritability, and at times depression of spirits. More rarely, the moral sense, will power, memory and the reasoning powers are affected; there is great deficiency in inhibiting power; the patient becomes acutely impressionable; there is great caprice of temper; and the most curious likes and dislikes are developed. The most amiable woman may become moody, fretful and unreasonable; and there may be a condition bordering on melancholia. It is rare to find dementia of any type, but some cases show excitant mental states even to the extent of actual mania.

It is however seldom that the mind is
quite deranged in the course of pregnancy. In fact, Cleworth has recorded his opinion that "there is no period in the life of a woman after the age of 25, when she is less liable to actual insanity than during her pregnancy."

Between the years 1874 and 1882 of the total cases treated at the Royal Edinburgh Asylum, only 1 per cent were cases of insanity occurring in pregnancy. These cases were by no means of a uniform type, more than half of them being of a maniacal type, and the rest melancholic. The proportion of melancholic is known much greater outside of asylums, for a number of cases receive treatment at home.

Insanity of any form is more liable to occur in first than in subsequent pregnancies, is rare in the early months, and is most common after the sixth month. There is a greater tendency to it if the patient be advanced in life when she becomes pregnant, and, among predisposing causes, there

(a). Cleworth, Mental Disease, p. 558
(b). Ibid. p. 555.
may be noted heredity, the neurotic temperament, previously existing neuraxes, mental shock, alcoholism & toxæmic conditions.\(^2\)

Hereditary taint plays an important part, as in most forms of mental disease; and was present in 12 out of 28 cases of the insanity of pregnancy collected by Tuke from the statistics of the Schirburgs Royal Asylum. \(^3\) Furstenau\(^4\) traced it in 9 out of 32 cases; in 11 other cases out of the latter number he found a family history of epilepsy, drunkenness and hysteria. Studies of mental appeasement & of moral reaction have also been cited as predisposing to insanity during pregnancy, and may explain the greater frequency of the disease in women who are unhappy in their married life or who are pregnant outside of wedlock. Toxæmic appears sometimes to invite the onset of the disease condition. From its irritative effects on the cerebral centres; and in some cases of

\(^{a}\) American Textbook of Obstetrics p. 222.

\(^{b}\) Schirburgs Medical Journal. Sept.

\(^{c}\) Archiv. F. Psychiatr. Bd. 3. Ueff 2.
has been observed to produce delusions and hallucinations. In this connection it is interesting to recall the various theories of the production of mental insanity after labor by toxins absorbed from the genital tract.

The most of mental derangement during pregnancy is generally gradual; and the disease generally assumes the form of melancholia. There is usually no pronounced stupor. A certain amount of neuasthenia is often present, and the initial symptoms are often no more than those incident to a condition of neuasthenia. But the depressing of spirit, irritability, emotional susceptibility, the marked dislike and distaste, the caprice of temper, the egotism, selfishness, morbid introspection and the hypochondriacal tendencies assume a character distinctly pathognomonic, and deepen not merely into melancholy, but into a well marked and genuine melancholia. Suicide impulses are not uncommon. There is a loss of interest in environment, a disinclination for

(a) American textbook of Obstetrics. p. 222.
Social life, an alienation of affection often for her husband, and a nearly always present impression, a fear of some impending disaster or of death at confinement. Sleep disturbance are very common; the patient feels unrested and often distinctly worse in the morning, and there is sometimes loss of weight.

Moral perversion is common, a disposition to lying and stealing, and to alcoholic indulgence, being often remarked. Forbe especially has called attention to the occurrence of dipsomania in the early months. In one case under my own notice there was a monthly periodicity in the alcoholic intemperance, the attacks taking place at about the times when, if pregnancy had not occurred, the menstrual flow would have marked its appearance; and the patient, a primipara, was quite cured of the indulgence on termination of her pregnancy, though previously to it she had been accustomed to take alcohol, often to excess, at such succeeding menstruation.

The occurrence of well-defined "kleptomania" has been mentioned by Laying as characteristic
of the insanity of pregnancy, and Playfair directs attention to a curious case recorded in Caster's work on Forensic Medicine. When "this occurred in a pregnant lady of rank, the influence of pregnancy in developing an irresistible tendency, was pleaded in a criminal trial in which one of her petty thefts had involved her."

Periods of remission may occur in the melancholic condition, and the disease may from time to time exhibit a change in type. There may be dementia or stupor, though these are rare; or there may be outbursts of maniacal excitement. A condition of true mania is not uncommon, transitory or chronic, of the simple variety, or complicated by delusion, hallucination, delirium, and a variety of functional aberrations. Insanities of other forms may be present as complications in the insanity of gestation, and the disease may be attended with symptoms characteristic of different forms of functional nervous disease. Hysteria, epilepsy, cholera,

(a) "Science & Practice of Midwifery" II. p.336.
(b) "New Sydenham Society Public" Vol IV. p.308.
hysterophobia, hypochondriasis, neurasthenia have each modifying effects on the type of mental disease, whenever they are concurrent with it. It will be apparent then that in each individual case there are often many factors indissolubly associated, the patient’s breakdown being the resultant of several complex conditions, each reaching when and intensifying the others." (c)

The prognosis in the insanity of pregnancy is guided necessarily largely by the character of the underlying or causal condition; but, it is, on the whole, favourable. Out of 28 cases, 19 recovered in six months, and Cleston reckons the total recovery at over 70 per cent. In Menzies’ case, the recovery numbered only 43.3 per cent. (c) The percentage is higher with melancholia than with mania; but even then it is below that obtained in the insanities which occur after labour, though in latter are much more frequently of the manic-depressivety. The duration of the disease

(a) American Textbook of Medicine, p. 216.
(b) Mental Disease, Cleston, p. 559.
(c) American Textbook of Medicine, p. 799.
is longer in the case of melancholia; and it is rare to find the symptoms cured before
the termination of pregnancy. In only two out of 19 cases recorded by Marché did the in-
sanity disappear before confinement. (2)

Delirium would therefore appear to accelerate a cessation of the symptoms; according to
Clouston in 60 percent of the cases. (6) But in a few instances the disease is rendered worse,
and in 3 out of 15 cases noted by Clouston it was only after confinement that the symptoms
became so severe as to require asylum treatment.

The treatment of mental disease in
pregnancy varies, like the prognosis, ac-

cording to the condition underlying or
exciting; but otherwise is in no way special.

Much depends on the physical condition of
the way in which the brain again discharges
its function. Conditions of malnutrition
and of neurasthenia should be carefully
investigated, with a view to the correction of

nutritional defect, and too much attention cannot be paid to the feeding. Speaking generally, in all cases when an intense nervous element prevails the risk in pregnancy will more exaggerated, and especially when it expresses itself in hysteria, neurasthenia, or other definitely functional diseases, the feeding should be very rigorous, and should be carefully regulated; these should be complete mental rest, and, when the physical condition is low, bodily rest also; the social surrounding should, in the absence of special necessity for seclusion, be cheerful; and in all cases a specially selected attendant should be provided, whose sole duty will be the careful nursing and watching of the case. The tendency to suicide must also be kept in mind.

Drug treatment is not infrequently called for, and in certain conditions proves of great service. In women whose mental derangement is associated with any toxæmic condition it is very important to get rid of the poison, circulating in the blood, as quickly as possible, and therefore
Stimulants of the excretory system through the bowels, their kidneys must be induced. Narcotics and sedatives, and especially opium, should in such cases be avoided, where there is insomnia a copious evacuation of the bowels at bedtime assisted by a moderate diuretic medication will produce sleep often better than anything else.

In the neurasthenic melancholia a full meal at bedtime of some light non-nitrogenous substances is often a very good sleep producer, it being nutrition that is called for, not narcotism. The same may be said too of cases complicated with alcoholism. But in insanity of the maniacal type, especially when the result of shock or when very acute and complicated with violent delirium, the free use of narcotics for a time is often indicated.

In any case however it may be said that in mental conditions during pregnancy sedatives and narcotics should be given in as small doses and as seldom as possible.\(^{(a)}\)

\(^{(a)}\) Cleveston. Mental Disease. p. 560.