A Thesis

On the Condition of the Nervous System in Pregnancy:

Its Functional Diseases and their Treatment.

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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 nutritional requirements; and though they show, as might be expected, great variation in different subjects, according as the different systems respond to the strain imposed on them, they are an essential accompaniment of pregnancy, & are observable in all instances of the condition.

And it is not surprising that this should be the case, for pregnancy "means a dynamical change for the time being in the direction of some of the great currents of energy, & a change amongst others in the quality of the blood." * The nutritional requirements of the organism are altered & increased, and metabolism arranges itself upon a new basis, & conducts itself

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* Mental Diseases. Clouston. p. 5-5-5-

along fresh lines, amid new dangers, & with a double objective. It is therefore evident that important effects must result in the various systems from the new conditions imposed upon the organism.

In the nervous system quite a number of changes are observable, most of a purely functional character, though varying in different cases in intensity. They appear 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 fulfilling 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

† Mental Disease - Clouston. p. 555.

phenomena than 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 colored corpuscles, though there is at the same time a material increase of leucocytes, fibrin, & extractive matter. The condition is therefore normally one of hydraemia, anaemia, & hyperinosis; and Cazeaux, whose researches have done so much to increase our knowledge of the blood changes in pregnancy, thinks that "the pregnant state is essentially analogous to Chlorosis." In the case of most women this is no doubt correct; for the great tissue drain during pregnancy & the often unfavourable conditions in which nourishment & hygiene have to be maintained, tend undoubtedly to the production of an anaemia of this type. But Willcocks has shown*

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* Lancet. Dec 3. 1881.

That though 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 poorer in this substance, as they are in chlorosis. Much depends however on the period of pregnancy at which the estimation is made, for Fehling* in 1886, & Meyer† in the following year, have drawn attention to the fact that though both the red corpuscles & the haemoglobin percentage are in some measure diminished during the early months of pregnancy, in the later months there is a decided increase in the proportion of both; and Dudner‡ also found that so soon as the balance of nutrition becomes established, a steady increase in the haemoglobin & in 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 merely quantitative.

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* Fehling. Verhandlungen der Deutschen Gesellschaft. Gyn. 1886.
† Meyer. Archiv. f. Gynäkologie. 1887. Bd 31 H 1.
‡ Dudner. Munchener medicinische Wochenschrift 1890. No 31 & 32.

It is significant that in normal pregnancy, even when the blood condition is at its best, there is always the deficiency in the corpuscular number of red cells. In spite of the evident effort of nature to effect an increase in this number, the blood remains diluted 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 early womanhood especially, its frequency 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 cortical irritation, hemalgia, hemicrania, neurasthenia,

insomnia, & other functional disorders, exist quite frequently during pregnancy, and there are grounds for believing that many symptoms of functional nervous disease occurring in that condition are associated with impoverishment of the blood supplied to the nerve centres. Meynert[a] believes that the melancholia sometimes present in pregnancy is the result of an anaemic condition of the cerebral cortex, and we know that chorea, hystenia, neuralgia, 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 per se from those due to causes underlying & accompanying the anaemia, and it is not possible on clinical grounds alone to say what nervous symptoms, or what degrees of any one symptom, are due entirely to mere deficiency of blood circulating in the nerve centres. Writing of Spinal anaemia,

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(a) New York Medical Journal. May 1891. pag 497.

Osler[6] states that there may be extreme grades of anaemia of the cord without symptoms, & that spinal symptoms are not often present either in chlorosis or pernicious anaemia: and even when observed he thinks that clinically they are in no way characteristic. But he admits the possibility of important changes taking place in nerve elements after great haemorhage; and every Obstetrician knows that after severe uterine haemorhage, or other great blood loss the symptoms of brain & spinal anaemia are often present in marked degree. I have seen the knee jerks greatly exaggerated after severe post-partum haemorhage, and have indeed found substantial evidence not only of increased spinal irritability, but also of increased cerebral excitability.

Admitting therefore the increase in nerve excitability after great blood loss, it is rational to assume that every considerable anaemia will have its effects on the nervous system: and in a condition such as pregnancy,

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6) Osler. Principles & Practice of Medicine page 966.

where heightened reflex susceptibility is more or less always present, and where a state of blood dilution is coexistent, it is logical to associate the conditions to some extent, and to expect that an excess of the anaemia will be followed by still more marked nervous changes.

Now 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 psychological 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 result of the normal anaemia of pregnancy. So great however 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 & ovum. If we allow however for the weight of the latter & 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 hydraemic condition of the blood. The excess of water produces increased intravascular tension, abundant renal osmosis, more rapid breathing, more breaking down of proteids 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 impaired nutrition, depends also largely on the efficiency of the proteid element & on the improved ratio of iron & fat present, for we know that if the blood be impoverished in proteids, iron & 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 & 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 of the nervous system is threatening, & 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 preparedness of the system in this respect is always to be

favorably interpreted. It implies the existence of that reserve of nutriment which is the best proof of a well organized gestation.

Influence of Blood Pressure: But it is not only the nutritional quality of the blood that is concerned in the proper working of the nervous system in pregnancy. Much depends also on the state of blood pressure.

T. 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 illusory sphygmographs." 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 interpolation of the foetal circulation, or to mere increase in the total mass of blood, there can be no doubt that is commonly present, & that it is physiological. By some observers it is believed to be due to obstruction in

the capillaries, and directly proportional to the amount of uric acid circulating in the blood.[a] But this theory is I think discredited by the fact that in normal pregnancy there is a steady upward progression of nutrition & metabolism with a rise of urea & a fall in blood alkalinity, in consequence of which the blood is cleared and kept clear of uric acid. Obviously then the theory of uricacidaemia 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 basic tissues will share the deficiency, and a number of functional perversions, expressed perhaps by mental depression or increase of irritability, may be produced.

Abnormal rise in blood pressure during gestation may also produce symptoms pure

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a) Alex. Haig. Uric acid in Causation of Disease. p. 249.

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, & perhaps also some increase in the amount of cerebrospinal fluid, so that the cerebral circulation is interfered with and nervous action perverted. Several head symptoms occurring in pregnant women, as for example cephalalgia, hemicrania, and insomnia, are capable of explanation on this hypothesis.

Regressive Metabolism and Toxaemia in Pregnancy:

As a result of the increased nutritional changes occurring during pregnancy, there is increased formation of waste products. Effete matters from both the maternal & foetal organisms pervade the blood, and require to be eliminated. Their retention in the blood through any failure of the renal and other excretory organs

to discharge their functions properly, is a frequent danger in pregnancy, for they not only by their continued presence hinder metabolism & nutrition, but they exert often an active absolutely poisonous. It is notable too that they expend their toxic power largely upon the nervous system, particularly when this system is highly developed or specially excitable. Hence, in pregnancy, their effects become the more dangerous.

Still a number of substances formed in the regressive metabolism of pregnancy have been credited with the production of abnormal nerve 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[a], Hermann and others been associated with nerve irritability, and the development of Eclampsia. We know too that creatin & creatinin are

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[a] American Journal of Medical Sciences Feb. 1894. p. 147.

The substances held responsible by Dührssen[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 sets up headache, fits, mental depression, asthma and other morbid states during pregnancy.

But it is neither the accumulation of nitrogenous waste nor yet, as some have thought, a surplus of potassium combinations or of unexcreted colouring matters that renders the toxaemic condition in pregnancy so intense and so apt to produce disordered states of the nervous system. The recent researches of Feltz & Ritter[c], Bouchard & others contain 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) "Urémie Expérimentale" 1881.

According to Chambrelent[a] the toxic coefficient of the urine in normal cases of pregnancy falls, on delivery, almost at once from 0·46 to 0·25. Blanc[b] injected 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 ex-periments of Tarnier & Chambrelent;[c] & Rese observed has 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 microbic. Probably it belongs to the class of animal alkaloids or toxins.[d] Clifford

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(a) La Semaine Medicale No 10. 1892.
(b) Lyons Medical No 38. 1890.
(c) Annales de Gynécologie. November 1892.
(d) American Textbook of Obstetrics. p. 203.

Allbutt[a] believes it to be a toxin, possibly composite, derived from the bowel, "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. Lensden[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 kidneys and liver have, post mortem, been found deeply congested, with, sometimes, evidence of extensive degenerative changes. The spleen is enlarged and the blood condition greatly altered. The nervous system is also profoundly affected. Neuritis is often general, and functional disorders are frequent. Clifford Allbutt[c] attributes to toxic action the severe headaches, neuralgia, & nervous

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(a) Allbutt. Lancet Feb. 27. 1897.
(b) Lensden. Virchows Archiv. Bd. 142.
(c) Allbutt. Op. cit.

excitability of pregnancy; also the chorea, insanity, persistent vomiting, tetany, dyspnoea, & eclampsy 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 toxaemia in multiparae, but to immunity gained against the action of the poison.

Eclampsia:

In close relation to the toxaemic 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 conditions specially associated with pregnancy.

It is by no means a common disease. The proportion of gravid women attacked has been variously estimated; by Aveard as 3 in 1000; by Martin & Kaltenbach 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 primi-
-parae. 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 Herman[a] nine began before labour, two
during, and one after labour. But Goldberg[b]
found in a series of 1120 cases, 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
occurs at the close of pregnancy, but before
labour. The differences both 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 eclamptic attacks
generally come on before the termination of pregnancy.

Eclampsia is more frequent in first

(a) Trans. Obst. Soc. Lond: vol. 33. 1892.
(b) Centralblatt fur Gynäkologie. 1891.
(c) American Textbook of Obstetrics p. 624 cit.

pregnancies, and if the primipara be old the liability is increased. According to Olshausen the disease also occurs more frequently in twin pregnancies; and tedious & difficult labours appear also to invite it. Heredity has rarely been found to be a cause, but Kaltenbach 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 labour 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 labour followed immediately upon a vaginal examination.

In its onset eclampsia, as its name implies, is very sudden; but usually there are premonitory signs however slight. Among these may be noted headache, dimness of vision, dizziness, specks before the eyes, & absence of mind; or more rarely irritable-ness, vomiting, epigastric pain: and occasionally a well marked aura has been ob-

-served. Sometimes too there is oedema of the hands and face, and when this is noticed in conjunction with the other warning symptoms, an attack may be expected at any time.

The attack itself is essentially similar in character to the haut mal of 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 reestablished. The coma which follows is generally deep + lasts often for twenty or thirty minutes. Consciousness may then return; but when there are 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" persumptively for more than twenty four hours. A diminution in frequency is justly 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 excitation almost certainly brings on labour, and delivery may be rapid. In a large proportion of cases the child is still-born; or if alive, it may likely be eclamptic. According to Playfair [a] there is good reason to assume that the eclamptic condition is partaken of by the child in utero.

Eclampsia is sometimes arrested and pregnancy completed if the foetus dies before the onset of labour [b]; 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 & Practice of Midwifery Vol II. p. 325.

(b) American Textbook of Obstetrics - p. 627.

In 1885 Barker[a] found it to be 32 per cent in cases occurring during pregnancy, but more recent statistics place it, at the present day, below 20 per cent. 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 congestion. In others cases it has been due to cerebral apoplexy, pneumonia, acute yellow atrophy of liver, ~~and~~ or septic poisoning. And finally, the toxaemic condition regardless of complications or consequences of the eclampsia, may be itself in some cases the cause of death.[b]

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 insanity. Hemiplegia has been noted in a few cases, and is usually permanent. In one of my own cases labyrinthine deafness, a sequela which I

(a) Barker. The Puerperal Diseases p. 125

(b) American Textbook of Obstetrics. p. 628.

find no published record, was found to be present after an attack.

With regard to the Pathology of Eclampsia, a great many theories has 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 excretion of pregnant women one or more toxic substances, when retention, from whatever cause, in the maternal organism is accompanied by certain well marked symptoms of poisoning; and it is thought that an undue retention of these substances is the cause of eclampsia. For it has been found by experiment that in eclamptics 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 excretion, is not known; but it has been shown by Massien[a] & others that the kidney condition is more or less

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a) De la Toxicité de la Sérum.
Thèse de Bordeaux. 1893.

pathological in all cases where the toxicity of the blood serum is increased. This condition is no 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 not in itself the essential cause of eclampsia. The toxaemia, indeed, "though usually associated with renal failure and dependent upon it, does not in all cases have such association & dependence, for the disease caused by the toxaemia 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, & that it may properly be identified with some state of autointoxication.

(a) American Textbook of Obstetrics. p. 632.

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

Now even admitting the theory of a cumulative toxaemia as the explanation of eclampsia, the pathogenesis is still far from clear. For assuming that the toxaemia is much more profound in some patients than in others, and produces often grave irritative effects on the organism quite early in the 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

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(a) American textbook of Obstetrics p. 203

(b) Lancet Feb 27. 1897. (Clifford Allbutt)

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 premonitory symptoms; or it may be swift & 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 resistive powers of the nervous system.

Hence, as factors in the causation of eclampsia, we have acting not only toxaemia, 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 Rosenstein & Traube referred the occurrence of eclampsia to cerebral anaemia; that Macdonald[a] inclined to the same belief; that Tyler Smith & Herff[b] laid stress on the primary nervous irritability. Moreover, the fact that eclampsia is greatly aggravated by labour, pain, peripheral irritation, and mental shock, is very significant.

With regard to the treatment of eclampsia, it is both prophylactic and

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a) "Heart Disease during Pregnancy". London 1878

b) Centralblatt f. Gynäkologie 1892.

curative. The preventive treatment consists in the most careful regulation of the excretories and in careful feeding. Abnormal anaemia will then be prevented, and toxaemia 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 if tube casts make their appearance the question of induction of labour comparatively early may have to be considered; and if nervous symptoms develope, 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 first be left to nature, or forcible interference avoided as far as possible. Vaginitis, especially if the eclampsia is severe & the patient shows evidence of extreme cerebral congestion & high vascular tension a small venesection is sometimes advisable; or

Compression of the carotids after the method of Trousseau may be tried; and in all cases it is of the highest importance to secure purgation. I have used castor oil, one dose placed on the back of the tongue, with good effect; and between attacks if the patient can swallow, a full dose (60 grains) of Pulv. Jalapae Comp.

As early as possible the uterine membranes should be ruptured, so as to relieve the intra-abdominal pressure. Then if the convulsions are not 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 the forceps. She had one severe convulsion afterward but made a good recovery.

Much diversity of opinion exists as to the

advisability of forcible dilatation of the os, & of forcible delivery. But every case I think ought to be treated on its own indications, and, if the situation is desperate, it is certainly very necessary to relieve the uterus 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 forceps with the patient well under chloroform. Turning (is known) to be avoided on account of the irritation it entails.

In all cases drug treatment can do much, and when it is able to keep the condition from becoming extreme there is no need to interfere over-hastily with the natural delivery. Chloroform is of the greatest value, and should be used invariably when labour coexists with eclampsia; & I believe that its exhibition is indicated in every labour when an eclamptic state is threatening. It is well, as Playfair has said,[a] to give it intermittently with some

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a Lectures & Practice of Midwifery vol II p. 331.

Sedatives having a continuous effect, as for instance, chloral. I have given the hydrat of chloral in 15 grain doses repeated every 3 or 4 hours, along with the bromide of potash, and am satisfied that the seizures have been thereby diminished. The chloral also can be given subcutaneously in 5 grain doses every four hours when the patient is comatose.

With regard to morphia hypodermically, I have only used it in one case, the worst case of eclampsia I have had. The patient was a primipara aged 27, of strong neurotic temperament, & 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. The os 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. I therefore injected ¼gr.

subcutaneously & began the administration of chloroform. The morphia was repeated in ¼ gr doses every four hours, and the chloroform was given at intervals, during the pains. Labour lasted about ten hours and was natural throughout. On injection of morphia was given after labour, and then the patient took chloral & bromide. The total number of eclamptic seizures was four, and all occurred in the first stage of labour. The last one was slighter 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 recommended in eclampsia there may be mentioned pilocarpin and the nitrite of amyl: but I do not see how they meet the main indication in the treatment of eclampsia, — sedation, and I have never used them. The excretory effects of pilocarpin will probably be as well, if not better, attained by free purgation.

Epilepsy:

I have in nearly every instance where 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 of well marked epileptic seizure long after the termination of gestation, when kidney trouble 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 does 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 these cases I believe are uncommon. I have only once 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 medicinal treatment. There was never albuminuria. She had an instrumental confinement & made a good recovery. I attended her again in her third confinement a few days ago, & am able to say that since the seventh month of her previous (2nd) 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 previous to her second pregnancy 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 made worse by the coexistence of pregnancy. But the prognosis as regards the continuance

of the bad effects after cessation of gestation is probably better in cases where the epilepsy has commenced only during pregnancy than in cases where it has been present previously.

The pathology of the condition is quite obscure. In defining the disease, Taylor[a] lays stress on the absence of demonstrable brain lesion, peripheral irritation, or toxaemia, & 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 convulsive phenomena could be inferred." A sharp line of demarcation is thus drawn between epilepsy and the eclamptic condition; and the theories of peripheral irritation & toxic poisoning 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 now & then an explosion of nerve force, — a so-called "nerve

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(a) Frederick Taylor. "The Practice of Medicine" — p. 296

storm"; Hughs Jowes is careful to differentiate between an explosion produced by excess of force, & one due to deficient resistance in the grey matter.

In any case, admitting this hypothesis of cellular instability, it is clear that the nerve condition in 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 raised 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 excreting functions.

Hysteria:

I have occasionally heard it stated, and it seems to have been formerly a common belief, that hysterical states are foreign to pregnancy, and, if previously present, are favorably influenced by it. The idea is quite erroneous, and would appear to have based itself on the fact that now & then a pregnancy, "greatly desired & occurring amid the most favorable conditions," exercises on both mind & body a healthy stimulus, whereby the organism is physiologically steadied, the mental process calmed 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 where there has been any functional perversion 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 hysteria

is apt to show considerable variation of form. Sometimes it is neurasthenia that is pictured, or melancholia, chorea, nervous anorexia, neuralgia, diabetes insipidus, asthma; and not uncommonly there may be actual maniacal excitement. In the latter event only is the prognosis grave, as labour may occur during the mania, & injury to the mother or child may result; or the delirium 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 these 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 puerperium were absent. There was never at any time during the mania & convulsive 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 patients is largely mental & moral as in ordinary cases, but precautions must be taken to prevent the disease from interfering with the pregnancy. Nutrition 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 Weir-Mitchell treatment, to isolate the patient from her friends, enjoin absolute quiet and rest, push the feeding, & stimulate the tissue metabolism & the excretions by gentle rubbing exercises & careful attention to the emunctories. In mild cases & 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 patients confidence by faithful and patient attention without dissimulation."(a)

Catalepsy

This disease, in many respects closely analogous to Hysteria, has been noted as occasionally occurring during pregnancy. An interesting case is recorded by Shoot of Lunwarden(b). The patient was a robust woman aged 44 with no family history of neurosis 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 pupil were dilated, but reacted to light. Under chloroform the muscles relaxed but the patient continued in a trance condition for hours. On awaking she remembered nothing that had taken place. The fits recurred three

(a) Davis. American Textbook of Obstetrics p. 221.
(b) 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 & had no more attacks after the first week of the puerperium, when she had two. Shortly after the first attack her child when she had previously been suckling was seized with dysphagia & had a cataleptic fit, the symptoms being precisely those of the mother. The rigidity which developed relaxed during a warm bath but soon afterwards returned. Tonic cataleptic convulsions recurred and the child "died after two days duration of the cataleptic fits."

Osler[a] believes that, like trance, catalepsy occurs usually in connection with hysteria & is to be treated as such. The probability of nutritional disturbance is to be remembered The patient should therefore as in all state of hysteria be placed in a healthy environment & well nourished, special care being taken to prevent any aggravation of the toxaemic condition peculiarly present during pregnancy. The bowel & kidney condition should therefore be well cared for.

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[a] Osler. Princ. & Pract. of Medicine p. 1119.

Chorea.

This is by no 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.[a] Among predisposing causes are mentioned acute rheumatism & interstitial rheumatic tarint, scarlatina,[b] epilepsy & other functional nervous diseases,[c] cardiac disease,[d] & emotional disturbances such as sudden fright, grief &c; and pregnancy predisposes 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 months of pregnancy,[e] when the general nutrition may have been upset by recent vomiting, & when the system has not yet begun to recover

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(a) Playfair. Science & Practice of Midwifery p. 253

(b) Prof. Simpson. University Lectures 1893-4.

(c) American textbook of Obstetrics (Davis) p. 214

(d) Halliday Croom. Lectures 1893.

(e) American textbook of Obstetrics. p. 214.

from the strain and adapt itself to the new conditions of metabolism. In 39 out of 55 cases quoted[a] by Simpson, the attacks began before stirrage.

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 Osler.[b] 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 nerve cells in the motor areas. The occurrence of the disease during pregnancy would appear to confirm the latter view, as also the coexistence of toxaemia 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

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(a) Prof. Simpson. Lectures to Students 1893-4.
(b) Osler. Chorea & Choreiform affections. 1894.

motor & intellectual centres & in the spinal cord. "In mild cases the motor cortex only is implicated, and the spinal cord least often".(a)

In a communication to the London Obstetrical Society 1891, M'Cann has classed the cases 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 uni-lateral, 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; & even

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(a) Davis. American Textbook of Obstetrics p. 214.

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 pupils are dilated. There is often considerable mental impairment and a quite remarkable loss of memory power.

The hysterical chorea of McCann 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 rhythmical. They are rarely 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 & delusions, by certain paralyses. Cardiac murmurs of haemic 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[a], 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[b] choreic contractions in the uterus were quite perceptible, the organ presenting now & 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 255 cases collected by Buist of Dundee[c] no less than 45, or 1 in 5 proved fatal; and other computations place the mortality even higher, at 27·3%. In a large proportion of the cases the fatal result appears to be due to complications

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(a) Halliday Croom. Lectures to Students. 1893.
(b) Trans. Obstet. Soc. Lond. 1891. p. 486.
(c) Trans. Obstet Soc. Edin. Vol XX p. 145.

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 choreic condition disappears at once on delivery. In one case indeed it continued for five months after labour.[a]

The cessation of the movements 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 disturbance when it occurs during pregnancy than at other times;"[b] and in cases complicated by mania or delusions the prognosis must especially be guarded, as mental defect often persists 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

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a. American Textbook of Obstetrics. p. 215

b. Playfair. Science & Pract. of Midwifery p. 254

make their appearance in the early months; and the knowledge that the decision is so serious and that after 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 healthy & pleasant surroundings amid abundant fresh air, and enjoined complete mental & bodily rest; while the feeding should be frequent & nourishing. 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 subdue the violence of the movements & promote quiet & sleep, and, on the other hand, to assist nutrition, combat the exhaustion, & give nerve 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 Fairdner[a]

(a) Glasgow Medical Journal 1870

where a girl only 8 years of age had taken 60 instead of 20 grains of chloral, & not only recovered but was permanently cured of her chorea.

As a sedative the bromid 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 fitly be given along with the chloral.

Sodium salicylate, wet packing, and the application of cold to the spine have been recommended by some observers (a); 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 antipyrin 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

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(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 inhibition 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, & 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 analagous 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 tonic treatment in chorea has long been recognized. Trousseau was accustomed to use strychnia in large doses, and more recently Gowers has advised this drug pushed 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 ~~sterling~~ good results, but on what grounds is not quite clear. Even however if it acts merely by improving the general nutrition its exhibition cannot fail to prove of benefit. Combined with abundant & well directed feeding it has been specially recommended in cases complicated by profound mental depression and neurasthenia.(a)

Occasionally in spite of all remedies 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

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(a) Davis. American Textbook of Obstetrics. p. 217.
(b) Playfair. Science & Practice of Midwifery p. 254

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. Trousseau, who first described the disease, called it "Contracture des Nourrices," for of 44 cases he found 40 among nursing women. The symptoms have been well described by Davis of Philadelphia,(a) 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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a) Davis: American Textbook of Obstetrics p. 246.

all over the muscular system; though this is rare. They are bilateral. There is no loss of consciousness. The attacks begin & end with a sensation of numbness & 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 reactions of the nerves in the affected regions are much increased;" & vomiting & diarrhoea may be present.

The prognosis is comparatively good both as to life & 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 successive pregnancies.

Occasionally the disease proves fatal, though Trousseau thought this rare. Dakin,(a) however, has reported one fatal case.

Meinert saw five cases and in recovery.

(a) Trans. London Obstetrical Soc. Vol 33. p. 163.

Albuminuria and glycosuria have each been associated by different observers with the condition. In the non pregnant I have seen a condition of dilatatio ventriculi and of intestinal tympanites present in three cases. The disease is more frequent too where the mental condition is one of depression; and Playfair [a] thinks it is "probably always connected with causes producing general weakness."

The treatment is usually successful, and consists in the promotion of nutrition and nervetone 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 alone with medication. For the spasm the bromide of potassium or chloral may be tried, as also morphia, physostigma, or cannabis indica. Chloroform is not often required, but certainly relaxes the contraction.

Causes immediately predisposing, such as bowel or stomach disturbance, should be always treated.

(a) Playfair. Science & Practice of Midwifery I - p. 255

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[a] 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 causation.

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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[a] Giles: Trans Obstet. Soc. Lond. 1894.

intense enough to prevent the patient from taking her breakfast, or there may be actual vomiting, coming on sharply & several times repeated but with often no retching. The vomited matter is usually acid glairy mucous, sometimes bile stained, and after its ejection the patient often takes food with appetite & 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 indeed 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 appearance 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 the 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 confinement.

In another class of cases the symptoms are throughout serious and may prove actually fatal. They are the cases of persistent or pernicious 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 instances 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 & vomiting, and loses weight rapidly. Profound nervous irritability is often present, and I have indeed seen acute hypersensitiveness to light & sound. The abdomen becomes tender to pressure, and epigastric pain is present in many cases. The tongue is thickly furred, dry & cracked, & the breath is very foul. The pulse becomes small & wiry; sometimes "running" in character, — and is usually greatly quickened. Arterial tension is diminished. There is a profound degree of anaemia present, and signs of blood disintegration may be discernible in the vomit, in the excretions, & in purpuric extravasation. The temperature is subnormal at first, but as often happens in advanced anaemia, may

lates become somewhat elevated. Profuse sweating may occur. The patient acquires soon a most haggard & wasted appearance, recalling in many respects both typhoid fever and the meningitic conditions. The superficial and deep reflexes are greatly increased, and in one case I have noted the so-called "tache cerebrale" as distinctly present. It is rare however to find paralysis or atrophy of muscles.

The prognosis in the extreme form of the disease is always grave. Of 118 cases collected by Gueniot, 46 died, and of the 72 that did not, 42 owed their recovery to the occurrence of abortion.(a) 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 & more faint and death supervenes from cardiac exhaustion. In cases where pregnancy has terminated before a fatal

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(a) Playfair. Science & Practice of Midwifery I. p. 234.

result has ensued, the symptoms often disappear with marvellous rapidity, nutrition quickly re-establishes itself, and there is to all appearance 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 emesis; a diminution of the sickness in the waking hours; ability to retain food; the presence of appetite, without sudden & unnatural craving; the absence of precordial distress; a lowering of the pulse rate and temperature; cessation of profuse sweating; and a return to the normal conditions 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 & vomiting in non-pregnant women may also by coincidence be present in gravid women, as, for instance, cancer of the stomach; chronic gastritis, whether

gouty, alcoholic, or caused by arterial sclerosis; gastric ulceration; nephritis in its various forms; brain tumors; hysteria; irritation of the stomach by the pathological conditions 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 the vomiting; for "it has been shown by Lomer & by Frerichs 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 this 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 others,(c) is still of the rarest occurrence,

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(a) American Textbook of Obstetrics p. 225

(b) Ibid. loc. cit.

(c) Playfair - Science & Practice of Midwifery I. p. 270.

and is generally met with as a sequel to jaundice, a condition rarely associated with anaemia during pregnancy; and it is further known that while vomiting occurs ~~frequently~~ generally in the early months only, acute yellow atrophy 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 ovum, stretching the walls of the uterus, produces irritation of the contained nerves, and so sets up those reflex movements in the stomach that produce emesis. 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[a] to the old observation

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[a] Science & Practice of Midwifery p. 162. I.

that where the sickness is entirely absent its place is often taken by other & more distressing sympathetic derangements, such as asthma or cardiac syncope. This point has been further emphasized by Bedford,(a) together with the fact that in such circumstances women are particularly prone to miscarry.

Certain pathological conditions of the uterus have also been held responsible for the production of the reflex irritation 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 Davis(b) 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

(a) Diseases of Women & Children p. 535-1.

(b) Trans. American Gynecological Soc. 1894 vol. 19. p. 110.

advanced by Grailly Hewitt,[a] who maintains that the entire cause of the sickness is to be found in flexions of the uterus 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 $\frac{2}{3}$rds of the cases, and that consequently it is "difficult to believe that two pregnant women out of three have a flexed uterus."[b]

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 necropsy in a case of persistent vomiting occurring during gestation. He found in the liver and kidneys those evidences of acute degenerative changes

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(a) Grailly Hewitt. Severe Vomiting during Pregnancy. London 1890.

(b) Playfair. Science & Practice of Midwifery 1898. p. 162.

which are 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, median, and peroneal nerves, being especially well marked in the phrenic. The organs of the foetus showed fatty degeneration of the liver & necrosis of the kidneys. Indeed, the entire appearances 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 Stembo[a] in 1896; and here likewise were discovered signs of extensive polyneuritis, due apparently to the influence of some toxic material.

More recently still, Clifford Allbutt[b] has brought the pregnant state into comparison with the infections, and indicates persistent vomiting as due not to mere reflex excitability, — which he denominates a "superficial explanation, easily assigned;" — but to the presence during

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a. Deutsche Medicinische Wochenschrift 1896. No. 27.
b. Lancet. Feby 27. 1897. p. 581.

gestation, of a circulating toxin. The fact that the symptoms are not so marked in multiparae 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 forward. Reasons has already been given for discarding the theory that an acute yellow atrophy of the liver is, per se, 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 uterus naturally, and producing reflex effects through the sympathetic nervous system; the other, that it is due to central or direct nervous irritation wrought 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 not a few instances alleviated, if not actually cured, them. The importance of this fact has been strongly urged by Graily Hewitt in his interesting monograph on the Vomiting[a]; and although his theory is for obvious reasons untenable, there can be no doubt that the cases on which it has been based 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.

(a) Graily Hewitt. Severe 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 greater irritability; or it may be that the brain nutrition has been in some way altered as the result of circulatory changes taking place during the same period. At all events 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 increased 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 uteris may be set up by the first movements after awaking, and the vomiting may result from it reflexly, and may itself, when often repeated, cure it.

Another argument in favour of the reflex origin of the condition is found in the improbability of toxic influences 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[a] 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 there 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 synovial conditions appearing, is in support of the theory of reflex causation: and, finally, the fact that the diseases specially associated with toxaemia, such as eclampsia, rarely occurs till late in pregnancy, is against the explanation that

a) Clifford Allbutt. Lancet Feb. 27. 1897.

that vomiting is due to autointoxication.

Probably the cause of sickness in pregnancy is complex and associates reflex irritation, anaemia, impaired nerve nutrition, & 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 cured one case at least of habitual vomiting in the early months by a very free use of Assafoetida & Valerian.

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

Following the indications observed in the treatment of neurasthenia & 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 before 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, & sip a glass-ful of milk and lime water, or even take a little bread or biscuit; then, in the morning, immediately after she awakes for breakfast, to administer a cupful of hot coffee, & 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, teaspoonsful of iced milk, with or without soda or lime water, are very beneficial; or, on the other hand, teaspoonsful of very hot water may give most relief. Sparkling Kumiss is strongly recommended by many observers. Often, however, the condition will only subside on the taking of some special article of food & 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 pleases.

Should recourse 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 effervescing draughts containing 3 or 4 minims of the dilute Hydrocyanic acid, frequently repeated; or tincture of Nux Vomica given in 2 minim doses, repeated every half hour with a tea-spoonful of very hot water; or the Vinum Ipecacuanhae in drop doses every hour. In nearly all cases I give the Oxalate of Cerium, on the plan recommended by Sir James Simpson, and have often found it to give relief.

Among other remedies in use are cocaine, menthol, pyroxylic spirit, chloral, bromides and morphia, and in special cases one or other of these may be found to be efficacious; but opiates should as a rule be avoided. The extract of Cannabis Indica I have found useful in some cases, particularly where the sickness commences late in pregnancy.

Rest in bed is in every case important.

External applications; mustard & the Spiegelium, ice 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 uterus retroflexed and pressed into the hollow of the sacrum. I reduced the displacement under chloroform, and there was no more vomiting. The patient wore a Hodge pessary for two months, until the uterus had risen well above the brim, & there was no vomiting after its removal.

In cases where the uterus is anteflexed the Garrick air ball pessary recommended by Hewitt is very useful.

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

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(a) British Medical Journal. June 6. 1891.
(b) Playfair. System & Practice of Midwifery I. p. 236.

acute congestion of the cervix Clay of Manchester was accustomed to employ leeching.

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

In cases where the cervix is stenosed, dilatation has been advocated by Copeman[a]; but is more practised in America than in this country. As in all cases where operative interference has to be tried in the pelvic region 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.

(a) British Medical Journal. May 15. 1875

Ptyalism & Other Secretory Disorders.

Various derangements of secretion, consequent on sympathetic irritation, have been noticed during pregnancy. The saliva, the tears, & the sweat are among the secretions often remarkably increased. Of these the sweat secretion is the least often affected, but in poorly nourished and neurasthenic cases it is undoubtedly sometimes found to be in excess. The lachrymal secretion is sometimes exaggerated also, but it is generally in cases of ptyalism that this is the case. A remarkable instance is reported by Neiden.(a) The tear secretion was here so abundant as to keep the eyes continually suffused & cause an eczematous eruption of the lids. The secretion was weakly 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% per cent cocaine solution.

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

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(a) Davis, American Textbook of Obstetrics. p. 240. (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, & the vomiting of pregnancy had been absent. The patient was in the sixth month of pregnancy when I saw her, and the ptyalism, though not severe, was well 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.

Ptyalism 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,[a] enormous, and calculated to cause considerable anxiety. If long continued and excessive, it produces a certain amount of anaemia and weakness. There is usually

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[a] Science & Practice of Midwifery: p. 240.

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 Ptyalism there is no remedy that is of much effect. Topically, tannin, chlorate of potash and other astringents have been used as also ice and cocaine. Playfair mentions inhalation of turpentine & creasote.

Externally, 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. Opium 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 & continues throughout gestation, and it is most common I think in primiparae. 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, & there is no sputum, no hectic, no increase of pulse rate. The cough in fact is essentially nervous in origin, & is caused by reflex influences from the uterus. In character it is dry & explosive, often high pitched, and coming on in paroxysms. The attacks are increased by excitement.

The cough requires little treatment unless excessively distressing; but in any case it is obstinate. Antispasmodic remedies are indicated, as for instance, belladonna or hyoscyamus: & sedatives such as bromide of potash or hydrocyanic acid may be combined with them. Pastilles of menthol & 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, & 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.(a)

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[a], 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 tumours of the uterus.

In two cases recorded by Hyde Salter[b] the influence of parturition 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 labour, 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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(a) Croom. Edin. Med. Journal March 1892.

(b) Salter. Asthma, its Pathology & 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 Crowm in 1892.[a] In this case asthma appeared soon after conception, "was coextensive with pregnancy, 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, Crowm 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;

(a) Edin. Medical Journal. March 1892.

thirdly, that instead of occurring at one or two oclock in the morning, as asthma generally does, it occurred immediatly 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 spasmodic condition of the bronchial muscles due to reflex irritation from the uterus. Goodhart & (b) others have termed

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(a) Diseases of Women & Children p. 550-1.

(b) British Medical Journal 1891. vol II p. 2524.

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 productive of the paroxysm, but it serves to accentuate somewhat the "neurosis" aspect of the disease.

As regards the theory, advanced by Haig[a] 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

(a) Uric Acid in the Causation of Disease 4th ed. p. 310.

substantial character in favour of it. The conditions of uric acid excretion and of deranged blood pressure which it assumes are not yet precisely calculable, & clinically the association of asthma and uric acidaemia, especially in pregnancy, is not very apparent. The toxic causation of asthma during gestation is, however, not improbable, and in view of the high toxaemic condition 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 this 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, lo-

-belia and stramonium with good effect; also the Kathmos preparations and De Joy's cigarettes. In acute cases I have given morphia 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 & chlorate of potash are also indicated, but I have never seen them do any good. Nitrite of amyl is however sometimes serviceable, and during labour I have seen a few whiffs of chloroform vapour have a marvellous effect. The experiment of Chloroforming 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 & the bowel 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 nerve pain due to direct and organic pressure on the nerve trunk affected, and limit the term "neuralgia" to cases of purely functional 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 favour the theory advanced by Gowers, that it arises from central causes producing disturbance of function in the nerve cells governing the nerve tract concerned. It occurs most frequently in the early months of pregnancy, & in women of decidedly nervous disposition or neuropathic 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 neuralgic complications arising in pregnancy. Too much stress cannot be laid on toxaemias, so great is the effect they have on the nutritive process of the body. They comprise both autointoxications 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 the intemperate 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 malarial fever there, I have seen acute neuralgia develope in her pregnancy after her return to Cumberland, & be accompanied by ague-like intermissions of 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 I am

not 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 pure neuralgia, and in such case Playfair recommends the employment of large doses of quinine; but in other cases it takes the form rather of toothache or pulpitis, 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 secretions acting on the teeth. Hence the treatment of the mouth during

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(a) Playfair. Science & Pract. of Midwif, I p. 241.
cit: Oakley Coles. Trans. Odont. Society.

pregnancy is of great importance in any case where signs of propensity tooth decay make themselves evident. The teeth can be antiseptically treated or "stopped" when the decay is slight; and even when it is advanced & extraction is the only remedy, there is no reason why the operation, if carefully performed under chloroform, should give rise to any bad results. I have on one or two occasions seen several teeth removed under such circumstances, & have not observed any bad effect.

Separate from the pure neuralgia of pregnancy one must class nerve 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 instances, of a persistent aching type, and is aggravated

principally to the obturator or sciatic nerve areas; but often it is lancinating in character and radiates downward even to below the knee. In any case, 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 entirely from pressure on the nerve trunks 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 5th nerve; or the condition will be found to depend upon anaemia, depressing causes 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 persistence. The patient should however always be placed in the best conditions as regard fresh air, nourishment and personal hygiene. Anaemia should be steadily combatted by the administration of small

doses, frequently repeated, of iron & 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, port 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 bromides, with chloral, can be given in large doses; and in severe cases morphia 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 abnormality in the position or condition of the uterus and its appendages should be rectified. If there is any accumulation of retained faecal 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 minimised as much as possible. In pelvic neuralgia where no apparent cause exists a rectal suppository containing 10 grains of Phenacetin 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. Earache is almost invariably derived from the lower. In any case, if carious stumps can be identified with the distribution of pain complained of, they should be removed. Local anaesthesia can be induced by cocaine or the chloride of ethyl, so that there is little risk of nerve shock attending the extraction. Even in cases where there is extensive tooth decay, & where several stumps require to be drawn, chloroform ~~should~~ can be given and the operation done exactly as in non pregnant patients. I have never any harm from it.

(a) Davis: American Textbook of Obstetrics. page 210.

Headache:

Severe headache is by no means an uncommon accompaniment of pregnancy. I believe few gravid 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 often when not pregnant. The headache may be frontal, vertical or occipital; uni- or bilateral. They may be constant or transitory, & due to causes either central of or peripheral. The anaemic condition in pregnancy, the nervous excitability, the altered conditions of blood pressure, the nutritional changes, the increased peripheral irritations, the toxaemic state — are all predisposing causes; and in pregnant women disorders of gastric and intestinal function, albuminuria, insomnia & 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 gastro-intestinal tract, and with central irritation

irritation from toxic substances circulating in the blood, and with alterations of blood pressure within the cranium. Haig & others associate the attacks with uricacidaemia, and there is no doubt that just prior to and during the attacks the output of uric acid is diminished. Other observers have shown the influence of excitation. The attacks are paroxysmal & often last a day or two. Recurrence is frequent, and there may be marked periodicity in the attacks. The symptoms are not specially different from those found in ordinary cases in the non pregnant, but if anything they are more acute.

The treatment, having regard to the conditions prevailing during pregnancy, consists in the amelioration of all nutritive deficiencies, the promotion of an improved blood condition, the correction of gastric and intestinal disorder and the most careful regulation of the emunctories. 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 bowels should be kept well open,

and all the conditions of personal hygiene attends too. States producing unnatural reflex irritation such as eye strain, uterine disorder &c should be treated when present.

During the attacks, the bromides, citrate of caffein, Phenacetin, tincture of guarana, and cannabis indica are among the remedies I have generally tried and sometimes seen benefit from. A good combination is that of caffein citrate 2 grs with Phenacetin 8 grs repeated every three hours. Antefebrin 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 of 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 spirits & 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 nitrogenous foods at bedtime is sometimes particularly beneficial, 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 assist-
-ance. 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 when the general blood pressure
is high, as so often happens in the later months
of pregnancy, it is sometimes difficult to
control insomnia. Drugs often have but little
effect, & at best give only a 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 ~~rarely~~ beneficial in
a few cases, but is not very reliable.

A great deal of good may be gained in cases of
high blood pressure arising by the employment of
saline cathartics & diuretics, and if the bowels
are 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 undubitably 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, peevishness, 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 inhibitory power; the patient becomes acutely impressionable; there is great caprice of temper; and the most curious likes & dislikes are developed. The most amiable woman may become moody, factious & unreasonable; and there may be a condition bordering on melancholia. It is rare to find dementia of any type, but some cases show exaltation mental state even to the extent of actual mania.

It is however seldom that the mind is

quite deranged in the course of pregnancy. In fact, Clouston has recorded his opinion[a] 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 pregnancies".

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 melancholia is however 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[b]. and, among predisposing causes there

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(a). Clouston. Mental Diseases p. 555

(b). Ibid. p. 555.

may be noted heredity, the neurotic temperament, previously existing neuroses, mental shock, alcoholism & toxaemic conditions.[a]

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 Edinburgh Royal Asylum[b]; Furstner[c] 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. Stats of mental apprehension & of moral reaction has 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. Toxaemia appears sometimes to invite the onset of maniacal conditions from its irritative effects on the cerebral centres; and in some cases it

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a. American Textbook of Obstetrics p. 222.
b. Edinburgh Medical Journal. vol X.
c. Archiv. f. Psychiatrie Bd V. Heft 2.

has been observed to produce delusions and hallucinations.(a) In this connection it is interesting to recall the various theories of the production of puerperal insanity after labours by toxins absorbed from the genital tract.

The onset of mental derangement during pregnancy is generally gradual; and the delusion generally assumes the form of melancholia. There is usually no pronounced stupor. A certain amount of neurasthenia is often present, and the initial symptoms are often no more than those incident to a condition of neurasthenia. But the depression of spirits, irritability & emotional susceptibility; the marked likes and dislikes, the caprice of temper, the egoism, selfishness, morbid introspection and the hypochondriacal tendencies, assume by degrees a character distinctly pathological, and deepen not merely into "melancholy," but into a well marked and genuine melancholia. Suicidal impulses are not uncommon. There is a loss of interest in surroundings, a disinclination for

(a) American textbook of Obstetrics. p. 222.

social life, an alienation of affection often for home & husband; and in nearly all cases there is apprehensiveness, a fear of some impending disaster or of death at confinement. Sleep disturbances are very common; the patient feels unrefreshed & often distinctly worse in the mornings; and there is sometimes loss of weight.

Moral perversion is common, a disposition to lying and stealing, and to alcoholic indulgence being often remarkable. Tuke 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 made its appearance; and the patient, a primipara, was quite cured of the indulgence a termination of her pregnancy, though previously to it she had been accustomed to take alcohol, often to excess, at each succeeding menstruation.

The occurrence of well defined "Kleptomania" has been mentioned by Laycock as characteristic

of the insanity of pregnancy; and Playfair directs attention[a] to a curious case recorded in Caspers work on Forensic Medicine[b], where "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."[a]

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 delusions, 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 altered widely in character by association with different forms of functional nervous disease. Hysteria, Epilepsy, Chorea,

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(a) Science & Practice of Midwifery II. p. 336.

(b) Trans by Sydenham Society Publications. vol IV. p. 308.

hysteroepilepsy, hypochondriasis, neurasthenia has 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 reacting upon and intensifying the others".(a)

The prognosis in the insanity of pregnancy is guided necessarily largely by the character of the underlying or causal conditions; but, it is, on the whole, favourable. Out of Tuke's 28 cases, 19 recovered in six months, and Clouston reckons the total recoveries at over 70 per cent.(b) In Menzies's cases the recoveries amounted only 43.3 per cent.(c) The percentage is higher with melancholia than with mania; but even then is below that obtained in the insanities which occur after labour, though the latter are much more frequently of the maniacal type. The duration of the disease

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(a) American Textbook of Obstetrics p. 216.
(b) Mental Diseases. Clouston p. 565.
(c) American Textbook of Obstetrics 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 Marcé did the insanity disappear before confinement.(a) Delivery would therefore appear to accelerate a cessation of the symptoms; according to Clouston in 60 percent of the cases.(b) 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, according to the conditions underlying or exciting; but otherwise is in no way special. Much depends on the physical condition & on the way in which the various organs discharge their function. Conditions of mal-nutrition and of neurasthenia should be carefully investigated, with a view to the correction of

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a. Playfair Science & Practice of Midwifery III p. 337.
b. Clouston. Mental Disease. page 555.

nutritional defect, and too much attention cannot be paid to the feeding. Speaking generally, in all cases where an intense neurotic element previously existent is in pregnancy still more exaggerated, and especially when it expresses itself in hysteria, neurasthenia or other definite functional disease, the feeding should be very thorough, and should be carefully regulated; there should be complete mental rest, and, when the physical condition is low, bodily rest also; the social surroundings 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 & 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 toxaemic condition it is very important to get rid of the poison, circulating in the blood, as quickly as possible, and therefore

stimulation of the excretion through the bowel, skin & 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 bowel at bedtime, assisted by a moderate diuretic medication will produce sleep often better than anything else.

In the neurasthenic melancholias 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 & complicated with by 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) Clouston. Mental Diseases. p. 560.