

Robert Young

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*Thesis*  
*On Puerperal Fever,*

*"Cita mors venit, aut victoria laeta"*

*By Robert Young*

## Introduction

The human female, differing as she does from all other females in the erect position of her body, requires a more accurate adaptation in the size of her pelvis, to the bulk of the full grown foetus than is at all necessary in other parturient animals in order that she may be capable of progression during gestation. The smallness of the pelvis in the human female, is in some degree compensated by the imperfect ossification of the cranial bones in the foetus, which renders parturition much more easy than it otherwise would be, notwithstanding this however labour is more difficult & attended with much more serious consequences, both to mother and offspring, than is the case amongst the lower animals. There is indeed a certain portion of the human family amongst whom parturition is comparatively easy. Such for instance is the case with the Negro or Black races - who rarely are confined in Childbed for more than one day.

at a time - and are commonly able to follow their usual avocations The ~~day~~ day after delivery; Some persons aware of this fact, have not hesitated to deny the necessity of assistance to women in Childbed, asserting that the difficult labours of the European & other white races - arose or was a consequence of their effeminate habits - being ignorant of the real cause, viz. the greater size of the head in the white races - So great an effect has the increased size of the head on the Character of the labour, that it is a well known fact, that labour with a boy is much more difficult than it is with a girl - & much more fatal to both mother and Child - simply from the greater size of the head in the one case than in the other - There are many causes, which I need not here enumerate, that give rise to tedious & painful labour, and the consequent protraction may be the immediate cause of death, or it may by exhausting the vital powers, predispose the patient to other diseases - Moreover women are liable to many dangerous

accidents during- or immediately after delivery- such as hemorrhage, rupture of the uterus- laceration of the perineum &c, all of which require the attendance of an Accoucheur many of these accidents he can prevent or modify- and perhaps in no case is his attendance more imperatively called for than on the occurrence of Puerperal fever

### Puerperal Fever

Puerperal fever is one of the most fatal diseases incidental to parturition. It occurs sometimes sporadically- but frequently also in an epidemic form and then its ravages are truly frightful, so much so that Dr Hulme has declared it to be as bad as the Plague. These epidemics prevail for the most part during the Winter or Spring months- moist and cold weather apparently being favourable to its propagation. The term puerperal fever as applied to this disease has been the occasion of much dispute amongst medical men- the term itself indicating nothing more than a fever occurring in connection

with Childbirth. The consequence of this has been that many practitioners have described under the name of puerperal fever diseases very different in their character both as regards the symptoms & results and some have maintained the exclusive right of the variety witnessed & described by them - to be called by the name of puerperal fever - others. as Dr Lee who considers the fever to be symptomatic - would discard this term altogether and substitute instead Peritonitis &c - The nature of the so called puerperal fever varies much in different cases - at one time it is of an adynamic or low malignant typhoid type not in general accompanied with much pain, at another time the fever is eminently sthenic and in general attended with more or less peritoneal inflammation and abdominal pain & tension

### Historical Notices

This disease was noticed as early as the time of Hippocrates and was by him attributed to obstruction of the lochia - - -

Avicenna also coincides with his opinion as to the cause of the disease - Plater in (1602) describes the disease & considers it to be due to an inflammation of the uterus Sennert (1656) thinks the disease is owing to a suppression of the lochia & recommends bleeding - Riverius (1674) is also of opinion that the disease is caused by a suppression of the lochia - Willis (1682) observes that the fevers of lying-in women are much more dangerous, than those which happen in common, and that they differ in character both from a simple & putrid synochus. We also find the disease noticed in the works of Strother (1718) Cooper (1725) - Sydenham (1726) - Boerhaave (1737) - Mauriceau &c, all of these authors regarding the disease as caused by an inflammation of the uterus. As there is no mention of any epidemic of this disease in the works of the above authors, we may conclude that the disease prevailed in a sporadic form only - Indeed the first undoubted epidemic of puerperal fever on record appears to be

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that which occurred in the Hotel Dieu  
of Paris in 1746 when scarcely any recovered  
from the disease who were attacked with  
it, and on examination after death al-  
-buminous exudations were found in  
the peritoneal cavity. sometimes having  
the appearance of coagulated milk ad-  
-hering to the surface of the intestines and  
besides there was a copious effusion of  
whey-like serum - Pouteau describes the  
malady as appearing in the Hotel Dieu  
of Lyons in the spring of 1750. it was  
very fatal. he noticed sero-puriform  
effusion into the peritoneal cavity -  
thickening & contraction of the Omentum  
- a relaxed, softened state of the uterus -  
and gaseous distension of the intestines  
as the post mortem appearances - he  
regarded it as an epidemic erysipelatos  
inflammation of the ~~peritoneum~~ peritoneum.  
Dr Hall wrote an account of Puerperal fever  
in 1755. Sauvages viewed the disease as an  
inflammation of the uterus occurring 1<sup>st</sup>  
in the puerperal state 2<sup>nd</sup> associated

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with typhoid fever, 3<sup>rd</sup> with suppression  
of the milk. Stoerck gives an account of  
an epidemic of puerperal fever which broke  
out in the Hospital of St Mark in  
Vienna in 1770 and prevailed throughout  
the City during the two following years,  
It was characterized by abdominal pain  
and swelling, with uterine inflammation  
& gangrene, The intestines being covered  
with false membrane. Dr Denman published  
a treatise on this disease in 1768 ---

Dr Manning (1771) ascribed the disorder to  
a putrid tendency in the humors ---

Dr Hulme (1772) gives a detailed account of  
puerperal <sup>fever</sup> as witnessed by himself, with  
the post mortem appearances, He found the  
omentum in most cases inflamed & gangrenous  
and was of opinion that the disease depended  
in a great measure on this lesion ---

He was followed soon after by Leake  
& White who each published a treatise  
on this subject, and were of opinion  
that it was of an inflammatory nature  
associated with a putrescent disposition

Kirkland (1774) considered the disease to be caused by absorption of putrid matter from the uterus, secondly from inflammation of the womb and thirdly from the retention and absorption of morbid secretions and excretions. He also considered, that whilst the absorption of morbid matters, and inflammation ~~origin~~ originating in the uterus - would cause the disease - that abdominal lesions would be a sequence of the fever when it occurred primarily, - puerperal fever appeared in the Hotel Dieu of Paris in 1774-75 - and during the middle and close of the eighteenth century it was observed by numerous physicians - and more or less detailed accounts of the malady with its pathology, and treatment was given in the works of various authors who wrote during this period, as. Banc, Burserius, Butter, Flecker, De La Roch, Frank, Doublet Walsh &c. In 1787-88. the disease broke out in the General Lying-in Hospital London, and a description of the post mortem appearances was given by Dr John Clarke

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inflammation of the peritoneum was the most constant lesion. He remarked that the uterus and ovaria were sometimes involved along with the peritoneum, but not more frequently nor more remarkably than other parts - and that the interior surface of the uterus, was not inflamed. In 1795 Dr. Gordon of Aberdeen in a treatise which he then published gave an account of an epidemic which occurred in that city it was characterized by peritoneal inflammation, He says "that the cause of this disease was a ~~sort~~ specific contagion or infection & I have unquestionable proof". He regarded ~~the disease~~ <sup>it</sup> as being of an inflammatory nature & had recourse to free blood letting in the early stage of the disease with great success, he also gave purgatives & opium in large doses.

Dr. Joseph Clarke describes an epidemic which broke out in the Dublin hospital he regards it as an inflammation of the peritoneum - and subsequently we have Hall - Fleg - Campbell - Mcintosh & Armstrong who are of the same opinion with regard to the

nature of the disease - By the recent ~~writers~~ authorities on this subject such as Capland Churchill &c puerperal fever is regarded as being both contagious & infectious in its nature and as being at one time sthenic or inflammatory at another asthenic or typhoid - having given a brief sketch of the history of puerperal fever - we may now proceed to consider its

### Pathological Nature

Perhaps nowhere do authors differ more in opinion, than they do in regard to the nature of puerperal fever, Thus we have Hippocrates, Avicenna, Galen, Celsus, Aetius, Paulus, Raynalde, Gal Plater, Sennert, Riverius, Sylvius, Strother, Mauriceau, La Motte, Sydenham, Boerhaave - Van Swieten, Haffmann, Julsieu, Villar, Astruc, Pouteau, & Denman, regarding it as an inflammation of the uterus - that this does frequently occur in connexion with puerperal fever no one will deny - but that it is at all essential to the disease is not borne out by facts as in many instances of well marked puerperal fever

no such lesion was indicated either by symptoms during life or appearances after death - Others as La Roche, Hulme and Leake, have regarded it as inflammation of the Omentum and intestines - And although this is perhaps a more frequent complication than inflammation of the uterus - and it would seem to have been present in all the cases seen by Dr. Hulme who in his work on puerperal fever gives the post mortem appearances of six cases that died from this disease in all of which there was inflammation of the omentum in a high degree, a great portion of it being in a gangrenous state - Still this only proves that it is a complication but not that it is the cause of the disease, It has been regarded as peritonitis by Waller, Johnston, Forster, Cruikshank, Bichat, Pinel, Gardier, Capuron-Gordon, Hey, Armstrong, Clarke, Campbell, Collins, &c - In many epidemics, and more especially in those, where peritoneal affections were frequent, exceptive pain & tenderness,

of the abdomen were generally present and observed early in the disease - so much so that it was considered to be pathognomonic of ~~the disease~~ puerperal fever and this along with the post mortem appearances induced many to believe that it was the cause - and it was only by extended observation and the careful study of future epidemics that this supposition was shown to be fallacious - It has been regarded as peritonitis connected with erysipelas or of an erysipelatos character by Pouteau, Home, Lowder, Young, Abercrombie - Gordon, Hey, Armstrong and Campbell - The arguments that might be adduced in favour of its erysipelatos nature are 1<sup>st</sup> that erysipelas has prevailed simultaneously with puerperal fever - such was the case in the epidemic which occurred in Aberdeen where they both began and also disappeared together - and the same thing has been observed in many other instances - more especially in hospitals

2<sup>nd</sup> That women confined in different wards, of the same hospital, where erysipelatous sores abounded, have been attacked with an inflammatory species of puerperal fever -

3<sup>rd</sup> That nurses engaged in dressing erysipelatous sores or medical men in making post mortem examinations of bodies that had been affected with that disease, may by subsequently attending - lying-in women in their confinement give rise to puerperal fever in such women - Dr. Poley of Ripon relates a case which came under his own immediate observation. A man who resided near Halifax was affected with a severe attack of erysipelas which rapidly terminated in gangrene - and whilst the Surgeon was in the act of dressing the sloughing sore he was called off to attend a female in labour to whom, he immediately went. This patient, and five others in succession died of well marked puerperal fever - although the disease was not then known

in the neighbourhood and had not been for many years. nor had any other practitioners any cases - And this is only one of the many <sup>instances</sup> ~~cases~~ that might be cited where the disease was apparently produced in the same way.

4<sup>th</sup> That erysipelas and puerperal fever have existed in the same individual at one & the same time and that the infants of women attacked by puerperal fever are very liable to erysipelas or diffuse inflammation - Thus it was observed during the epidemic of puerperal fever in Vienna - that the greater number of patients admitted into the hospital had erythematous spots about the joints chiefly on the hands & feet - And Dr. Locock says that the existence of erysipelas in hospitals or among the infants - where the mothers have ~~been~~ had puerperal fever has long been noticed

5<sup>th</sup> Both complaints are characterized by the great tendency there is to the deposition of pus, in various parts

of the body - Dupuytren in his *Lecons Orales*, speaking of erysipelas, says "that more than one half of those, who die from phlegmonous erysipelas fall victims to affections of the pleurae liver or other internal inflammations"; And it is well known that many such secondary affections occur in connexion with certain species of puerperal fever - It is also remarkable that the blood in ~~two~~ both affections is found to be similarly changed - as though it were mixed with some foreign matter - and decomposition in both cases takes place earlier than usual

6<sup>th</sup> The great danger attending inoculation with the effused fluids, during the examination, of the bodies of those who have recently died of puerperal fever with the almost immediate development of erysipelas in the member inoculated

Puerperal fever has been regarded as a disorder of a putrid nature by Pucc. Ligoz. Le Roi - White &c. In certain epidemics a

remarkable resemblance has been observed  
 (both as regards symptoms & progress) to  
 that species of fever, supervening on  
 a Surgical operation - when that oper-  
 -ation - has been followed by the absorp-  
 -tion of pus - or it may be caused from  
 the opening of a large lumbar abscess, or  
 one in connexion with the larger joints  
 of the body - Now the interior of the  
 uterus after delivery & more especially that  
 portion of it to which the placenta -  
 was attached, presents a wound very  
 analogous in its nature to that left  
 by an operation or amputation, and  
 therefore in a condition liable to take on  
 a certain amount of morbid action, under  
 such circumstances it is the less surprising  
 that there should be more or less suppuration  
 and absorption of pus or putrid matter  
 and the gradual detachment and disintegration  
 of the membrana decidua will tend to  
 render the uterine discharges more or less  
 putrescent - Further it has been observed  
 that puerperal fever is more common and

also more fatal in large cities and crowded hospitals - where there is a greater amount of putrid or unhealthy matter in the air respired - than in the country where the atmosphere is ~~much~~ <sup>more</sup> free from such impurities. The above are a few of the facts adduced in support of the putrid nature of this disease - -

There are others such as Willis, Puzos, Leuret, Doublet, Hamilton &c who regard it as a fever of a peculiar nature

Others as Petit, Selli, Kirkland, Walsh - Tenor, Linnelle, Lee, Ferguson - regard it as a disease of a peculiar or complicated nature

Others such as Finch, Stoll, Doucet, &c regard it as a fever with biliary disorder. In some epidemics there has been a marked tendency to biliary disorder as evinced by the patients becoming jaundiced but it is not a more frequent complication than many others, and not at all essential to the disease

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The opinions of many authors, would lead us to infer, that they consider puerperal fever, to be a secondary disease, or in other words, that the fever is the consequence and not the cause of those violent internal inflammatory affections so frequently met with in this malady - The objection frequently urged to this doctrine, is, that puerperal fever of a very fatal character has been observed, in which no inflammatory complications were indicated either by symptoms during life or appearances after death - and therefore they hold that the fever is not necessarily produced by inflammatory affections - so far this opinion is correct - but does it necessarily follow that ~~that~~ puerperal fever commonly so called, is never the result of inflammation - by no means - and there are many facts that go far to prove, that it has in many instances been the result of inflammation - for instance the ~~more~~ numerous well-

authenticated cases on record, in which the disease was communicated by physicians Students & Nurses, to their patients and more particularly in the case referred to by Dr. Paley. In such instances it is not improbable that the morbid matter applied directly to the abraded surface of the vagina excited inflammation there in the first instance, and consequently the fever must have been a secondary affection. - But although we are firmly convinced that the fever in such cases is symptomatic we are far from believing that puerperal fever is always so - and that for the following reasons first, because it is propagated where no direct communication existed between the parties affected - second - because in many cases no inflammatory affection was indicated - third - because it seems to depend on a peculiar atmospherical condition - and fourth - because the blood in many instances has been found very much deteriorated and resembling

that found in typhoid fevers —  
 Moreover the nature of the fever has been  
 found to vary much in different epidemics  
 at one time it is eminently sthenic, at  
 another decidedly typhoid, and many authors  
 attribute this latter form of the disease  
 to the altered condition of the blood  
 M<sup>r</sup>. Moire, says that he has seen a black  
 precipitate form in the blood taken from  
 a person labouring under the adynamic  
 form of puerperal fever — and such a de-  
 posit is often found in typhus — In the  
 epidemic which occurred at Paris in  
 1845 the fever was of a low malignant  
 typhoid type and M<sup>r</sup>. Bidault and  
 Arnauld describe the blood as having  
 a dark and semi-coagulated appearance  
 as in low typhus fever — In the epidemic  
 which occurred at Gratz in 1845 D<sup>r</sup>.  
 Schoeller states that the blood was very  
 fluid and exhaled a peculiar odour  
 like that of the bat — in other respects  
 it resembled the blood of a person  
 who had been poisoned by prussic acid

Dr Scanzoni has given it as his opinion that the special causes of puerperal fever originate in the altered condition of the blood, and mainly in the presence of pus - Dr Capland in speaking <sup>of the</sup> appearance presented by the blood in a low typhoid form of the disease says "that on every occasion I was struck by the peculiar faint odour of the blood; by the very soft state of the clot when the blood did separate into crassamentum and serum; by the appearance which occasionally presented itself; of a mass exactly resembling in colour + consistence a common jelly; The colouring matter covering the bottom of the vessel in the form of a precipitate; and by in some instances a slight separation only of serum, the large loose gelatinous crassamentum, consisting chiefly of this jelly-like matter; the lowest stratum of which contained the black or dark brown precipitate of colouring matter; these appearances of the blood were presented in several

Cases in the hospital; 'In 1823 and three or four subsequent years, in which cases blood had been taken before I saw the patients, It may here be remarked, that I have seen many cases of this form of the disease, in which leeches had been applied to the abdomen; but in nearly all; and especially in those which occurred in the hospital the blood which flowed from the bites did not coagulate; and great difficulty almost amounting to an impossibility of arresting the bleeding from them, was generally observed; owing both to the state of this fluid, and to the impaired vital cohesion of the tissues characterizing the advanced stage of the malignant form of this domestic pestilence"

The microscopic appearances of the blood in this form of the disease appear also to be abnormal, inasmuch as the structures occurring in healthy blood seem to have become more or less disintegrated

Thus it would seem that the typhoid type of the disease differs very materially from the inflammatory form - and would appear to depend principally on the vitiated state of the blood; and this opinion is the more confirmed, when we consider the manifest connexion existing between this disease and crowded ill ventilated hospitals in which all the conditions most favourable for producing such a vitiated state of the blood exist. From the great fluidity of the blood in this malady and its slight tendency to coagulation we would naturally infer that it was deficient in fibrine, and this element is generally supposed to be increased in inflammatory diseases - and such would seem to be the case in the more sthenic type of puerperal fever. In a case of puerperal peritonitis Dr. Simon found that the blood formed a tolerable firm clot, and was covered with a buffy coat of an inch & a half thick - and the chemical analysis gave an increase of fibrine; corresponding in this respect with

The results obtained by Andral & Gavarret, which are subjoined in the following table taken from Dr. Copland's Dict. of Pract. Med.

venesections		Water	Solid residue	Fibrine	Blood corpuscles	Solid residue of serum
1 <sup>st</sup> Case	1	787.2	212.8	5.5	122.8	84.5
2 <sup>nd</sup> Case	1	822.9	177.1	5.4	88.3	83.4
	2	831.6	168.4	5.3	73.6	89.5
	3	851.0	149.0	3.6	60.5	84.9
3 <sup>rd</sup> Case	1	786.4	213.6	7.2	117.0	89.4
4 <sup>th</sup> Case	1	789.4	210.6	3.8	120.0	86.8
	2	802.7	197.3	4.7	109.5	83.1
	3	813.5	186.5	6.1	100.3	80.1
Healthy Blood		790.0	210.0	3.0	127.0	80.0

From the above table it will be seen that there is an increase of fibrine with a corresponding diminution of Blood corpuscles

From the evidence adduced as to the nature of the disease we may conclude, first - that there are two distinct forms or types of puerperal fever, viz the inflammatory and typhoid; second - that an inflammatory form

may be produced, by the application of morbid matter to the abraded surface of the vagina after delivery; and that in such cases the fever is secondary or symptomatic -

Third - That the fever is liable to assume the typhoid type in persons who are ill fed - and of an asthenic constitution: or who are crowded into ill ventilated hospitals or much exposed to effluvia of a filthy or putrid character -

Fourth - That under such circumstances the typhoid form may be propagated without immediate contact with the parties affected.

Fifth - That puerperal fever is both contagious and infectious; as regards women who have recently been delivered.

Having mentioned the more important facts in connexion with the pathological nature of puerperal fevers we shall now proceed to consider what are its symptoms

### Symptoms

The symptoms necessarily vary much according

the disease is simple or complex, inflam-  
 -matory or typhoid. this latter form of  
 the malady is not in general accompanied  
 by so many internal inflammatory affection  
 as the former. The first symptoms  
 generally manifest themselves about the  
 end of the second or beginning of the third  
 day after delivery. Although in some in-  
 -stances they have occurred as late as  
 the eight or ninth month - and Dr. Collins  
 relates a case in which the patient was  
 attacked before delivery. similar cases are  
 mentioned by Dr. Clarke and Mr. Fley  
 but these <sup>cases</sup> are comparatively rare. the  
 vast majority being seized about the second  
 or third day - With regard to the period  
 of accession it has been generally observed  
 that those who are attacked shortly after  
 delivery are likely to have the disease  
 in a more aggravated form than those  
 attacked at a latter period

A rigor or cold shivering fit is frequently  
 the first indication we have of the  
 disease and this is more especially true

of the inflammatory ~~of the~~ form ~~and~~ this symptom was particularly well marked in the epidemic which occurred at Aberdeen as described by Dr Gordon. The rigor is more rarely observed in connexion with the typhoid form; but when it does occur: it is generally succeeded by a rapid pulse, which may vary from 100 to 132 pulsations in a minute, indeed it may sometimes exceed this in frequency, but rarely at least <sup>in</sup> at the commencement of the malady: as the fever progresses, the pulse becomes weaker, and increased in frequency, untill a short time before death when its pulsations can scarcely be counted. The frequency of the pulse, is one of the most constant symptoms of the disease & its value is now pretty well recognised by Accoucheurs: all of whom invariably testify to its constant occurrence in puerperal fever.

Abdominal pain - This is another symptom more particularly liable to occur in

in connexion with the inflammatory form - no doubt it is sometimes present in the more typhoid types, but never to the same extent; The situation of the pain generally depends on the local lesion present, thus if it be peritonitis it will extend over the whole abdomen or if it be inflammation of the uterus the pain will be confined more particularly to that organ and so on - The pain is persistent in its character, and sometimes so excessive that the patient cannot bear the slightest pressure not even the weight of the bedclothes; This symptom has been regarded as pathognomonic of puerperal fever, by many physicians, but it can only be regarded as such, in the inflammatory form of it, and even here it is sometimes absent.

Frontal headache: This is by some considered to be pathognomonic of the disease, but this is by no means the case, although it has been observed to occur pretty frequently.

in some epidemics when there were biliary complications present

The tongue is generally found to be moist and soft to the touch, and covered with a whitish fur, but as the disease advances, to a fatal termination it frequently becomes dry & rough and of a brownish appearance. and at this time the teeth generally become covered with a brownish looking sordes. very much resembling that which occurs in typhus -

Sickness of Stomach and Vomiting, This is sometimes a most troublesome symptom, but more frequently towards the latter end, than at the commencement of the disease. In a few cases it is present from the beginning; the matter vomited varies in appearance in different cases; and in the same case at different stages of the disease; most frequently it is of a yellow or greenish colour at first, becoming darker as the disease advances and it then somewhat resembles Coffee grounds in appearance; In some epidemics

vomiting has afforded a valuable hint as to treatment, inasmuch as it would appear that nature in this way was endeavouring to eliminate the poison from the system; and in such cases the administration of emetics has been attended with the best results

The State of the Bowels; These may be either costive or very much relaxed. In some cases a profuse or critical diarrhoea has been observed: being another way in which nature attempts to get rid of the disease

The Lochia: Show all sorts of irregularity in this disease: they are sometimes normal in quantity and appearance; at other times less florid and almost black; they are sometimes increased in quantity and very foetid: at other times in small quantity or entirely suppressed: This latter most frequently takes place when the uterus is inflamed

The Lactal Secretion; If this secretion is fairly established before the accession

of the disease, it generally continues for a few days: and then gradually decreases untill it ultimately stops altogether - on the other hand if the fever has manifested itself before the secretion has taken place the latter very rarely appears at all; In connexion with this secretion it has been observed that the mother frequently manifests a decided aversion to suckle her child, and is not at all solicitous about its welfare

The State of the skin, varies much at different periods of the disease at ~~one~~ one time it will be covered with a profuse clammy perspiration and in a few hours thereafter will be hot and dry, and so on, the one state alternating with the other. The patient is also liable to partial sweats, occurring for the most part about the face & breast. In some epidemics there has been a tendency to profuse or critical sweats

The Urine, This secretion in common with the others is generally more or less affected, it is usually scanty and high coloured; and this is more especially the case in the inflammatory form of puerperal fever; Some physicians have thought that a favourable indication was to be derived from the occurrence of a copious sediment in the urine some days after the commencement of the disease

The blind is seldom affected in this disease, the patient generally retaining her senses to the last, nevertheless delirium sometimes occurs in the worst forms of the disease and is in general a mortal sign, and too surely the forerunner of death

The Respiration is much affected when abdominal pain is excessive, in such cases a full inspiration by distending the abdominal parietes would cause intense suffering; hence the short and oppressed breathing

The Countenance (in the inflammatory form of the disease) is pale and has a peculiar anxious expression denoting great suffering: in the typhoid form it has more of a listless expression denoting great mental and bodily prostration - and in this state the patient frequently prognosticates her own death; assuring her friends that she will never recover from the disease.

It is needless here to state the symptoms as they might occur in any one patient as these must necessarily vary according to circumstances - we shall now proceed to consider the Causes of Puerperal fever

### Causes

Authors differ very much in their opinion with regard to the causes of puerperal fever: thus we have the older authors from the days of Hippocrates down to that of Denman ascribing it to

inflammation of the uterus; and by  
 Celsus & Sennertus, to accumulation of  
 noxious humours set in motion by  
 labour; by Cooper and Leake to violent  
 mental emotions, stimulants, and obstruct-  
 ed perspiration; by R. W. Johnson to  
 miasmata, admission of cold air to the  
 body, and into the uterus, to hurried cir-  
 culation, to suppression of Lacteal se-  
 cretion - to diarrhoea; by J. Millar to  
 liability to putrid contagion from changes  
 in the humors during pregnancy;  
 by H. Manning to hasty separation  
 of the placenta, to binding the abdomen  
 too tight; by Fley to sedentary employ-  
 ments, stimulating or spare diet, retained  
 portions of placenta, floodings from  
 non-contraction of the uterus;  
 by Hulme to inflammation of intestines  
 and omentum, from the pressure of the  
 gravid uterus against them;  
 by Moore to atmospheric distempera-  
 ments, to internal erysipelas, metritis,  
 phlebitis, to contagion of a specific kind;

In treating of the causes of puerperal fever, we shall divide them into two classes the first, the predisposing and second the exciting.

It is a well known fact that the mind exercises a powerful influence over the body, and that confidence in a particular remedy or in the skill of a physician tends to promote a patients recovery; hence the reason why mental emotions such as despondency fear &c by their depressing effects on the nervous system; may, under certain circumstances prove efficient predisposing causes, that this is true of puerperal fever the experience of certain physicians proves this. Dr. Leake says, "women of delicate constitution, who are very susceptible and continually agitated by hopes & fears, are of all others the most subject to puerperal fever and recover with the greatest difficulty. Consequently unmarried females, for obvious reasons are very apt to be seized with it, Dr. John Clarke also says "unfortunate single

women are much oftener seized with it than the married: Dr Armstrong thus refers to the same subject "it is well known that unmarried women do not recover so well as married ones: the mental irritation necessarily attendant upon their situation, considerably increasing the febrile excitement, rendering them extremely restless and thus augmenting the danger: Dr Campbell also says "in the present epidemic we had the most satisfactory proof of the influence of mental agitation in producing or aggravating the disease: for of eight women who had been delivered of natural children and were afterwards seized with this disorder, only two out of this number recovered;

Cold: The sudden exposure to cold after delivery: when, in consequence of the previous perspiration & subsequent depression, the body is peculiarly ~~to~~ liable to be affected by it, may under such circumstances prove a predisposing cause

The breathing of noxious gases or being exposed to putrid effluvia, may by vitiating the blood prove an efficient predisposing cause; The sources of these unhealthy emanations are unfortunately but too abundant in many lying-in Chambers; The bedclothes are usually soaked with the discharges which take place during delivery; this might be prevented to a great extent by the use of a wax or oil skin cloth covered with a small blanket which might be easily removed after the labor was over; as recommended by Professor Simpson. The Lochial discharge also tends to contaminate the air about the patient; in short if cleanliness be neglected, and if in addition the room be badly ventilated and over heated as is not unfrequently the case. There is it at all surprising that puerperal fever or some other diseased condition should be the result; but even this condition may be aggravated by the vicinity of cess-pools, or ~~the~~ openings of filthy drains

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Neglect of the Bowels, may in particular cases, prove injurious to the health of the patient. more especially if they have been irregular towards the latter end of pregnancy. The same may be said of improper or insufficient food -

Stimulants. The improper use of strong or spiritous liquors is not an unfrequent cause of inflammatory disease in lying-in women, and it is a very common practice amongst the attendants, of women in this situation, to give her such drinks, more especially if the labour be a tedious or difficult one, and that for the purpose of hastening it in the one case, and supporting the patients strength in the other.

Premature labour. as this is generally the result of a diseased condition of the body, and as the labour under such circumstances is frequently attended with considerable febrile excitement it may render the patient more liable to puerperal fever

Atmospherical Conditions, that the state of the atmosphere is intimately connected with the production of puerperal fever statistics gathered from the various epidemics that have occurred, would seem to show; thus the most fatal months in Aberdeen were October December & November; and in Edinburgh November December and January. In London, January March February December & May. In Paris, November October February. In Geneva, January March February Thus it will be seen that the cold months are generally the most fatal and this period of the year is generally characterized by moist damp weather and sudden alternations of temperature. But although we find the disease prevailing chiefly at this season it by no means follows that cold damp weather is of itself sufficient to cause the disease; but rather that it is a condition most favourable for the development of a peculiar miasm or poison, which acting in conjunction with other predisposing causes will give rise to the puerperal fever and-

This opinion is the more confirmed by the fact: that erysipelatos and typhoid diseases are found to prevail simultaneously with, and under the same circumstances and atmospherical conditions as puerperal fever -

The exciting causes are chiefly those which tend to produce an immediate local or general affection of the body; thus for example the air of the apartment may be so contaminated by fetid or putrid matters; as to vitiate the blood and produce febrile disease or violence done to the uterus may cause inflammation of that organ. either of which affections under the influence of other predisposing causes may ultimately terminate in puerperal fever

Premature Excess of any kind may prove an exciting cause by producing inflammation of the uterus - such for instance as getting up too soon after delivery - over exerting themselves in any way - sudden shocks or frights - inordinate

use of spiritous liquors - injury done to the uterus by the use of the forceps or other manipulations -

Portions of retained Placenta - This in some cases may give rise to considerable irritation by acting as a foreign body and hindering the proper contraction of the uterus - It may also ~~by~~ become putrid and in this state be absorbed into the system, vitiating the blood, perhaps giving rise to uterine phlebitis, and ultimately to puerperal fever

Contagion, that puerperal fever may be propagated by contagion and infection also I think is sufficiently proved by the numerous instances on record, in which the disease was apparently produced in this manner, we may adduce one or two cases as evidence on this point:

late Dr. Campbell, ~~late~~ of Edinburgh, who at one time disbelieved in the contagious nature of the disease - stated "that after examining the body of a female who died of the disease after an abortion; and ~~carrying~~ carrying

Some of the diseased parts to the Classroom; he attended the delivery of a woman the same evening without having changed his clothes; she died; next morning he went in the same clothes to assist a difficult case, the subject of which also died of the disease, and of others who were seized within a few days three shared the same fate. In June 1823 he assisted at the dissection of a case, when from want of accommodation he was unable to wash his hands with due care; he was soon after called to two patients requiring assistance, and went without farther ablution and without changing his clothes and both these were seized with the disease and died.

Dr. Gordon of Aberdeen states that the malady attacked only those women, who were attended by a physician or nurse who had previously attended those affected with it. he farther states that he had abundant evidence, that any person who had been with a patient in puerperal fever

became charged with an atmosphere of contagion which affected every pregnant or puerperal female

D<sup>r</sup>: Goock relates a case in which a Surgeon after opening the body of a woman who died of puerperal fever continued to wear the same clothes and delivered a lady a few days afterwards who was attacked with the disease and died, two more of his patients were seized in rapid succession and also died. He then suspected the transmission of the infection by his clothes, changed them, and met with no more cases of the distemper

At Sunderland forty out of fifty cases of puerperal fever occurred in the practice of one Surgeon and his Assistant And there are many more cases of the same nature that might be adduced; notwithstanding this however there are some who deny its contagious nature Character and adduce as a reason, that all are alike exposed to the epidemic influence which produced the disease in the first instance

and therefore all the cases that occur may be due to the same cause. But the same might be said of typhus, small-pox &c yet no one doubts of their being contagious. And it might be asked, how they account for the increased ratio in which those are attacked who are exposed to direct contact with the poison? for instance puerperal fever prevailed in the lying-in hospital of Vienna in the wards which were attended by students and not in those attended by nurses. This led to an investigation and Dr Semelweis came to the conclusion that it was owing to the impregnation of their hands with cadaveric matter through dissecting, making autopsies &c and he forbade any examination of patients after handling dead bodies, until after some time had elapsed: and he farther directed every student, to wash his hands in a solution of Chlorine prior to, and after every examination of living subjects, the result was

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a diminution of the mortality from  
1-in 10- to 1-in 70.

Classification. Before proceeding to consider the means of diagnosing this disease it may be necessary here to allude to the different arrangements adopted by various authors in their classifications of puer-peral fever - it is needless to give in detail these different methods, but simply to mention that the disease has been divided into three, four, five, or six varieties, according to the local lesion found in each - no doubt this system has its advantages, but it has also this objection that the disease is seldom met with where there is only one local affection present, and so far as the constitutional symptoms are concerned we think with Dr. Gooch and others that the disease might be divided into two varieties the Inflammatory & Typhoid

Diagnosis. The inflammatory forms of

The disease occurring either as peritoneal or metro-peritoneal-puerperal fever: or whether the complication be <sup>inflammation of the ovaries</sup> ~~ovaries~~ or two or more of these combined, are indicated by their mode of accession: by the seat of pain and tenderness. by the vascular reaction following the shivering fit. by the state of the pulse which may be hard and bounding or full and firm but always quick generally above 100. by diminution or suppression of the lacteal secretion by irregularity in the lochial discharge by the state of the tongue. by the state of the bowels which are frequently costive at the commencement and loose or irregular afterwards the feculent matter being more or less foetid. by the scanty secretion of urine and its altered appearance: The amount of constitutional excitement present will in a great measure depend on the nature of the complications present, and ~~these~~ these will in general be indicated by the seat of pain & tenderness

I Thus puerperal peritonitis will in general be indicated by intense abdominal pain, and tenderness on pressure; generally commencing in the hypogastric region and thence radiating over the abdomen; the tenderness becomes excessive as the disease advances so that the slightest pressure, not even the weight of the bedclothes can be tolerated by the patient; and she is generally found lying on her back with her knees drawn up, in order to relax the abdominal parietes and thus relieve the tension and pain; shortly after the disease is established the abdomen becomes tumid and tympanitic, and at a more advanced stage effusion may be detected by percussion

1 Peritonitis is distinguished from after pains or hystericalgia, by its latter appearance, by the persistent character of the pain, by the constant, quick and encreasing pulse, by the size of the uterus. In after pains the pulse is increased in frequency but only during a pain. The pain itself is only temporary but liable to recur at short

intervals: and the pain is accompanied by a perceptible contraction of the uterus, which is not the case in peritonitis where the uterus is generally enlarged. -

2<sup>nd</sup> From Intestinal irritation; This affection rarely appears before the termination of the first week after delivery; peritonitis about the end of the second or beginning of the third day: The abdominal pain is diffused and does not radiate from the uterus as in peritonitis; nor is the uterus enlarged or tender; the abdomen is not so tense nor so tender on pressure: but there is more gastro-intestinal disorder the tongue is loaded, there is nausea vomiting flatulence and constipation or diarrhoea

3<sup>rd</sup> From Ephemeral fever or weed.

Although this disease may resemble puerperal fever very much at first, yet its duration is much shorter, its decline more rapid; its constitutional symptoms less severe; and there is also less abdominal pain and tenderness, and the lacteal secretion is generally unaffected

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**II** *Hysteritis* will in general be indicated also by the situation and character of the pain, it being chiefly confined to the uterus, and not diffused over the abdomen as in peritonitis. The uterus is found to be enlarged hard and tender, the pain being much increased when pressure is made upon it. There is ~~see~~ occasionally much pain and difficulty in passing water and the lochia are usually suppressed.

**III** *Inflammation of the Ovaries & Uterine appendages.* As this disease is generally more or less complicated, with inflammation of the peritoneum, the local symptoms are somewhat masked. The pain is less severe than in general peritonitis and is most intense in one or other of the iliac regions or the lateral parts of the hypogastrium sometimes extending to the groins and down the thighs; in making an examination per vaginam a small swelling or tumour will sometimes

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be found in the situation of the ovary

IV Uterine Phlebitis. In the early stage of this disease it is somewhat difficult to distinguish it, from simple puerperal hysteritis, but as the disease advances the formation of abscesses in various parts of the body, the sallow or yellow colour of the skin, the liability of other organs to become secondarily affected, the typhoid type of the fever, all, but too surely indicate the disease to be uterine phlebitis

The Typhoid type of Puerperal Fever may be distinguished from the inflammatory forms, by the marked difference in the constitutional symptoms, and the comparatively slight amount of abdominal pain; its accession is not in general characterized by rigors or shivering, as in the inflammatory forms, the pulse is also more soft and compressible and sooner becomes small

weak and irregular. The tongue is moist flabby and tremulous and of a whitish appearance. There is generally little or no thirst. vomiting is more constant in this form of the disease than in the other - The matters vomited are generally of a dark colour somewhat resembling coffee grounds in appearance - The bowels are loose and generally much more fetid than in the inflammatory form, and the lacteal secretion is more seldom suppressed. The lochia generally are more abundant and more putrid than in the other forms and the skin more moist and clammy. There is generally more vital depression and apathy. The abdomen frequently becomes tympanitic and there is eructation of flatus towards the end of the disease which generally runs a rapid course. The excretions are passed involuntarily the power over the sphincters being lost: the countenance has not that pained and anxious expression commonly

observed in the inflammatory form

Prognosis. From the great fatality of this disease the prognosis is generally unfavourable; If in the inflammatory form of this malady the pain gradually diminishes and the pulse becomes less frequent and the secretions and excretions more natural: there is good reason to expect a favourable termination. If on the otherhand the pain goes on increasing the pulse be undiminished in frequency the respiration short and oppressed or if the pain should cease suddenly or if delirium should supervene: then we may dread a fatal termination

In the Typhoid form the prognosis is much more unfavourable than in the inflammatory, it is a good sign if the pulse becomes less frequent and more natural: the skin warmer and less clammy. the bowels quiet and the discharges less foetid: on the contrary it indicates a fatal termination

if the pulse becomes weak and small but increased in frequency, if the skin be moist and clammy and the extremities cold, if there should be incessant vomiting of dark coloured matter or frequent liquid foetid stools passed involuntarily, if the mouth and throat become apthous, the patient under such circumstances is not likely to recover

Treatment Perhaps in no other disease has the treatment been more varied than in puerperal fever and this on account of the different forms the disease is liable to assume. Thus we have one epidemic treated with success by blood letting, another by emetics another by diaphoretics another by Calomel & opium &c. first as regards blood letting; that this method of treatment is beneficial in the truly inflammatory forms of the malady when had recourse to at the commencement of the disease, is

proved by the experience of many eminent physicians. but that it is not applicable to all the varieties of the inflammatory form is equally proved - if general blood-letting be had recourse to in the more asthenic forms it is very apt to make the disease assume the typhoid type. In such cases leeches only should be employed if indeed blood letting be at all applicable; local abstraction of blood is sometimes had recourse to when there is inflammatory affections of the uterus and its appendages, and in some of these cases general blood letting would be injurious: hot fomentations over the whole abdomen, when these can be borne by the patient, are benificial; rapid counter irritation over the whole abdomen may be ~~or~~ had recourse to with advantage, at the commencement of the disease. for this purpose Professor Simpson recommends a concentrated tincture of Iodine stronger by two or

three grains to the ounce than the  
 common pharmaceutical preparation;  
 this is to be painted over the whole surface  
 of the abdomen; turpentine sprinkled  
 over a cloth ~~very~~ rung out of hot water  
 may be used for the same purpose.  
 Turpentine has been used internally  
 with success at the commencement of  
 of the disease, and has been particularly  
 recommended by Douglas and Capland.  
 Purgatives are in general contra-indicated.  
 The bowels are to <sup>be</sup> kept quiet and moved  
 as seldom as is consistent with the  
 health of the patient; and if any ob-  
 -struction should occur it is better  
 to give an enema. Opium has been  
 found of great service in the treat-  
 -ment of this disease. it is given in  
 small doses so as not to excite vomiting  
 for if this did occur its good effects  
 would be negatived; some combine  
 the opium with Calomel but this  
 might give rise to a troublesome  
 and fatal diarrhoea. In some epidemics

of this disease where there was a tendency to eliminate the poison from the body by means of the bile as ~~it~~ was evinced by the patients becoming jaundiced and having a tendency to vomit: Emetics were given according to the indication of nature and the result was that almost all were cured who were thus treated. In another epidemic diarrhoea was the indication of nature and it was treated by purgatives with great success. And in the same way Sudorifics and diuretics have been used.

In the treatment of the typhoid form strict reference must be had to the vital powers of the patient. In this form of the disease active depletion or blood letting is inadmissible. but quinine, Camphor, Capsicum and other diffusible stimulants & correctives may be used with advantage: if the lochia be very foetid as is usually the case, vaginal injections of tepid water or weak tea may be had recourse to: or a very weak solution of Chlorinated Soda

may be used for the same purpose. When the disease seems to depend on the absorption of putrid matter from the uterus; ergot of rye may be given for the purpose of stimulating that organ to more perfect contraction and in this way hinder farther absorption. Whatever plan of treatment may be adopted great regard must always be had to the constitutional symptoms: and if nature gives any indication as to the method of cure it should unhesitatingly be adopted.

Post mortem Appearances. The lesions observed after death from puerperal fever vary much according to the type or complications present during life. They are also more or less influenced by the nature of the infecting agent, and the manner in which the poison enters the system. In the inflammatory or sthenic type of this disease the alterations of structure, whether confined to the peritoneum, or to the uterus and its appendages or whether it involves

all these parts: resembles more or less those changes of structure which are the results of primary and uncomplicated inflammation.

The peritoneum being frequently affected in this form of the disease is found red and vascular more especially that portion of it covering the uterus, which appears in most cases to be the part primarily affected. It is common to find ~~the~~ it also covered with a layer of lymph, by which the omentum and intestines are frequently agglutinated together: The omentum has been found highly inflamed and partly gangrenous, as for instance in the cases described by Hulme: Serum mixed with lymph is generally found effused in greater or less abundance into the peritoneal sac, it varies much in appearance in different cases: being sometimes clear or turbid at other times of a yellowish white colour, and having shreds of lymph floating ~~str~~ in it, or it may be of a red<sup>d</sup>ish colour in consequence of the effusion of blood, which sometimes takes place in great abundance.

Sometimes the effused fluid has a curdled appearance the more consistent part of it resembling recently curdled milk and this is found often adhering to the intestines and more dependant parts of the pelvic viscera - It was the marked resemblance of this effusion to curdled milk which led ~~some~~ <sup>some</sup> ~~led them~~ to ascribe the disease to a metastasis of that secretion

The cellular tissue under the peritoneum and around the uterine vessels is sometimes found to contain pus & serum - -

In the more malignant or typhoid type of puerperal fever, where the vital powers are more depressed, and the vascular reaction much less: the alterations of structure are of a very different character the changes consist chiefly of a greater lacerability or impaired cohesion of the tissues; in this form of the disease the peritoneum may present a slightly congested and somewhat thickened appearance the congested patches being frequently of a livid colour and the membrane itself

being easily torn: The omentum is also found to be much softened and of a reddish brown colour and sometimes so easily torn as to be almost incapable of sustaining its own weight.

The effusion of serum into the peritoneal sac is in general not so abundant as in the inflammatory form. but it always possesses a remarkably offensive odour.

The Uterus is frequently found to be increased in size and soft and flabby in appearance its peritoneal coat bearing well marked indications of inflammatory action in its increased vascularity and thickened appearance: this membrane is also frequently coated with lymph. Large abscesses containing purulent matter sometimes are found in the parietis of the organ and false membrane of coagulable lymph mixed with blood and Lochia in its interior The veins and sinuses of the uterus are frequently found inflamed their coats being thickened and their canals irregularly contracted.

pus is frequently found in the veins, and the lymphatics are sometimes distended into small pouches with puriform matter; In the typhoid form of the disease the uterus has been found very much softened and friable being easily broken down with the fingers as if it were semi-putrid. These morbid changes are generally farthest advanced at the place where the placenta was attached and in its immediate vicinity

The Ovaries and Uterine appendages usually present traces of inflammation the ovaria being congested, swollen and easily broken down, sometimes infiltrated with pus at other times they are imbedded in lymph the result of inflammation of their serous coat; sometimes they are completely disorganized and converted into a cyst containing pus: The fallopian tubes may be softened and deeply injected with blood, lymph, serum, or pus:

The Heart is sometimes found very much softened - flabby or even friable especially

in the malignant typhoid form of the disease: A sero-sanguineous fluid is occasionally found in the pericardium)

The Pleurae in the more malignant forms of the disease often participate in those structural changes which are found to take place in the peritoneum; and this is more especially true of the diaphragmatic: This membrane is found to be more easily torn than usual and in some places it presents an edematous discoloured appearance owing to the infiltration of a sero-sanguineous fluid into the subcellular tissue! The Pleural cavities are sometimes found to contain a turbid or whey-like serum --

The Lungs are often found congested with dark fluid blood especially the inferior lobes: They are sometimes found infiltrated with puriform matter and sometimes contain abscesses in those cases where uterine phlebitis had existed

The Stomach usually presents no particular morbid lesion but sometimes small patches of its mucous membrane are found of a red and inflamed appearance. When vomiting has been excessive there is usually more or less effusion of a clear reddish serum between the mucous and muscular coats: in some rare instances the stomach is found to be perforated but many suppose this to be a post mortem change.

The whole intestinal canal is generally much distended with air - and usually contains a brown or greenish looking fluid matter: that found in the stomach is frequently of a dark colour resembling that vomited immediately before death.

The Liver is occasionally found to be soft and much more friable than usual: it may be congested or pale and it is sometimes found to contain purulent deposits:

The gall-bladder is frequently distended with greenish viscid bile.

The Spleen is generally softened and

somewhat enlarged and occasionally so friable as scarcely to admit of being-handled

The Kidneys usually present inflammation of their peritoneal covering and depositions of pus are sometimes found in their substance. They may be engorged with blood or softened; Their veins are sometimes found loaded with pus or puriform matter. This is generally observed in connexion with uterine phlebitis or inflammation of the ovaries and uterine appendages

The Eyes in some cases are also affected the conjunctiva becomes inflammed or the eyelids may be swollen and there may be effusion of lymph into the anterior Chamber of the eye and in this way the sight may be destroyed

Deposition of purulent matter occasionally takes place into the larger joints of the body such as the Hip, Elbow, Knee, ankle Shoulder and Wrist joints. This principally occurs in connexion with protracted uterine phlebitis

Comparative frequency of the different complications as they occur in puerperal fever

"In 222 cases Zonnulli found traces of peritonitis in 193. In the remaining 29 no peritonitis. In 197 he found disease of the uterus for example: simple inflammation of the uterus and appendages. Inflammation of the uterine veins and lymphatics. Softening and putrescence of the uterine parietis -

In 62 cases the ovaries were inflamed

In 90 cases there was inflammation of the veins

In 40 cases inflammation of the lymphatics alone

In 49 cases the uterus was softened superficially

In 29: deeply in 20

In 29 cases ~~the~~ traces of pleurisy - in 6 others an effusion of blood in 8 of serum into the pleural cavities

In 27 cases the lungs were affected - viz in

10 cases there was pneumonia, in 8 abscess

in 4 tubercles, in 3 gangrene, in 2 apoplexy

In 14 cases there were purulent deposits in the muscles in the joints in 10 cases in the cellular tissue of the pelvis in 6 cases

In 3 cases there was abscess of the liver

In 2 cases abscess of the Pancreas - - -

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D<sup>r</sup> R. Lee gives the post mortem appearances in 45 cases. of these the peritoneum was inflamed in 32 cases, the uterine veins in 24 cases. In 10 cases there was softening of the uterus In 4 cases pus was found in the absorbents. The peritoneum presented no morbid lesion in 13 out of the 45 cases and there was no phlebitis in 17 cases

D<sup>r</sup> Collins gives the post mortem appearances in 37 cases in all of which the peritoneum was more or less affected. there was effusion of ~~blood into the~~ ~~thor~~ fluid into the thoracic cavities in 7 cases the fluid resembled that usually found in the abdomen. there was effusion into the peritoneal cavity in 30 cases in twelve of these the fluid was of a straw colour and in eighteen it was sero-purulent and of the consistence of thick cream. in 7 it consisted of sanguinolent serum which had a glutinous feel when rubbed between the finger and thumb. These last cases were rapidly fatal and no coagulated lymph was found in them. In the

other cases lymph was deposited in large quantities, more especially in the vicinity of the uterus. The uterus in most of the cases was natural in appearance in some it was soft and flabby; and in a few unhealthy matter was found in the sinuses. The ovaries in many instances presented marks of inflammation being generally enlarged and softened so as to be broken down with the least pressure.

Duges found in 341 deaths, peritonitis in 266 cases, of these 266 peritonitic cases he found the uterus affected 3 times in every 4 cases. The ovary once in 7 cases perforation of stomach 10 times in 266 cases inflammation of stomach & intestines 4 times in 266 Pleuritis (single or double) 40 times in 266 cases Pericarditis 6 times in 266 cases Arachnitis once in 266 Purulent deposit in muscles 8 times in 266.

15  
Development of "Erythras" from insect  
with first stage visible  
Note exactly Erythras  
A. D. M. S. (M. S. D.)

Protoplasma  
Units length of the worm

Places Post note - appearance of the  
treatment <sup>13 weeks</sup> - Crinoid  
height of eye - treatment 15"

p. 44 Semichowals