Thesis.
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On Surgical Fever.

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An idea of the dangers which are apt to accrue from a wound of the body, whether inflicted by the knife of the surgeon, or by a severe accident, must have been known to be dreaded ever since surgery was cultivated by intelligent observers of nature. It must have been early seen that it was not sufficient to guard against the more immediate dangers of haemorrhage and shock, or to endeavour to prevent the occasionally arising evils of delirium, delirium tremens, stupor, epidemics etc., to ensure the success of an operation. For the great majority of patients perish from none of these accidents, but from some more obscure affection, subsequently supervening. To guard against this unknown but well-recognised mischief, the older surgeons, and among them Hippocrates, used to subject their patients to various kinds of treatment as purgings, bleedings etc. as prophylactics against whatever disease might follow the operation. One of the earliest attempts to ascertain the cause of surgical fever was made by that most illustrious of philosophers and pathologists,
Boucherave, he says: — The matter being absorbed by the lymphatic veins, or else pressed into the mouths of the eroded blood-vessels, it then mixes with the blood, which it infects, and, being collected in the viscera, consumes them with abscesses of the worst kind, disturbs their functions, and by that means produces an infinite number of diseases of the very worst kind.

Van Leukten in his commentary upon this aphorism remarks — That matter being absorbed by the contiguous orifices of the veins, infects the blood with a purulent cacoëthymy, whence a hectic fever and consumption follows. Matter confined by any cavity of the body may be thus absorbed by the mouths of the veins, and mixed with the blood. This fact we are taught by many observations. And again — Matter being too long confined may be absorbed by the veins and mixed with the blood, to as to be afterwards deposited in several other parts of the body. The event of this translation is very doubtful and various, according to the nature of the particular part in which
The matter is deposited from the blood. For matter can scarcely be absorbed until it is first attenuated and rendered acrimonious, and when it afterwards flows with the blood through the veins, it acquires a still greater acrimony; whence fevers of the worst kind, a corruption of the blood itself, and an infinite number of diseases follow. It is from this absorption of the matter that those frequently perish, who have received a large wound, which daily affords a large quantity of matter; as, when an aneurism has been cut out, or a limb amputated. The matter by being absorbed will produce a purulent carbuncula, with all its consequent maladies.

Morgagni after having quoted a number of cases in which abscesses were found in the liver, lungs, etc., after wounds of the head, and quoting Molinelli as having first shown, that these secondary deposits arise also after wounds, goes on to discuss the question of their origin.

For in general we find tubercles either in the lungs or in the liver, which have not
yet suppurated, but present the hardness of glands. Still the patient may die before any of these have formed pus. For it appears, according to these observations, that pus found elsewhere in the visceræ is not always deposited in the form of pus, but that not infrequently some of its particles become mixed with the blood and disseminated are arrested in some of the narrow passages, and by obstructing and irritating these, offer an obstacle to the circulation of the humours and become the cause of a much larger quantity of pus than that which was primarily introduced — a suppuration indicated by rigor and violent symptoms. This explains why more pus is found in the visceræ and elsewhere than the wound could supply, and why many purulent particles are found in the pleura, lungs, joints, kidneys &c. after ulcers, abscesses, wounds of the head or any other part, &c. &c.

Subsequent authors such as Petit attributed this kind of purulent fever to the spontaneous generation of pus in the blood.
In 1731, John Hunter published a paper on the
transactions of a Society for the improvement of the improvement of medical and Chirurgical knowledge in which he showed that the inside of veins might become the seat of inflammation and abscess, and that in all violent inflammations of the cellular membrane after compound fractures and surgical operations, the coats of the larger veins become considerably affected. He accounted thus for inflammation and death occurring after amputation, and he stated that in such cases we have often a series of abscesses between the orifice of the vein along its course to the heart. He had observed after phlebotomy in horses that the inflammation often extended from the point of incision to the chest, and he believed that death was caused either from the inflammation extending to the heart, or that the matter escaped from the suture of the veins passed along that tube in considerable quantity to the heart and mingled with the blood.

Iam inclined to believe, he continues, that the exposure of cavities of the larger veins in cases of accidents, and also of operations, is often the cause of many of the very violent inflammations which often attend these cases, and indeed may be the reason, why
inflammations extend or spread at all beyond the sphere of continued sympathy. He states that this event may occur after even the most trifling operation, and suggests that a compression should be put upon the vein above the suppurated inflamed point, succeeding which is altogether useless.

The whole subject remained unconsidered for 30 years till in 1815 Hodgson founded an analogy between surgical and puerperal fevers, on the fact that in both diseases pus was found in various veins, and he also remarks that the symptoms of phlebitis are analogous to those of lymphatic fever. Others about the same time pointed out the agency of phlebitis in the production of the fatal train of symptoms in puerperal women. A case recorded by him, of puerperal fever had nearly all the veins of the abdomen filled with purulent fluid. Puerperal fever he says caused death because pus gets into the blood by the branches of the portal vein, and the circulation cannot go on.

In 1823 Volkman published two memoirs upon the subject and he sums up his opinions in the form of a series of aphorisms.
1. That the patient who dies from acute diseases after severe operations, or from a profuse suppuration, will most frequently from pleurisy, and from the formation of more or less numerous abscesses in the viscera.
2. That this pleurisy, as yet undescribed, is of a special nature, visceral and might be called the pleurésie purulente des opérés.
3. That it differs from simple pleurisy, in its rapid, though latent progress, and more frequently terminates in death.
4. That such abscesses never attain a large volume, they always form small spots, sometimes concrete, sometimes fluid.
5. That they are generally deposited in the liver or the lungs,
6. They rarely give proofs of their existence.
7. That the influence of the absorption of pus and its transportation through the general circulation produces those two diseases.
8. In short, that in every case where their existence was not doubtful, the patient had died, without any treatment having the least effect.
Saunier in 1828 published a valuable memoir showing the frequency that pus was found in the veins after phlegmonous fever, but he does not seem quite decided whether to attribute its presence in the visceras to inflammation in the veins, to which he first gave the name of phlebitis, or to the blood itself when pus is mingled with it, becoming the agent of general disturbance and local irritation. A few years later we find a dispute among pathologists as to the source of the pus. Two opinions were then held. The one was that pus entered the vessels by absorption; the other, without altogether denying the absorbed power of the veins, maintained that it was the result of phlebitis. Riker, Belpien, Maréchal held the former, while Saunier, Brouss, Blandin de Mantigny held the latter opinion. All these authors have a leaning to the mechanical theory, except Saunier who was humoralist enough to know that the effect of the pus globule could be none other than to poison the blood. Saunier Crvelhier Bierard de Race subsequently
Written on the subject, without adding anything to our knowledge. Cruveilhier indeed held a retrograde idea, as did Dupuytren, and Depier, the latter by his doctrine of a purulent diathesis. Tashelman and Ducrot and Ledellot have made a series of excellent observations upon the effects of pus injected into the blood and laid down the proposition absolutely that the train of fatal symptoms that often follow operations, and to which many names have been given, as always produced from the admission of the pus globule into the blood. The first two authors in enquiring how pus enters the circulation ascribe it to phlebitis, Ledellot to purulent absorption. There is no advance here, nor to this day is the question settled. And whenever that preliminary difficulty is removed one can still the complicated enquiry to meet us. When the pus is once in how does it act on the blood? I regret that my enquiries have added nothing to the previous knowledge of the phenomena.
I shall first treat of the symptoms, diagnosis, and prognosis of surgical fever.

The first symptom is almost invariably a rigor of more or less severity. The elevation of cold is well marked, and the patient requests an addition to his coverings. This symptom had struck all careful observers as being almost pathognomonic of apoplexy, before any hernia had been formed or an alteration in the blood.

"Have you had any thinning?" was the first question which Meppeen always put to operation patients. Meppeen, however, states that the disease may run its course without a rigor. This fact may seem to rest upon his good authority to be absolutely denied. But it must be recollected that the surgeon may not see his patient till the period of their severity is past, and they may have escaped the attention of his immediate attendant, or the patient himself when questioned may have forgotten their existence. A patient who died in this hospital a few hours after a well-marked rigor strongly denied that he had had any. The rigor may vary in severity and in duration. It may be slight and
Transients are usually followed by warmth, or it may be violent and protracted, accompanied by trembling of the limbs, knocking of the teeth, and a feeling of incoherence advancing coldness over the back and sides. It may last only a few seconds, and be checked by the internal application of warmth, or, resisting all attempts at treatment, may endure forty or fifty minutes. Between these two extremes all varieties are found. The rigor is shortly followed by heat and reaction corresponding in degree to the previous chilliness. The patient then often begins to sweat freely, and his face may probably be bathed in perspiration. The rigors are always repeated within the next twenty-four hours, and often return in rapid succession, at much shorter intervals. They are always most dense at first, afterwards they become more transient, and before death, cease entirely.

The inspirations now become deeper and more frequent, indeed, their frequency is in proportion to the severity of the disease. They are increased from the normal number of about twenty in a minute to thirty, forty, or even more.
The rapid emaciation of the patient is a remarkable symptom. In a few days he is hardly recognizable. The eruption becomes changed, the cheeks are sunken, and the eyeballs protruding.

The pulse at first rather varies in character; it is generally full and rapid, never under 100. Afterwards it becomes irregular, small, threadlike, and of increased rapidity.

The tongue becomes florid and dry, and, finally, with the teeth and gums, becomes encrusted with the black deposit which characterizes typhoid fever. The words are few, and utterance rapid; and the breath has occasionally a preternatural smell.

The patient's feebleness is extreme, when he is visited by addressing him he answers properly but with effort and hardiness. Though he seems in general unconscious of all that is going on around him, he lacks no interest in anything and is almost in a state of stupor, when interrogated. He does not complain of any pain, he has no idea that he is so very ill. And though he indulge in no languid hope of recovery, he is incapable of entertaining the idea of the near approach of inevitable death. "Enfin," Saece graphically
days, the malade de la pique que d'un malaise général, et d'une sorte d'accablement dont il ne peut rendre compte. Il est sombre, agité et interrompu, ou remplacé par un fatiguant palpiter. Dentalium is common during the night. The skin assumes a leathery or yellow colour which Mareschal attributes to the deposit of pus in the auricular tissue, an opinion resting on no evidence. Meanwhile the surface of the wound becomes dry or is covered with fetid oozings pus. It is no longer painful, vital action seeming to have ceased in it; the granulations become soft and pale. If it has been an amputation the bone appears of a gray character and dry, the peristome being often detached, and the bone denuded. The patient now often complains of severe articular pain, and of the impossibility of moving the affected joint. The slightest pressure, or the gentlest attempt at flexion or extension, provoke cries of agony. A blush of redness may be seen in the neighborhood of the wrist. Muscular abscesses form in the neck, the calf of the leg, or somewhere in the stump.
If life still holds out, the abdomen becomes tympanitic and painful. Symptoms of a serous nature are referred to the chest as their seat, and mucous rales may be heard on auscultation. The patient is harassed with a short and painful cough. The tongue trembles. The words are confused. His lips are agitated with convulsive movements, an eruption of petechiae appear on the skin. There is subcutaneous tenderness, retention of urine, paralysis, and sometimes opacity of the Cornea and purulent Conjunctiva, vomiting, diarrhea, delirium, death.

Among the fatal diatheses which may attack a patient after an operation, or a severe injury, there are two causes of death which must be distinguished from secondary fever, viz., death from shock, and death from hemorrhage. A shock of more or less severity, according to the intensity of the cause, follows every operation. It may pass off in a few hours or terminate fatally in as many minutes. When the shock is the diathesis, it is to be rare as its occasion, causes alarm. The symptoms chiefly are: feebleness, shewness or irregularity of the pulse; acid of the breath; chill, slow or irregular respiration, coldness and pallor.
of the face, general surface, and extremities, with a general tumefaction and cold perspiration; a distressing feeling of sinking and anxiety, mental alarm and restlessness; a terrified, and blank state of the countenance; incoherence of delirium; a peculiar quivering of the injured limb; perhaps vomiting or drowsiness; terminating by loss of pulse at the extremities, or in the Carotids, and an extinction of sensation, of the heart’s action, and of respiration.

In the haemorrhage is the distinguished by the cause; a sudden or more gradual loss of blood. If the haemorrhage is sudden diastolic the impression made on the brain by the sudden diminution of pressure reacts on the heart after the manner of a Conception. When the haemorrhage is very gradual, all the indications of failure of the circulation come on viz. feebleness of muscular action, paleness and collapse, of the countenance, dimness of vision, vertigo, dilated pupils, a slow weak irregular pulse, coldness beginning at the extremities, coldness in the face, perhaps nausea, the breathing becoming irregular, sighing at once at the last breathing and gaping, while the intellect and senses remain unimpaired. This but a short time before dissolution.
It is needful to establish any differential diagnosis between this affection and internal inflammations, such as pleurisy, pneumonia, phlebitis and for it is characteristic of surgical fever to leave on the dead subject evidence of recent acute inflammation in one or in several of the internal surfaces or organs of the body, nor between it and other fevers, for it is essentially fever, a division of that order, with a uniform and evident exciting cause. But it must be distinguished from intermittent or typhoid fever by the characters that are laid down, and it can only be confounded with an acute local inflammation from too much attention being paid to the characters of a local morbid action, which will be found to be a sequence rather than a cause of the general disease. The cause is to be found in a general disease of the blood produced by the inoculation of some morbid material, from whatever source it may come, which creating fever, has a decided tendency to create also acute inflammatory action in one or more limbs at a distance from the original wound.
Prognosis and treatment.

There is no difficulty or room for doubt in the prognosis, the disease when clearly developed, and recognizable is fatal. There is indeed always a slight amount of fever following an operation depending upon the reaction from the shock to the nervous elements, the general commotion, caused by the nourishment which formerly went to the removed part being sent back to be assimilated by the other organs, and the removal of an member which probably before was a drain upon the system at large. In such cases the circulation is more vigorous, the face flushed, the tongue furred, diarrhoea and diaphoresis present. This may keep off or develop into the graver malady. It can only be treated by whatever means are indicated.

It may perhaps be going too far to say that whenever a patient has a rigor after an operation he will die, for a local suppuration, independent of any other complaint may be the cause of that, but
a rigor is a very grave symptom, and may justify an unfavourable prognosis. Treatment of the disease is in vain, it must be confined to the combating of symptoms. Iron, tincture of quinine etc. have been all given. Medicines that act directly on the blood, as citric acid does in scurvy, may have a better chance of success. Large quantities of wine are indicated to support the patient's sinking strength.

The cause of some causes which exercise a predisposing effect upon this kind of fever.

Chiefly atmosphere. Nothing is more necessary to health than plenty of pure air, and nothing predisposes more to disease than breathing a contaminated atmosphere. Every patient requires nearly a thousand cubic feet of air, and where he is obliged to live in an apartment with a smaller supply his health will suffer. A foul air may be generated by the crowding of many into a small space, even when they are all in health, how much more to aid when they are diseased? Or by the presence of only a few in the same apartment, if their ailments are attended by copious discharges. It often happens, in midwifery practice,
that symptoms appear, as a hot skin, quick pulse, dry tongue, perspirations etc., perhaps even a slight rigor, may suddenly occur, solely from the bed-curtains being closed, the emanations from the locional discharge contaminating the enclosed air, which, being enclosed by the curtains as prevented from circulating through the apartment. Hencever, this is remedied the patient recovers. While, were this cause not removed, these symptoms might end in fatal pernicious fever. A still malignant state of the atmosphere predisposes to the disease; it is more common in quiet sultry summer weather than in winter, or during the prevalence of high winds. A bad condition of the drainage in the neighborhood is another cause. Before the removal of a cesspool near the Strasburg hospital, few operations patients recovered. Since that source of stagnation has been removed, the reverse has been the case. The suits from imperfect supply of air are treated in two ways: it introduces miasmatic effluvia into the system, and prevent the elimination of the substances which are undergoing decomposition within the system, thereby confining the putrescent effluvia.
Which should he given off as such from the lungs and skin, which will produce the same effect upon the individuals habitually exposed to them as if they were generated from some external cause. The effects of confinement in a close atmosphere in producing disease is so well understood, and is clearly proved by the reports of sanitary commissioners that it is needless to adduce evidence to confirm the fact. Out of 123 survived, that fearful sight of imprisonment in the black hole of Calcutta, and to what a more terrible extent may this cause he allowed to operate among patients who have just undergone an operation or survived an injury, when that great exciting cause is taken into account with the other concomitant circumstances which all tend to render their situation one of painful anxiety, allied to a bad air habit, under the head of predisposing causes. Let us introduce into the system, decomposing matter that has been generated in some external source, or may place putrescent food and water that has been contaminated by the addition of decomposing materials.
Intemperance holds a high rank in predisposing to this and almost every other disorder. It not only lends to induce general disorder of the nutritive processes, and weakening of the vital powers, but according to Dr. Carpenter has a more direct and special action. One of the consequences of the introduction of alcohol into the blood, is its rapid oxidation, whereby it is itself eliminated from the circulating fluid; but in thus appropriating to itself the oxygen which the respiration procures supplies, it prevents the oxidation of the substances, which it is the one of the objects of that process to get rid of, thus tending to produce the same condition of the blood which obstructed respiration does. In India, fever, cholera, dysentery &c. is peculiarly apt to attack the intemperate and are very severe and fatal among those attacked. The morabity in an intemperate regiment has been estimated at 67 per 1000 alone, a temperate company in the same climate and with the same accommodations the increased mortality being clearly attributable to the effects of alcoholic excess.
Let us classify these causes: air vitiated by miasmata, putrescent food and drink introduced into the system, accompanying matter generated in some external source. Alcohol, putrid weather, and an inefficient supply of air obstruct the elimination of the accompanying matter generated within the system, or abnormally introduced from without. How any one of these causes will tend to produce an accumulation of diselegating azotized compounds, in a state of change, in the circulating fluid, and if they act together the effect produced is infinitely appalling. Now, if an individual with his blood in such a condition be exposed to the poison of cholera or dysentery or fever we well know that the result of such a combination are fearful. In the present case he becomes exposed to the shock of an operation and a suppuration which introduces directly or indirectly the product of suppuration into the system which were the predisposing causes would be innocuous, but with these that in addition causes a fatal disease.
The constitution etc. of the patient demands a few words. The young support operations better than adults, and recover sooner. Old age is a contraindication to any operative proceeding if it can possibly be avoided. People of a good constitution but who have been exhausted by a protracted suppuration, severe illness, or by the old standing of the disease that requires surgical interference have more chance of recovery than others who require an operation after a compound fracture, a severe accident, or a gun shot wound. Even when suppuration is far advanced and hectic set in with nocturnal perspiration and its other symptoms if an operation is performed the exciting cause of all these diseases removed, and another action commenced on their system such patients generally make marvelous recoveries. For the operation is performed on an emaciated and atrophied member, an unhealthy lesion is converted into one which may take on healthy action and the cut surfaces being of reduced vital energy their section produces little local or general irritation. But if such a
fever is accompanied by any tendency to the deposition of tubercles a fatal issue is inevitable. A strong healthy man who has met with an injury requiring amputation, say a severe railway accident, has a greater chance of surviving under the double shock to the system than one exhausted by a chronic local disease who has long made up his mind to look forward to an operation as his only deliverance from long continued suffering. In this hospital there are not more than four or five primary amputations of the thigh that have been successful during the last fifteen years. But another element has to be considered in such cases. The patient meets with an accident in the country, he is brought to town by some rough journeying conveyance, time is lost, the period of reaction is spent and when he comes to the knife he is in a state of physical and mental exhaustion. He would have a better chance were the surgeon to go to him, operate if need be in the field or at the roadside and then convey him to where he could be treated and attended to.
But even in the most favorable circumstances, a primary amputation is less safe than a secondary. A patient should be brought of necessity, by the chill and kindness of the surgeon, to make up his mind to the necessity for an operation. He should not be content with a mere trival submission and resolution to meet what is inevitable, his mind must be fortified not by a cold and desperate firmness to sustain because he cannot help it a grievous loss, but the circumstances of his case should be calmly laid before him, the necessity for the proceeding should be maintained by argument and appeal to himself, and he should be brought to give the consent of his will and of his heart with the whole matter should be laid clearly before, its dangers and disadvantages placed in a more favorable light than he is disposed at first feeling, and his health and the immunity from suffering after the danger is over expatiated upon with confidence and hope. He should be trained to look forward to the operation, not as an evil, but as a great gain, as an event
I have met with satisfaction and pleasure. For when the disease or accident has produced a general depression of the nervous system, when the patient is in a state of indifference and stupor. In this position when he appears neither to fear nor dread the amputation which is proposed. When he is in a state of mental apathy and physical depression hopes that he may have really are small indeed.

The constitution of the patient is a matter of great consideration. When there are the slightest symptoms of disease of the chest or abdomen surgical fever is sure to supervene, he should be in a state of perfect health at the time, even a foul tongue should be a sign that means of relief should first be tried to get rid of that. The kidneys should be particularly examined.

In 1831 fatal cases of surgical fever recorded by De Cheneus as having occurred at Guy's Hospital. The kidneys were observed to be in a state of marked disease in 72 cases. In 24 cases the appearances of the Kidneys were not mentioned from the autopsy being partial.
and in only 26 were they found healthy. Mr. Key observes that he has scarcely ever seen a fatal case of lithotomy in which there was not discovered organic disease of some of the abdominal visceras, and more especially of the kidneys. There can be no doubt that the success of an operation depends as much upon the state of the constitution of the patient at the time as upon any internal unhealthy agent. There is a large class of people in whom encephalitis, constant exposure to extreme changes of temperature, and perhaps syphilis, have produced such generally diseased condition of the system that its powers of repair after injury have become almost entirely destroyed. When such persons come under the necessity of a surgical operation, or open injury, traumatic fever with local internal inflammation is sure to supervene. There is no doubt that this disease can be propagated by contagion. The cause it is not uncommon to hear of instances of rapid decease following fevers.
Cases and disasters in the practice of the same surgeon, while others in the same locality had their patients recovering as usual. This fact is certainly true in respect to the analogous disease fever which has been proved beyond the possibility of a month the communicable by the practitioner. Accident revealed this fact in regard to Childbed fever, and as Surgical fever is so similar to that affection, it is very unlikely that the question experiment of its transmission by contagion will ever be tried.

Various accidental circumstances may come to be preseiving causes of Surgical Fever as they would many other diseases, which admit no clariification. As for example in age of fever or cold, long continued, repeated evacuations, deppeparing pains, previous debilitating disease, excessive exertion mental or physical, want of sleep etc. etc.

We proceed to recap and report this subject.
The direct injection of pus into the lower animals has produced a series of symptoms during life, and of lesions after death, analogous to those of surgical cases. This is a subject upon which some difference of opinion still exists, experimenters having arrived at considerable diversity of opinion. But the apparent contradictions in these experiments appear to me to be satisfactorily accounted for in the differences in quantity and in quality of the injected fluid. For instance, small quantities of healthy pus can be safely injected into a body, while a larger quantity, or successive injections of small quantities or a small quantity of putrid pus, will cause death. Cathelineau and Decret injected 15 grains of pus into the saphena vent of a small dog, and 80 grains with another, without worse results than slight rigor, vomiting, refusal of food, and symptoms of sickness, lasting only for a few hours. Leblottier injected a drachm (English) of pus into four different dogs, producing only in all of them rigor, loss of appetite,
alvine evacuations, thirst, emaciation, and general malaise. They were all restored to health in a day or two in one case he injected half an ounce of mouldable pus into a dog. After the operation the animal became very weak, the respiration was accelerated, the tongue hung out of his mouth, his eye was brilliant, respiration much laboured and intermittent refused his food and drink and seemed about to expire. Next day he was better and had an intense thirst which made him drink continually. He recovered completely in three days the only trace of the experiment being his excessive emaciation. In another dog he injected six drachms of good pus with similar and even more intense symptoms of emaciation produced in the animal which also recovered though similarly emaciated. The Physiological Society of Edinburgh injected 7 oz. of pus on two separate occasions into a monkey without observing any constitutional effects.
But the case is different when the injections are frequently repeated. Serrotot injected 2 drachms into a dog which had had one injected some time before death occurred in 8 hours. Again he injected 1 dr. into one mls which a attaching chyle had formerly been thrown in death occurred in 3 hours. In a third case in which he injected first 8 1/2 drachms new in 20 hours afterwards 1 1/2 or the animal died in ten minutes after the second. When the pus is unhealthy death occurs sooner and is caused by a small quantity of matter. He injected a drachm of the pus into a dog which only rallied after a most severe attack. In another case two drachms killed in an hour one dr. and a half in 5 hours, 2 drs in 8 hours, one drachm killed a fifth in 8 hours, and so on. A drachm of pus taken from an abscess in the lungs of a man three days after pyaemia killed another dog within 10 hours.
The symptoms these animals labour under were very analogous to those presented by the sufferers from Surgical Fever, they were: rigors. This symptom is the most constant of all others. In one half of the cases it is unceasing as having occurred and been the first sign of disease. In his other cases he deemed it have taken for granted its presence as there is no distinct mention of its occurrence. In a smaller proportion its absence is noted, or perhaps its presence escaped observation. The rigor was generally repeated once or oftener soon after the injection had been practiced. Ceasing as the animal either recovered its health or appeared dying. It appeared from a few minutes to a few hours after the experiment, in slight cases passing off quickly in its more lasting at intervals during many hours. The longer the thinning lasted, the more severe were their nature and the more grave the result. Generally the whole body trembled, sometimes only the upper or lower extremities.
Accelerated respiration was constant in all the cases that died, and absent in all the seven that recovered. With this was often combined tumultuous action of the heart and a quick pulse. In the worst cases the respiration and pulse were not only quicker than natural but also irregular.

Vomiting was a very constant symptom in the experiments of the French Academy, but Rediololet records no cases of this symptom. This is never seen in the surgical practice of patients, but Castelnaud Brueeet explain this by the particular acception which dogs have to vomit. They observed the animals making great efforts to vomit as if to get quit of some mordid material they had swallowed, and they were observed to drink water, and then endeavor to vomit it up.

Frequent alvine evacuations was a common symptom. The stools were liquid, frequent and in small quantity, but never very fluid. In the animals killed by successive injections they were constant to death.
The emission of urine was not so frequent as the alvive evacuations. The appetite varied. Sometimes the animals refused all food and drink, sometimes eating or drinking. The thirst was in general very intense. The dogs drank every moment till their death. Extreme weakness was observed in all that lived long enough between the experiment and their death. When that time was reached the usual effects of shock were a sign of decomposition. Great emaciation was observed in all that recovered from even a small injection of this fluid. Many lived more than twenty-four hours after the operation. Sedellot also observes convulsions, jawing, paralysis of the lower extremities, tongue protruding, violent spasm, etc., as being present in some, but in all of those experiments.

The symptoms I have just mentioned as occurring immediately after the injection of pus are analogous to those occurring in a patient suffering
from surgical fever, the operation, the rigor, accelerated, irregular respiration, petechiae, emaciation, etc. observed in both cases are symptoms of one and the same malady.

The pathological appearances presented by a patient who have died of surgical fever are similar in almost every case; viz. the formation of abscesses in a part of the body at a distance from the suppurring wound, which was regarded by the ancient authors as a product of embolism of the transport of purulent matter, hence named embolastic abscesses. They are found in the lungs, liver, spleen, brain, heart, kidneys, cellular tissue, joints, and the substance of the muscles. The lung is the viscera which is ordinarily affected, most extensively either along with or independently of other viscera. They generally appear in considerable quantity, a solitary one being seldom or never observed. It is more convenient to describe them as they occur in the different
1. In the lungs. They are generally found at the base and superficial layers. They are of various dimensions, from a mullet seed to a walnut, scattered through the tissue of the lung and separated from each other by healthy tissue. When operative they resemble wound granulations, when larger they become angular and irregular. Extravasated blood seems to be the first element in their formation when the spot appears of a dark rich red or brownish red colour, firm though fragile, and can be distinguished by its sharply defined outline and apparently homogeneous structure from the surrounding tissue. A small black spot then appears and extends, succeeded by a few gray points which gradually spread until the whole spot is infiltrated with pus, being soon connected with a true abscess which advances from the centre towards the circumference. Dance says we must admit three degrees in their development; the first consisting of a small circumscribed infiltration, in
The midst of which we often find one or more small receptacles filled of pus; the second in the formation of the hard blackish more then becoming white, and the last in its softening and conversion into a purulent focus, first in the centre then in the whole circumference of the engorgement.

This is the description of tubercles in the lungs which may be taken as the type of secondary deposits in other organs. As they occur mostly superficially they are less apt to excite secondary phlegm from the inflammatory action that their presence excites in the liver. They were first observed in this organ after wounds of the head which gave rise to the idea that their most common site was here. They form in the same manner as those in the lung and are more easily recognized. They are generally of a less rounded and circular eroded form than those of the lungs and resemble more irregular masses than small tubercles. Some
unable to corroborate the generally received opinion that they occur in the liver
most frequently after wounds of the lower
extremities and operations about the anus.
It is probably true that in most instances
where they occur in the liver they can
also be found in the lungs.
2. Abscesses in the kidney are the next
in frequency. The urine in such cases is
albuminurous. They call for no special
remark, neither do permanent deposits in
other organs, or those found externally.
These are the lesions of surgical fever
patients, and the very same appearances
are observed in animals which have died
after the injection of pus into the blood.
When the disease lasted long enough the
metastatic abscesses were completely formed.
Then the animals died shortly after the
operation. The lesions which characterize
the first phases of these formations, called
for want of a better name, coagulomata,
were present. Ledillot found that the
incipient change was begun in some cases
after four or five hours. When the
Animal lived, or was allowed to live, an intermediate time, the one lesion was seen 
paping into the other. As in man, the 

lungs were most frequently affected, then 
the liver and kidneys. The lungs were 
in very few cases that affected at all, 
though other organs were, a circumstance 
also known to occur in man.

From these repeated and careful 

experiments which have been made 
originally by Castelnaud and subsequently 
by other investigators the question is now 
definitely fixed and settled and admits 
of no dispute that the symptoms during 
life and lesions after death of the 
disease called by the various names of 
syphilitic, traumatic or irritative fever, 
pyemia, phlebitis, etc., are analogous to 
those produced in animals by the 
injection of pus into the circulation. These 
symptoms and pathological lesions are 
characteristic. They are found in another 
affection, they are peculiar & pathognomonic.
And when one finds the same symptoms and the same lesions in cases where one knows the cause that has produced them, we can refer the lesions of which we are in doubt about the cause to the same event that has produced similar effects. Thus therefore must some how get into the circulation, to have the disease called surgical fever induced there must first be a suppurring surface developed at some part of the economy. In an hospital accimated by pneumonia, its predisposing causes almost identical in each individual only there are affected those diseases are accompanied by the formation of pus. No conclusion of causes would this one could ever produce the disease. It could not arise from fumaria or intemperance or fatigue nor any other such agents combined. There must be an internal suppuration going on, a focus of disease which is spread through the whole system, the agent in the creation of the cause which will eventually proceed to fatal issue.
Pus may be supposed to enter the blood in various ways, but we cannot say in the present state of our knowledge which is certain. How alone it becomes mixed with the blood, we may not in the belief that there is but one way and no other, but being ignorant that that channel is one may advance more than one hypothesis, but that whether one may hit the right way or not there can be no doubt as to the fact that purulent matter enters the circulation. Pus may enter the blood by ulceration of the veins. The orificial action beginning in the cellular coat and penetrating into the vessel. In any part of the body an abscess may open into a vein in this manner and cause death by pyaemia.

So it is probable few may enter the circulation after an amputation. An abscess forms in the cavity of the wound, and the matter has no way to escape but by burrowing onto the nearest dermis which may happen like a vein.
pus may be absorbed through the open
months of veins which have been cut by
the knife of the operator. In many cases
where a stump has been dissected, the ori\ -
\ge of the veins were found gaping on the
surface of the wound, no clot having been
formed in their interior. The sides of the
veins had not adhered, their ori\ -
\ge were left open, and the pus having reached
exit through them found its way into the
circulation. The inspiratory process, which
aids the venous return, must also tend
to draw up morbid material from a
wound. It is said that the amount
of suppurating surface is so slight a
cause to produce the severe constitutional
effects of surgical fever, but the absorption
is a constant, uninterrupted process,
and suceedine injections of small
quantities of pus produced in dogs more
dense symptoms than even a large
quantity injected all at once.
The veins in the operative tissue may
often be the agents in disseminating
pus through the circulation. In injuries,
of the head it probably enters through the means of the aclipto. Then a long bone has been drawn through an annihilation of pus is often found in the spongy portion or in the medullary canal. In such cases the disease runs its course with great rapidity.

Surgical fever has occurred when no lesion was discoverable but a general inflammation of the lymphatics.

Now all these views hypothesis have been elaborately examined, investigated and, it appears to me, pretty satisfactorily refuted by authors as Lause, Berard, etc. who have laboured to establish phlebitis as the immediate cause of the presence of pus in the blood. It is a comparatively easy matter to follow in their steps, whereas if we find reason to reject the influence of their favourite agent we are left in the unsatisfactory position of being without a theory. We cannot overthrow this agent altogether, but we
May doubt if its influence is the constant cause, or if higher importance can be assigned to it than to the other causes. The cases of John Hunter, Arnott, Stewart, and others, where surgical fever with death from metastatic abscesses, followed a simple excision, in an apparently healthy individual, are the best proofs of the influence of phlebitis. Indeed, it is universally recognized to this lesion that the disease I am treating of has been hitherto known, under this name alone, and it is allowed that the product of venous inflammation is the pus, which is found in the fluid. Phlebitis, except in a few instances, is present, but the question is whether it is the proximate cause of the disease, or a secondary affection, which must be viewed only as an effect.

To determine this question Virchow and others have made experiments by ligaturing veins and observing the results at definite periods after the operation, and by chemical and mechanical
irritation of the lining membrane of veins. They arrived at the conclusion that if the precaution be taken to exclude the fluid from contact with the irritated lining membrane, it is difficult to excite even circumcised inflammation in it, and impossible to cause serious constitutional disturbance, whereas if the fluid is not excluded local and constitutional mischief can be with facility induced. MacKenzie who has repeated these experiments says that burns thus treated contained only some traces of fibrinous looking matter, having no resemblance to coagulated lymph, and evidently deposited upon rather than Raided from the vein, and he doubts if the deposit could ever be obstructed by that deposit. It has also been found that when inflammatory local action has been successfully induced, it fails to give rise to any obstructive obstruction which may be readily produced by diluting the blood by the injection of irritating fluids even in the absence of any injury to the veins.
Henry Lee, who has made many experiments upon this subject, is strongly of opinion that a change in the condition of the blood is the first step in phlebitis, irrespective of any action in the veins; and that it is an consequence of this change that the coats of the vessels become involved and take on increased action.

Local cirulation in the shape of ligature opends excites constitutional disturbance in proportion to the extent of outward wound. The morbid effects of ligature are slight thickening of the coats of the vein, and a loose,hack non adherent coagulum at the immediate spot of the ligature. In forty-eight hours there was increased opacity, thickening, and vascularity at the seat of ligature, and ulceration of the coats of the vein. In seventy-two hours the coats were nearly ulcerated through, and the vascular and thickening, both above and below the ligature became greater. In ninety-six hours the vein was completely divided by the ligature, the part above it was vascular infiltrated and swollen. It
Coagulation extended downwards which was slightly adherent to the lining membrane. A mechanical irritation of the lining membrane inflammation, localized to the seat of the experiment, thus in each case produced (McKenzie) In three cases there was complete absence of constitutional fever, therefore we may conclude that affection of the veins is not the proximate cause of the complaint. Neither is it an essential or surmounting lesion. It must only take an inferior part in the great general change acting on the system; it is only analogous to pleurisy, pneumonia, or arthritis or any other of the secondary inflammations peculiar to this kind of fever. All these secondary inflammations phenomena of an identical nature, often simultaneous in their origin, and their product when it can be clearly made out in a parenchymatous organ of the same appearance and character seen in the most remote part of the system must depend on some other cause which while it can work
a morbid action in the immediate neighborhood of the wound can also lead to deep deposits in organs remote from the seat of injury. We are again thrown back upon the primary lesion and we find the blood only causing phlebitis as it, from its somehow vitiated qualities, causes other 'demineralized inflammations.' Dr. Henry Lee who regards all the actions that ultimately lead to phlebitis as originating in the blood and being originally limited to this fluid, believes that all morbid agents received into the blood veins immediately produce coagulation of the blood, irrespective of any action of these elements that from the coagulum to formed lymph is spread and organized, in virtue of certain vital properties possessed by the blood, and that it is only in the course of the organization of such lymph that the defensive coats become engaged, and take on increased or inflammatory action. Dr. MacKenzie has made two kinds of experiments in relation to this point.
First, if the lining membrane of a vein is irritated, the blood having been previously excluded and subsequently readmitted, it will be found, after a time, to have coagulated throughout the entire length of the vein which has been irritated; and, secondly, that if an irritating injection be thrown into a vein, and the state of the blood and of the vein shortly afterwards examined, it will be found, not that the entire column of blood has been coagulated, but that portion only which had been in contact with its lining membrane. These facts show that this membrane when excited has the power of producing coagulation of the blood.

At this point we see experiments may be brought bear upon the question. These observations prove that the first effect of pus on the blood is to cause coagulation. The coagulated blood forms a shell around the pus globule.

The physiological society of Edinburgh deny that pus causes coagulation from their experiments upon a donkey.
But I am assured by a distinguished member of their Committee that he was
not at all convinced that Coagulation
had not taken place in a high extent.
The coagulated Blood forms a thick layer
round the pus globule. This is a
limiting process, an effort of nature
to prevent the damage which the
foreign body is about to do. If the pus
is in small quantity the vein becomes
clogged up, and the pus proceeds no
further. But if the quantity is large
the Coagulum is not only formed, but
there being none than enough for this
purpose no purulent matter enters the
general circulation and proceeds with
steady work. The fact that neither the
local irritation of the lining membrane
nor the clot never extend beyond the
outer point where the affected vein
reaches another larger vessel supports
this view, and leads us to believe
that in this case in a double sense
the Hunter's expression holds true that
"Coagulation is an operation of life".
Mr. Vesey experimented from hat blood coagulates when healthy pus is added to it, but he also found that accompanying putrid pus converts the blood into a thick, gumous, semi-fluid compound, and Mr. Millington concluded from his observations that putrid matters retard coagulation of the blood that, after death, the blood is often found fluid. Helder found that pus diminishes the amount of fibrine, and of the quantity he large it altogether disappears. Diminution of the quantity of fibrine, occurs chiefly in fevers arising from the presence of a poison in the system." (From Brown's H. 313.)

The older surgeons ascribed death from fever after a wound in battle to the arrow of the enemy having been poisoned. The next explanation was that pus is carried bodily into the system, red being deposited by the blood as pus, in the liver, lungs, etc. This microbicat sweep is undeniable. From the fact that the
The commencement, rise, and progress of a secondary abscess can be easily traced. The mechanical theory is that the pus becomes arrested in the capillaries, and there gives rise to inflammation and the formation of abscesses in the same manner as Cruickshier and Saunders proved that globules of mercury do. But, first, pus globules become disorganized before they get so far as either the lungs or any other capillary system. Pus globules cannot be distinguished from the white corpuscles of the blood which form readily enough, and thirdly, this theory may explain how abscesses form in the lungs, liver, kidneys etc. but not how they form in the joint, muscles or cellular tissues.

Much has yet to be learnt of the various pathological conditions the blood may assume. That the changes are in all cases when putrid matter is mixed with it requires a more refined investigation than Chemistry or Pathology have ever brought to bear upon the subject.
But the symptoms of changed blood can be recognised and are those of surgical fever viz.: decrements offensive; fluent perspiration; urine, stools fetid; bodies lose their vital cohesion and incipient contractility; face and features lose their vital animated hue, and become livid, nearly or quite a dirty pale tint; in some cases a brownish yellow; sometimes dotted with petechiae; often copious perspiration! Feculent habits from the lungs and decrements wholly altered: perspiration, strength, quickened respiration and circulation, hypochondral state and death.

(Copeland) These, symptomatics of diseased blood, are the exact signs and indications of surgical fever. This in this disease the blood alone that is involved. A great field is now open before us the pathology of the blood, its proper, its cure, questions retained for a revived humoralism, with all modern acids and appliances, boldly to
1. Surgical fever is an effect of the admission of the pus globule into the circulation.

2. In all cases of a large suppurating wound, pus probably gets into the circulation, but will not produce any bad effects unless aided by other causes which would, in any circumstances, cause a disease.

3. When pus mingles with perfectly healthy blood, its bad effects are counteracted by the blood coagulating spontaneously and coagulating where it is in contact with the irritated lining membrane if it has been involved in the injury.

4. The parts which local phlebitis and pernicious absorption respectively play in this disease are unsettled.

5. The origin of the disease is a vitiated condition of the blood.

6. The putrid pus globule seems to interfere with the natural process of coagulation.

7. The manner in which the blood is poisoned is still undetermined.
Cases and Observations

Case I. Mr. Richardson was admitted into the Surgical Hospital under Dr. Dunn's care, 1832. He suffered from retention of urine. He had had a stricture for many years which always caused him considerable pain and difficulty in passing water. He had had retention before. Various attempts had been made to pass an instrument into the bladder before admission which were attended by much loss of blood from the urethra. After the use of the warm bath, being put under chloroform, opium suppositories, etc., an instrument was put into the bladder by Dr. Spencer. He was free from pain and anxiety after his water was drawn off, slept well for some night, and had a good appetite. On the fourth day after admission he had a rigor followed by febrile symptom; pulse was rapid, always above 100, he could take no food, was restless and uneasy and physically much prostrated. He sunk into a state of much delirium and emaciation, had the delirium, first
At intervals during the night the patient continued to sneeze. The whole surface of the body became yellow. The cellular tissue in the region of the neck now became red, swollen, hot and painful. He experienced difficulty in swallowing and became dysphagia. Suction was made in the throat, one down to the trachea, with relief to the symptoms locally. On the sixth day a diffused exanthema blisters were observed on the left wrist and he complained of great pain there. He became constantly delirious; his features were pinched and anxious. On the tenth day after admission.

Inspection. The cellular tissue around the prostate was infiltrated with deep purulent matter. The fundus of the bladder was inflamed and deformed from pressure of a catheter which had partially perforated it. There were two false passages anterior to the bulb and a catheter passed in the dead body. More readily passed through one of these than it went the natural way. The lungs contained minute metastatic
abscopes in the earliest stage. Large quantities of pus were found in the cellular tissue in the urethra, which penetrating among the muscles, and collected in deposits of various sizes.

This is another of the numerous cases constantly occurring of the severe symptoms which may arise from mechanical irritation, and abrasion or penetration of the urethral lining membrane. The paping or bougie in many people occasions urges, frequent actions, and considerable constitutional disturbance even when no evil is done, but when the intervention of the machinism destroys a portion of the mucous lining membrane, the consequences may or may not lie in the urethra. This case according as the predisposing causes of surgical fever are present or not. A man in perfect health would suffer little from a false passage being clumsily made. But when the system has been irritated by previous retention pain, increased efforts to micturate, and
There, as almost always happens, alcohol had been taken in great abundance, these causes must operate in inducing the fatal disorder. The symptoms of the acute in this case were well marked there was no room for doubt, and all treatment was hopeless. There was more pus infiltrated among the external muscles than is common, and the secondary abscesses were in their earliest state. It is not easy to see how one part is the heat of a purulent deposit. And yet another, why the blood does not affect every tissue, and all equally. Is it that the vitality of that particular part is lowered which makes it more easily to prey to disease. I remember a new hose for a girl who subsequently had an attack of small pox and the blister were confluent on the renovate organ. Does this and similar facts bear on the latter point?
James Robertson set do a railway porter.

On 21st December 1853 the wheel of a railway engine passed over his right foot, at the time moment knocking him down thus causing a severe bruise of the left arm. The foot was removed by an inexperienced surgeon at the middle of the metatarsal bone, a few hours after the accident. The anterior flap was not properly placed, the enging having made a clean cut of the soft parts. Everything went on well for a week then on the right day Dec. 28 1/2 a small lump began to form in the anterior part of the thigh which gradually extended as far as the edge of the astragalus. In the mean time leeches by warm fomentation failed to subdue the inflammation in the arm and on the 30th incisions required to be made to evacuate the pus. He was admitted to the Hospital January 3rd, on admission an incision was made over the outer ankle for the discharge of pus which had extended in that direction.

On January 6 the remaining portion of the foot was removed at the ankle by Mr C...
Syden's operation & met lint applied to the stump to be renewed every Thursday, ordered wine and morphia. At the evening visit he was perspiring considerably. Pulse 120 full and soft.

Jan 3. Has slept well during the night. Still perspiring freely. Pulse 100 stronger. Tongue irritated. Has taken a little food. Considerable discharge from the arm.

7 ½ Pulse 120 full soft. Tongue very dry. The discharge from the arm slightly fetid. No pain.

9 ½ Had a rigor this morning. Pulse 130. Face pale and drunken. Appearance of the forearm healthy. ½ inch of the lower flap of the stump was clamped.

10 ½ Pulse 120. Has had 2 or 3 attacks of rigor today followed by profuse sweating. Discharge from both arm and stump rather fetid. He has suddenly become much emaciated.

Ordered large doses of wine, brandy, quinine, &c. Camphor mixture & morphia.

11 ½ Pulse 120 weak. Has had several severe attacks of shivering. After a rigor the face is flushed and the skin covered with sweat. The discharge both from arm and stump
Are intensely febrile today. Bowels continue lonely dry and red. Wounds of arm beginning to slough, discharge grey and discolored. The flaps are ununited and a portion of their margins has sloughed. His appetite still continues good. He never had vomiting. The patient lies in a dreamy unconscious state, indifferent to all around, but when spoken to he answers loudly in a loud clear voice. The conjunctivae are slightly yellow. Still he complains of no pain.

12½ fluid discharge from arm. Softening of flaps, which are still ununited has not extended. Lies sunk into the bed, unable and unwilling to move. Pulse 120—slightly...Religious at night. Face ope yellowish hue. Takes his food and drinks a great deal. He does not shiver or perspire how so much as he did. He is very much emaciated. Breathing slow and heavy.

13½ Selumin and opposite of treathing antimony, is increased—no change likewise—looking by degrees.

14 January 1953 he died.
Lectio Cadaveris 13 January. Flaps perfectly unoriented with a large quantity of free discharged pus between them. There was a large abscess at the bend of the elbow, the bone exposed, and the median basilic vein infiltrated through. Lungs, liver, kidneys, spleen all carefully examined and found without trace of disease. Vains of the leg, arm and abdomen carefully examined and found without the least inflammation or even congestion of their lining membrane. They contained no clot.

This was doubtless a distinct case of septic fever with all the symptoms of toxemia most marked. At the same time there was not a trace of any local inflammation neither in the veins, lungs, pleurae anywhere. Some surgeons would have given it the name of epidemic fever, but this is merely an meaningless term, the name of a disease which causes exactly the same symptoms during life, and the same results after death as an acquired, or artificially excited, state of irritation of the blood by
the introduction of pus or other noxious material into the circulation. The man died of the fever symptomatic of local inflammation for no local inflammation existed. The old doctrine of dyspepsia or metastasis or mechanical arrestment of pus just alike in here also at fault. There are six to look for the origin of this fatal fever but in a diseased or poisoned state of the blood. What this vitiated condition of the blood may specifically and actually consist of, whether in the presence of bone one or other of the elements of purulent matter alone; or whether other animal deceptions can cause it, we are perfectly apprised ignorant. In this case pus might readily have been absorbed if such a process is preliminary to the disease, both by the veins of the foot before and after the ankle joint operation, and by the open and ulcerated month of the veins at the bend of the arm. 

But cases of pyaemia during life with no change after death are not very uncommon. Ledebur reported one in the Gazette Medical for 1872. There are many others. 

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But cases of pyaemia during life with no change after death are not very uncommon. Ledebur reported one in the Gazette Medical for 1872. There are many others.
In all such cases we are shut up to the conclusion that the mottled state must be in the blood. In this case various circumstances aided the fatal issue. There was first the nature of the accident, being powered down and his foot crushed by an engine, that of itself was enough to give a great shock to the system. Then the anterior flap was not properly paired, an error which was certain to be followed by bleeding. Thirdly the bruise of the arm, going on to inflammation, suppuration and tuberculosis. Bleeding was in itself sufficient to cause great constitutional disturbances. Added to this he was of a feverish fretful disposition and was after he came into the Infirmary eight days after the accident, treated in No. 6 surgical ward under Somme-Rangi a ward notorious for unsuccessful operations, a ward in the low flat, overgrown partially arid, and where infection seems permanently to lurk and destroy. The usual symptoms of surgical fever were well marked, rigor, quick pulse, emaciation, unconscious condition, icteric hue of skin, slow and heavy
Breathing, delirium, sinking marked the deathly progress of the incurable disease. No man could here "treat lesions" for there were none, symptoms alone could be combated while the main disease, unchecked, advanced to its unhappy termination. It is characteristic of certain fever that no changes are found after death, and clinical fever as a division of that great class.

A combination of causes seemed to predispose to Robertson's malady, there was no one in particular, and it is doubtful if his medical attendant had been able to foresee the end of the case from its beginning, that any thing else could have been done to avert his death.
Charles Blake came in Sunday January 17th to have his male artery off, he had been drinking, and was in considerable pain. Two light structures were found one four inches from the orifice, another at the bulb. It was found impossible to introduce the catheter, as long time was spent in trying and about 1/2 quart blood was lost from the urethra. He was relieved by being kept for about an hour in the warm bath.

Next day had retention again relieved by the bath ordered opium retention quite relieved.

February 3rd The perineum opposite the bulb was found distended with urine, an incision was made and the finger passed in. In the afternoon he made water comfortably through the opening.

4½ p.m. passed a good night—feet around the incision and on the side of the lumbar hard.

5½ Hardness more marked—penis distended with fluid. The incision on the crown was enlarged and reopened. Penis divided in two places.

6½ Hardness round wound leg-Makes water then wound-Health halted good, skin cold, no pain.
Feb. 10 Two openings formed in the chest were enlarged and pus escaped; patient doing well. Being ready he got wine & good diet.

Feb. 14 As he had been doing well lately it was proposed to commence papier a catheter through the structure but not into the bladder. At evening visit he complained of pain in the left side. He then stated for the first time that he had had a slight rigor on the evening of the 13th two days before. The chest was examined and fine crepitation detected in a circumscribed portion of the base of the left lung. A few friction rales were found over the whole of the left chest. There was no dulness on percussion. Pulse small, weak, 120 - pain on the side remarkable tender. Leeches antitomening.

19th Slept a little during the night; Countenance pale dusky and anxious - Pulse 125 - Pain still on left side of the chest; Crepitation and friction sounds observed; Sputum large, bronchial rales. He has suddenly become extremely feeble, and died much within the last 24 hours.

20th. Conjunctivae slightly yellow - Breathing labored and accelerated. At intervals, two delirium but when slept to he was quite
Lisette, and answered rationally in a clear loud voice. Dr. Lee still said R. pain is dest better he complains of no severe symptoms but seems suffering from a general malaise.

With these febrile, pale and emaciated face before. Breathing deepened. Face has assumed a yellow hue. Complains of nothing. Delirium returns at shorter intervals and continues longer. Pulse above 120. Can still be curious to answer clearly. Such symptoms quickly increased in severity and at 7 a.m.

21st February 1853 he died.

Inspection six hours afterwards

The left pleura contained about a pint of reddish serum, having a quantity of lymph floating in it. There was lymph on both the Costal and pulmonary pleurae especially at the lower lobe. The left lung was collapsed and but slightly crepitant. At the external part of the lower lobe there was a cavity the size of a hen's egg filled with a dark diffusent and very fetid matter. It had no distinct lining membrane. Such a bore and connected with the upper part of this
Cavity. There was another somewhat smaller containing matter of the same quality lined by a distinct membrane. Both cavities approached each other within an inch of the surface of the lung, and the pleura over both wasopening a gangrenous character being dark and distinctly marked off from the surrounding tissue. Over the lower cavity the pleura had this character for a space two inches in diameter each way, and over the upper for a space one inch long by ½ broad. Internal to the upper cavity there was a third the size of a hazel nut.

Right lung, Kidneys, liver, spleen etc are healthy.

On laying open the urethra a light structure was found about four inches from the orifice and another about six, anterior to the latter. Behind both were large cavities each the size of a pigeon's egg both filled with putrid matter. They had both free external openings, the one in the perineum the other in the tectum. In the latter was found a sharp pointed calculus like an encrusted lemon seed lying in the midst of the pus. When the catheter was introduced, after papings through the cavity of the abscesses it ran
More readily down the side of the urethra than entered it, its walls being ulcerated through in both places where the abscesses surrounded it. There was no lining membrane round the abscesses, they were very irregular, penetrating in all directions and no matter they contained had not had free exit through the external openings connected with them.

In this case the symptoms of pleura pneumonia were so well marked and occurred so long after the catheterism, three weeks, that it was a matter of doubt whether or no the peculia of these traces of the lesions produced by purulent infiltration. In general they are no symptoms present which of themselves would lead the surgeon to believe that circumcised inflammatory action was going on in the lung. This fact is well known to all observers. But here there was acute pain in the side, aggravated by deep inspirations, and expectorations and
Friction rales heard on auscultation. The friction sounds were explained by the recent adhesions. The crepitation by the fluid in the pulmonary abscess. The crepitation was fine and the man rather surprised to find it not caused simply by pneumonia. The length of time between his admission and the development of the fatal symptoms also lead to the idea that the attack was one of purely idiopathic pneumonia. In some of Leddlet's experiments a few hours was sufficient to develop metastatic abscesses, and in practice symptoms of their presence arise from four to sixteen days after the operation. Moreover it was well known that the catheter had been very gently used so gently that false passages if they had been made at all must have been to a very small extent.

It is most probably that the abscesses had existed long before and had been caused by the passing of the calculi, that their presence...
impaired first the flow of urine, then the passage of the catheter, and that had he never been under treatment at all, they would have caused his death. If the abscess had been caused by false passages made by the catheter, there might have been one before the second structure, but none before the first through which a small catheter passed readily. Both purulent collection seem to have been related to the calculus passing from the bladder. There was a good deal of pus squeezed out of the abscesses around the abscesses. There was no trace of phlegm. The man had had retention before, and his constitution was ruined by Anasarca and Aspiration.

This was doubtless a case of purulent absorption differing from the type of such cases in the well marked inflammatory symptoms and in the formation of one large gangrenous abscess, instead of innumerable small abscesses. The formation of the abscesses required no other theory to explain it than that which has been given for the other form of purulent
Deposits by a poisoning of the blood. The same difficulties yet remain that pathologists have so lately undertaken. And why the deposits formed on a particular part of one organ rather than another else. The signs of putrefaction were well marked and recent adhesions were observed after death, but the crepitation of the air space of the left lung was supposed to depend on pneumonia not upon a gangrenous abscess. The fineness of the crepitation and the fact that the breath never had a fetid odour lead to the error. After the first acute symptoms had subsided the evidence of pyaemia became distinct. All the symptoms then became confirming of that disease. This case cannot be removed from the class surgical fever includes merely from the fact of there being only one large abscess instead of many small ones. The difference is only in Acute Retinal Rend.
William Marshall admitted Tuesday February 22, 1853
for amaurosis — a labourer aged 32.

States that some weeks ago he was
knocked down by a blow on the head which
rendered him insensible for a time. Since then he
has complained of gradual impairment of vision.
He walks with a peculiar uncertain gait, his
eyes have a vacant stare. Pupils are dilated
slightly projecting and he sees best in a dim
light. Both eyes appeared equally affected
and there was no unnatural appearance in
either. Tongue was furred. No great attention
was paid to him till the nurse reported that
on the night of the 21st he had been very
restless and uneasy. On the 23rd he was removed
to another ward and there the duty of going
reported that he moved his limbs heavily and
delayly, and was unable alone to find his way.
They put too bed he was observed to restless and
indisposed. He had a slight diarrhoea and
when he arose he got the closet he dragged his
limbs painfully along. At evening visit he
complained of pain in the left side and the
lower part of the abdomen. About 4 a.m. on the
morning of the 25th was summoned to draw
off his water which was done easily, an operation which required to be repeated every day till his death. The bladder was very full and the bladder water tinged with bile. It had been slightly delirious all that night, and was with great difficulty aspirated to the night before when he required it which was not very often. It lay in a sort of stupor all day. He was unable to rise but paced his chamber, apparently involuntarily in bed. He was very natural, rather feboid, but neither yellow nor bloody. Pulse full above 100. Tongue dry and white. Conjunctivae yellow.

9th This morning his skin was tinged yellow all over his body, completely jaundiced. His face was pale, thin and sunken and very yellow. Urine highly colored with bile. He had paped his natural but fluid stool in bed during the night. He lay in a stupor, but could be moved to answer questions. His limbs were completely paralyzed so that he could not move them but he had full power of his arms which he always kept wildly about in his restless repose. He complained of no pain.
The symptoms seeming to indicate jaundice with poisoning of the blood going on & coma from the non-elimination of bile he was removed to the Medical house under Dr Robertson. The following report is from the Medical Case Book. On admission it was JAUNDICE of SURFACE which was found to result from the yellow colour of the sweat & could be washed off. He had a mild restless demeanour, was impatient of being questioned, and had an evident painful perturbation of mind and body well described by the French word Maladie. Pupils were much dilated, and almost insensible to light, amaurosis almost complete, also retention of urine. He was unable to give an account of himself, but was alive to external impressions. On examination there was no pain or enlargement of the liver, abdomen nor lumbar region. Moist rales accompanied the respiratory Murmur, but no bulges or other signs of tuberculosis. Tongue dry & furred. Disappetite, but great thirst and almost constant vomiting or nausea. The matter
Fomitid was green at times, at other consisting merely of mucus. Urine dark red, turbid containing a few mucous corpuscles, with leukocytes, on reaction showed presence of albumen Eq. Gr. 1015. Shorts draped in bed of natural charcoal. Bowels mostly catheter; he was frequently freely purged. Pulse always about 120. He obtained little sleep even after large liquids. Never complained of pain. Became very rapidly emaciated, and died in days after admission.

Inspection. Lungs adherent to the opposite pleurys. At various points the grey hepatization, and at certain points small ulcers surrounded by purulent matter are seen.

Kidney full of purulent deposits. Collects in clusters forming large abscesses. Concretion and ulceration at the pyloric distention of the stomach. Ulcerated pustules were found in the ileum with abrasions in their center increasing in number as it approached the large intestine, and near
The termination of the ileum nearly the whole mucous membrane was destroyed and rough with parts in a strongly condition. The large intestine was hot to much affected except the rectum which was much affected. Around the anus there was a ring of enormous haemorrhoid which had been opened into by the surrounding ulceration and left open gaping.

This is a singular case. The usual symptoms of purulent abscession were decidedly present but there was no clue to this diagnosis. His appearance was exactly that of the other cases of gasmenia shane's been. The stupor, the jaundice and the palsy were the first noticed and most serious affections. In regard to the last symptom, it is not always detected in surgical cases from the patient being confined to bed, but in the experiments made on animals by the injection of pus it is a very constant and well marked symptom.
There were none of the symptoms just described during life, the abscess were of natural appearance and there was no diarrhea. That some hepatic affection was taking place was shown by the increased degree of bile, but the post-mortem showed the liver of natural appearance and consistency. The ameurosis is a symptom of leukaemia, as far as I can see, unnoticed.

The lesion in this case differed in no respect from what we have after an operation, viz., open, enlarged veins in the vicinity of an extensive ulcerating process. There was not the slightest disease of phlebitis. That hypothesis, therefore can we have to explain all the symptoms than that somehow pus got in contact with the blood they were open veins, or, perhaps rather, that the blood got into contact with the pus which produced such a change in it that a disease was created which affected the system and deposited in sundry organs metastatic abscesses.
Ehiro Graham aged 25. Has had symptoms of stone in the bladder for more than seven years. Lithotomy performed on February 24th 1883 and five stones removed. The operation was complicated by the patient having an old standing disease of the hip joint. The perineum was finished and deeper on one side than the other. For several hours after the operation the patient suffered a great deal, and when the urine passed out of the wound he was almost distracted. There severe symptoms soon passed away. 16th: Pulse 83 urine abundant, no pain except on the ached hip (the effect of burning at the operation.)
25th Much exhausted suffers from an undiscernible uneasiness. Pulse 120-130.
Tongue dry, brown - sleeps draught little. Skin hot, very restless, he roves about in bed and cannot remain in one position for more than a few minutes. He is pale, inhailed and emaciated. Pulse 170. Tongue brown, dry, restless and meaning. 28th Occasional delirium. Abdomen distended slightly.

March 2. Believed to be symptoms more severe. Pulse 130 - sunk into a stupor and died.

Friday March 3rd 1933

Post mortem 4th. Nearly a pint of seropurulent fluid in right pleura, with masses of a deep yellowish lymph and pus - two or three points of ulceration in the pleura palmaris connected with secondary abscesses of the lung. Both lungs presented on section a number of secondary abscesses in all their different stages. Heart, liver, spleen large but normal healthy. Kidneys full of abscesses of all ages and in all stages. The parts connected with the bladder were carefully examined by Dr. MacEnroe. The veins, lymphatics, etc., were all healthy. On squeezing the prostate some seropurulent matter escaped from.
In six months of rains. The internal wound was discharging and ununited. It is very difficult to see how death was caused in this case. One of the stones was impacted in a fold of the bladder and understood that death from surgical fever is more common in such cases. The man was in an unhealthy ward, where many cases are lost. His constitution was not very good, and the disease of the hip joint, under which he had labored for many years, and which impeded the performance of the operation and caused great pain and constitutional irritation afterwards, probably acted as a cause of the disease. But with a similar complication others have recovered. At all likelihood other causes were in operation which we hope to explain in each account.