

## **Report on pyaemia, and some allied affections / by Samuel Wilks.**

### **Contributors**

Wilks, Samuel, Sir, 1824-1911.  
Royal College of Surgeons of England

### **Publication/Creation**

[London] : [publisher not identified], [between 1870 and 1879?]

### **Persistent URL**

<https://wellcomecollection.org/works/dmzwcg5d>

### **Provider**

Royal College of Surgeons

### **License and attribution**

This material has been provided by This material has been provided by The Royal College of Surgeons of England. The original may be consulted at The Royal College of Surgeons of England. where the originals may be consulted. This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

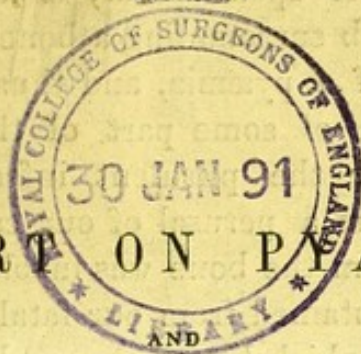
You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.



Wellcome Collection  
183 Euston Road  
London NW1 2BE UK  
T +44 (0)20 7611 8722  
E [library@wellcomecollection.org](mailto:library@wellcomecollection.org)  
<https://wellcomecollection.org>



5



## REPORT ON PYÆMIA,

### SOME ALLIED AFFECTIONS.

By SAMUEL WILKS, M.D.,

IN the present paper we have placed together all the cases of fatal pyæmia which have occurred in Guy's Hospital during the last eight years, and in which post-mortem examinations have been made. From the consideration of these cases we think some points of interest may arise. We do not wish to extract from them any positive statistical inferences relating to the frequency and to other particulars of the disease, which can be obtained only by its study in the surgical wards; but at the same time, in a report which is spread over a number of years, on a disease so commonly fatal, some proximity to a result in these respects may be obtained. Thus, if we never witness cases of pyæmia on our post-mortem table after some forms of injury, and constantly see them after others, we may draw a just inference that the disease is more likely to occur from the one than from the other. So, in looking through our cases, we find that the deaths may be placed in two or three sections, according to their cause, and that their frequency after some particular injuries or morbid processes cannot be too strongly contrasted with their rarity after others. Thus we seldom observe pyæmia after superficial injuries during the process of healing, or after wounds resulting from simple operations, as removal of the breast or herniotomy; whilst, on the other hand, a suppuration of the cellular tissue, whether



owing to an injury or spontaneous, is a very frequent cause. A cellulitis in a limb surrounding a bone is eminently effective in the production of a pyæmia, and thus it has been thought that the implication of some part of the osseous system is a favouring cause for the purulent infection. This is made highly probable from a perusal of our cases, which show that in about half of them the bone was involved. We think, then, that the results obtained from our fatal cases may bear comparison with those which have been made from a collection of all cases, including the living and the dead; for instance, the number of examples which we find in connection with amputation may well verify Mr. Bryant's facts that the cause of death in half of the cases of this operation is by pyæmia.

*Nature of the disease.*—The object of this paper being to examine some of the facts connected with the post-mortem appearances of the disease, we shall only briefly touch on its pathology. We may at once state our adhesion to the modern theory, that the elements of pus or some allied matters are introduced into the blood, which then induce similar inflammatory products elsewhere. The only difficulty we have in stating the theory in more precise terms is from the doubt we feel whether different authors have not made use of the expression pyæmia in very different senses, or at least in a very general sense on the one hand and a very restricted one on the other. There has been of late a prevailing opinion that the term should be used in a most comprehensive manner, and made to include blood-poisoning from various animal matters. We ourselves, however, believe the term to be well-framed, and one to be adopted only in those cases where purulent matter, or some of those elements associated or connected with it, infect the blood, and tend to produce similar purulent matters, or those elements which precede the formation of pus, elsewhere. If this be a correct method of regarding the disease, the term pyæmia has a tolerably definite meaning, and will exclude all those cases where the source of infection is not of the kind described, and the result not as just mentioned. We may refer, for example, to the case of fibrin entering the blood, which is thought by some to be a source of infection. Now, as far as our experience reaches, if this substance should enter the blood, or be formed by separation in the blood itself, a



similar coagulation or precipitation of fibrin may be induced in other regions of the circulating fluid, but not inflammatory products as pus, the result being of the same kind as the cause. Of this affection we shall hereafter give examples; for the present let it suffice to state our theory—that “like produces like,” and that pus, or those elements or germs which precede it, give rise to purulent deposits or inflammatory materials which are the earlier stages of the purulent process, and in the same way a fibrin in the blood gives rise to fibrinous effusions elsewhere; thus, probably, the whole process is in harmony with other instances of secondary deposits, as where, for example, the germs of a cancer-cell set up cancer-cells elsewhere, a melanosis of the eye propagates its black tumours through the body, or an osteoid tumour gives the starting-point for bony growths throughout the system. If this be true, the subject of pyæmia is brought back nearly to its original position, when pus was supposed to be carried into the blood and deposited in various parts of the body; if for pus be substituted the term *germs* of pus, we believe the theory to be substantially correct.

*Source of infection.*—The channel of infection is probably to be found in some vein or small vessel which has taken up the morbid matter; but the difficulty of proving that a vein must necessarily have been involved in the inflammatory process is the reason of the change of name from phlebitis to pyæmia. In the case where bone is diseased, it has been thought that the channels of infection are the Haversian canals; that these being permanently open, and incapable of closing like the ordinary blood-vessels, are peculiarly fitted to the absorption of the poisonous matter. It will be seen that in a majority of our cases of pyæmia the bone was involved, being, in the case of stumps, necrosed and involved in a suppurating or sloughing process; but in amputation it must be remembered likewise that the large trunks of veins have been severed. Next to the bone being the most frequent source of infection, is a diffused abscess in the cellular tissue or amongst the muscles of a limb. A well-defined abscess appears rarely to be a source of poisoning, or an abscess in the interior of the body, which is generally also circumscribed, such, for example, as hepatic abscess, which may probably exist for years, or an



empyema without any affection of the system. A diffused inflammatory process in the cellular tissue appears to be pre-eminently a source of infection of the blood, and if to such cause we add that of diseased bone, we include by far the larger number of cases of pyæmia which come under our notice. There can be no doubt that in these cases it is the unhealthy suppurating or sloughing wound which constitutes the source of the infection, and that it is the exception to have the blood contaminated by a healthy, healing surface. It cannot be overlooked that in very many cases of amputation there is a history of secondary hæmorrhage, but whether this be the cause or effect cannot be decided without having a very close and accurate history of each individual case; that is, whether, indeed, the hæmorrhage favour the absorption into the blood and non-healing process, or whether it do not itself indicate the first onset of a blood disease. As regards any external favouring cause for the production of pyæmia, the notion generally prevails that it is a disease of hospitals, due to a contagious influence existing in these establishments. That it is sometimes the scourge of hospitals when the latter are very impure, and that at other times, after cleansing and ventilation, the disease may cease, certainly corroborates the opinion, as well also as the fact that it may rage in one particular ward and not in another; on the other hand, however, when our institution is always well aired and patients well provided for, we should very much doubt the fact of a hospital patient being more susceptible to the affection than one in a private house; indeed, if we speak only of the habitations of the poor, we are confident that it is not a fact, and we need only refer to the cases under Series III to negative it. These cases are the very worst in the list, and yet in these the whole system was affected long before the patient entered the hospital walls. We can offer nothing more positive on this interesting subject, seeing how impossible it is to compare the practice of hospitals with the experience gained from a few isolated cases witnessed at private residences.

*Effects on the viscera, &c.*—The result of the introduction of such morbid materials of which we have been speaking into the circulating fluid is to cause it to coagulate either in the large vessels or in the capillary system of the viscera. This



effect, though we believe denied by some, we have always considered to be the most important fact in the whole process, and, indeed, this result, when witnessed in the congestion of various parts, we may sometimes look upon as almost characteristic of the affection. The first stage of the morbid condition which is produced in the viscera is a coagulation in the vessels, and the last stage is a suppuration. It was once believed that pus was actually carried to those distant parts where it was subsequently found, but this has been long known to be a fallacy, for not only may all the stages of inflammation be traced preparatory to the suppuration, but these may occur when the morbid material at the source of contagion has not itself arrived at the stage of pus. Thus, in the lungs, long before any purulent deposits are seen, all the various forms of hepatization may be traced. As might be expected from a morbid material being taken up into the blood, and circulating through the system until arriving at the capillary vessels, the morbid processes are widely diffused and various viscera affected; this scattered nature of the inflammatory deposits it is which is so characteristic of the affection. As the last stage is suppuration or sloughing of the part affected, so the first is congestion, and this we supposed was produced by the foreign element being carried into the blood, and there setting up a stagnation in the smaller vessels. In a lung, for example, we see numerous portions of congested tissue; these are groups of lobules supplied by certain twigs of the pulmonary artery in which this coagulation has occurred. Subsequently these congested spots are found to contain inflammatory products, and thus we have red hepatization, gray hepatization, suppuration, or sloughing. All these stages may be often seen in individual masses, exemplified by the affected portion of the lung containing purulent fluid in the centre, around this gray hepatization, then red hepatization, and, encircling all, a red margin of congestion. The same condition is seen in other organs, as the kidney, where all the stages of inflammation preceding the formation of pus may be observed, or (as in the lung) a purulent deposit, with inflammatory deposits and congestion around. In the liver, also, the same processes may be observed, and in the spleen the coagulating stage is particularly well marked in the production of firm masses of red tissue.



*Importance of congestive stage.*—The point of most practical interest connected with the process is, we think, to ascertain how far the first stage of congestion may be taken as evidence of the pyæmic condition and indicating the presence of a blood disease. This question is one of the greatest importance, as will be seen in considering one or two cases to be presently given, and the reason of this can be easily understood when it is remembered that pyæmia results generally from some inflammatory process on the surface of the body, and which may have been induced by injury, so that sometimes a question may arise between a natural and a violent death from the appearances of the internal organs. We have little doubt that, as a rule, a lobular congestion of the lungs (taking these organs as examples, as most usually affected) implies, in the absence of some few very evident causes, a poisoned state of the blood; it is thus seen in all those cases where we suppose the existence of a blood disease, and associated with it is generally an ecchymosis of the surface. And here, at the very onset, the question arises whether this ecchymosed or spotted condition of the viscera is due to the same cause. In purpura arising from any source we regard the spots as simple extravasations of blood, whereas in the disease under consideration we have spoken of the red patches and spots on the organs as due to congestion or stagnation in the blood-vessels. It would be desirable to ascertain in some cases how much of a particular red spot is due to congestion and how much to extravasation, but this is very difficult to do. We regard the question, however, as not of very much importance in the present affection, since, should the red spots on the pyæmic organs be due to either congestion or extravasation, there can be no doubt that the cause is to be found in the morbid state of the blood. Purpura is a term denoting a disease in which the cause of the affection is not evident, and therefore we adopt it as denoting a substantive affection, originating probably in the blood itself. The same condition, however, or a similar one, we know may arise from various causes, as from improper food, inducing scurvy; or in fevers of all kinds where the rashes become petechial; in artificial poisoning, as by arsenic, where ecchymoses have been met with on the endocardium and other parts; also in various visceral affections, as renal, hepatic, or



splenic, where a purpura is not uncommon. We regard, therefore, a purpuric condition as indicative of a blood disease, and therefore, if met with in conjunction with the congested state of organs before spoken of, the two appearances combined would be highly suggestive of pyæmia should it be a case where the suspicion is probable. In the case of congestion we suppose a morbid material has been carried into the capillaries, and there caused the stagnation, whilst in the simple purpura or ecchymosis we suppose that the blood is effused, owing to a failure of relationship between the tissues and the circulating fluid, the first change being in the blood itself. The practical distinction is, perhaps, not very great, seeing how often the two conditions are combined, as, for example, in the lungs of typhoid fever, where we see large patches of congested lung associated with actual extravasations, the one, indeed, being often the consequence of the other. Although, then, we regard a lobular congestion of the lung as the first stage of the pyæmic process indicating a blood disease, yet we look upon a mere ecchymosed condition of the organ as affording additional evidence of death by this affection.

The importance of this condition is gained from the fact, not only that it is found where the symptoms of pyæmia are well marked during life, but also where other undoubted results of this state are found after death. Thus, in Case 17, where the disease is well marked and one lung affected with abscess, the other showed merely congested lobules and spots of ecchymosis, and so in numerous other cases, as 77, 87, and 120. The point is equally important as regards other viscera, as the liver and spleen, although in these it may be more obscure; we think, however, that these patches of congestion in the liver do denote a blood disease, as in Cases 118, &c. In Case 82 this scientific point might have been made the basis of the whole inquiry respecting a fellow-creature's guilt of manslaughter or not. A sailor, after being severely beaten by his captain, died with great pulmonary obstruction, due in part to lobular congestion, and this, combined with the symptoms, led us to believe that it was due to the external injury. As, however, it was considered to be a question not wholly determined, the point was not mooted; but similar cases are constantly coming before us, and sometimes cannot be evaded.



*Death not due to the local disease.*—In the majority of cases of death by pyæmia sufficient local disease is found in the lungs or other parts to indicate the cause of death, but very often, and perhaps in the majority of cases, not sufficient to account for death through the instrumentality of the organs themselves. When, for instance, a few lobules of the lungs are inflamed, the fatal result cannot be accounted for, either from affection of the organs or constitutional disturbance resulting therefrom, and we must have recourse to the blood disease itself, and its effects on the system or nerves, to account for the event. If it be true that death may occur independently of the local disease and its effects, it is not difficult to understand how the same result may be brought about without the production of any visceral affection whatever; and we have no doubt that this is very often the case. If a patient, for example, have all the conditions necessary to produce the disease, and then all the symptoms of pyæmia set in with great violence, leading to a speedy death, we may probably expect to find no marked morbid changes in the body. In such a case it might be said that death was due to exhaustion or to shock, or to some such cause acting through the blood or the nerves; yet in the instance just mentioned, where the symptoms are well marked, we should not hesitate to pronounce death due to pyæmia. Such cases are seen at Nos. 8, 129, 27, 33, 39, 45, 51. Cases 73 and 85 were well-marked cases of pyæmia, and yet presented no post-mortem appearances.

If there be external abscesses on the surface of the body, the proof is present of the nature of the affection, although these cannot in themselves suffice to produce death; thus Case 76.

If the post-mortem appearances be none and there be no symptoms of pyæmia, then we must confess to a difficulty, and endeavour to balance the probabilities between this disease, exhaustion, or shock. (The two latter terms, however indefinite, we must still adopt in lieu of something better). Such doubtful cases are seen in Nos. 9, 11, 22, 30, 32, 36, 37, 46, 48, 75.

We do not see, indeed, why death should not be brought about sometimes by a combination of causes, and that a long-continued suppuration, leading to dissolution of life by



exhaustion, may not be associated with a poisoned condition of the blood of the pyæmic character. Such surmise may be made in Case 14 and some others.

*Symptoms of pyæmia.*—Although it was not our intention in this paper to say anything on this subject, yet as we have spoken of the importance of recognising the symptoms whereby, in association with the observations made after death, we may come to a conclusion as to the nature of the disease, we will briefly state the chief marks of the affection. When speaking of this matter to students in our own post-mortem room, we have been in the habit of defining pyæmia as typhoid fever occurring in a surgical ward, by which we have meant that if a patient labouring under some external wound or injury be seized with symptoms resembling those of typhoid fever, the probabilities are in favour of his being the subject of pyæmia, and the case should always be regarded with suspicion as one of this disease. For example, if a patient after an amputation fall into a febrile state, lose his appetite, have a brown tongue with red edges, and, moreover, have repeated rigors, we may be pretty confidently sure of the nature of the malady; indeed, the rigors alone are sufficiently alarming symptoms to every surgeon. To these may be added excessive prostration, pains in the joints, diarrhœa, sunken eye, and a sallowness of the skin. M. Roux, with other French surgeons, used to observe a peculiar odour of the breath; of this we speak with uncertainty. We are conscious of a very fetid odour in many diseases, and which the nurses are accustomed to style the smell of death, but we cannot detect any peculiar odour in pyæmia.<sup>1</sup> Should a patient with these symptoms die a few hours after their onset, as sometimes occurs when he is worn out by some long-standing disease, we should not hesitate to declare that death was due to pyæmia, although probably nothing might be found on examination of the body, or little beyond the ecchy-

<sup>1</sup> In reference to this question, we can only say "*de gustibus non disputandum*," and what one man's nose detects another will fail to discover. Thus, most persons appreciate fully the odour of the lying-in room, of smallpox, &c., &c., but some only will recognise the case of Bright's disease by a uriniferous smell, or with our own medical officer, Mr. Stocker, perceive hepatic disease by the peculiar breath. In a case of glanders we lately visited, the odour was different from that of any other morbid effluvium that we recollect.



posed condition of the organs before spoken of; and, indeed, when we remember with what violence the symptoms set in, and how often for many hours the patient hovers between life and death, and then rapidly recovers, we could scarcely expect that any serious local affection could have occurred in the mean time, even had the patient succumbed. We have, for example, been very often called to see a patient who, having some external wound on the body, has been seized with rigors and fallen into a state approaching collapse, with quick, feeble pulse, followed by slight febrile symptoms, and after these have endured for two or three days the patient has perfectly recovered. We cannot but think, in seeing such cases, that a sudden invasion of some deleterious matter has taken place into the blood, but being not in sufficient amount, or perhaps not of the peculiar fatal quality, has produced only a temporary effect on the system, and the blood has been soon cleansed through the lungs, by a diarrhœa, or some other means. If such attack should occur in another patient having less stamina we can imagine his succumbing to it at the very onset, and before sufficient time had elapsed for the disease to plant its seeds in the various organs, and thus no post-mortem appearances would be revealed. Such cases do, without doubt, constantly occur, and knowing this, it can be seen with what importance we regard such apparently insignificant conditions as a few congested lobules in the lungs or spots on its surface, and why also it is needful often to know the history of the case and the symptoms as observed during life.

*The lungs principally affected.*—It will be seen by a perusal of the cases that the lungs are the organs principally involved in pyæmia, and in the majority of cases the only parts visibly affected. It would seem, indeed, as if the infecting matter, being carried by the vein to the right side of the heart, is propelled directly to the lung, where the effects are produced, and, indeed, may then cease; but in other instances, which appear to be the exceptional cases, the matter may actually escape through the pulmonary tissue and show its effects in the system generally. A perusal of our cases would not absolutely warrant the conclusion that the lungs can never escape, since we have two or three cases which tend to show that the liver or other parts were first involved. But even in these it was



uncertain whether some other source of infection might not have been in operation, and thus produce another and more direct effect. With these cases before us, however few and exceptional they may be, we must hesitate before positively stating that the pyæmic process must necessarily first involve the lungs, since it does seem possible that the deleterious matter may pass through these organs with impunity, and then affect the other viscera. One important reason obliging us to admit this is the fact that external parts of the body, as the joints, may certainly be affected without the lungs. Why these last-named organs should especially be affected in the fatal cases we see from the fact that they constitute the first system of capillaries at which the morbid material arrives, and also because it is the function of these organs to take cognizance of such material in the blood and to purify it from its presence, whatever its source. However, the fact remains that the lungs are almost exclusively affected in a very large number of cases, if not, indeed, in the majority, and, moreover, if one or two cases be excepted, it may be said that no organ is affected without the lungs. In the exceptional cases it will be seen that the brain, liver, spleen, kidney, heart, &c., may be attacked. In conjunction with the pneumonia, we should state that there is often a considerable bronchitis.

*Heart.*—In several cases it will be seen that the heart has been affected by purulent deposits, and it will be noticed that this occurred only in the very worst forms of the disease, and especially where a diffused abscess in a limb had been the source of the mischief, as in Series III. Spots of ecchymoses are seen on the surface, and if these be carefully examined points of pus may be seen in the midst, or in some cases actual purulent deposits within the walls of the heart. These may burst and produce pericarditis. Not only on the surface, but within the heart itself, similar deposits may be found, and especially in the mitral columns. In one or two cases the coronary artery was found filled with softening coagulum or perhaps pus.

*Brain.*—It will be remarked how very seldom the brain is affected by secondary abscess; only in two or three cases amongst the large number here described.

*Kidneys.*—If these organs be affected, small purulent de-



posits, surrounded by a zone of congestion, are observed on the surface and throughout the cortical substance. We do not here allude to those cases where these organs were affected immediately from vesical disease.

Where the whole body is affected by pyæmia the liver and spleen may be involved through their arteries in the same manner as other organs, but it being remembered that these viscera have a circulation of their own, care should be taken that no especial source of infection in the portal blood be overlooked.

*Spleen.*—Instead of a number of small points of purulent formation, as in the preceding organs, a large mass of the spleen is generally affected. In the first place, from a stagnation of blood, a large, firm, solid mass is produced in the organ, contrasting strongly with the soft, pulpy condition of the healthy spleen. This, when incised, resembles a mass of coagulated blood, and in the next stage a mass of fibrin; afterwards the inflammatory deposits occur, terminating in suppuration. In one or two instances, where an abscess has existed in the base of the lung and immediately below it a similar abscess in the spleen, we have thought whether the inflammatory process may not have extended through the diaphragm, as in No. 20. It will be observed that in all our cases the spleen was affected in eight only.

*Liver.*—In this organ the abscesses are generally diffused over the surface and through the substance. It was formerly thought by some surgeons, as Dessault and others, that the liver was especially liable to be affected in cases of injury to the skull; that there was, indeed, some especial connection between these two organs. Modern experience has failed to confirm this opinion, although we should candidly state that a larger number of cases than here reported would be required positively to refute it. The explanation for so erroneous an opinion (if it be so), is to be found, probably, in the fact that half a century ago post-mortem examinations were rare occurrences, and when, indeed, performed were on those cases only which had interested the surgeon during life. Thus, cases of fracture of the skull which had been watched with care and had undergone operative means would not escape this investigation, whilst death after am-



putation would be ascribed to exhaustion or erysipelas. Thus, isolated facts have led, probably, to the error. We know, too, that these examinations were made in so slovenly a manner that the abdomen might be opened and the chest remain unexplored. It will be observed that amongst all our cases the liver was affected in fourteen, whilst only in three of these was the cranium the source of the infection. On the other hand, deaths from injury to the skull without such effects are almost of daily occurrence.

*Intestines.*—In alluding to the function of the lungs, of taking cognizance of these deleterious matters, we may refer to the diarrhœa which so constantly occurs. It is well known to those who are engaged amongst putrid substances that a diarrhœa may occur and the discharges have their peculiar odour. Moreover, experiments on animals of introducing decomposing matters into the blood have shown that intestinal discharges are produced; indeed, it has been considered by some physiologists that the purpose of the lower intestinal glands, as Peyer's and the solitary, is to remove effete matters from the system. Thus the reason why these parts are affected in typhoid fever, dysentery, &c., and that in artificial poisoning the upper part of the intestine may escape, whilst the lower may be inflamed or ulcerated. So in pyæmia, diarrhœa is known to occur as a symptom, although we are not aware that a morbid state of intestine has been hitherto observed. For many years past, however, we have noticed that the lower end of the ileum and the colon may be inflamed, the mucous membrane being covered with lymph or with firm, granular, coherent exudation. (See Cases 13, 48, &c.)

*Serous membranes.*—The older surgical writers spoke of the frequency of inflammation of the serous membranes, as pleurisy, after injuries and operations, and we ourselves have sometimes heard the same fact spoken of. It is true, no doubt, that these constantly occur, but it will be at once seen, from the view we have taken of pyæmia, how the fact is explained—that they are altogether secondary to the inflammation of the the viscus which the serous membrane covers.<sup>1</sup> We have

<sup>1</sup> We refer here only to serous inflammations the result of pyæmia, and not to those arising from other causes, as morbus Brighti, &c., which may be accidentally



said that the essential nature of the pyæmic process is the change in the capillaries of the various organs and tissues produced by the morbid material in the blood, and which subsequently leads to the ordinary inflammatory processes. An acute inflammation of a serous membrane can therefore scarcely be affected in a similar manner, and thus we believe that, whenever found inflamed, it is merely that portion which covers a previously affected organ. The proof lies in a very small compass; that the affection of the parenchymatous organs constantly occurs without the inflammation of the serous membranes, but never the contrary to this. We think the proposition is true, and if so, the conclusion is a correct one. For example, as regards pleurisy, in none of our cases does this exist without pneumonia, but constantly the latter without the former; and more than this, the serous inflammation commences on the affected portions of the lung, and is proportionate with them. Thus, a lung may present three or four masses of lobular pneumonia near the surface, and over these a patch of lymph is seen. If the disease is more extensive, or has arrived at the stage of abscess and then burst, a general pleurisy may have resulted. The same observations apply to the peritoneum—that wherever this membrane has been inflamed it has been due to previous suppuration in the liver or spleen. So, also, with the pericardium, it will be seen that pericarditis occurred only in those cases where suppuration had taken place in the walls of the heart and involved the serous membrane. To avoid any bias of opinion in the matter, we have selected from our books any cases which might appear to militate against this view, and thus, in Series XII, we have placed together Cases 134, 135, 136, of peritonitis. In these, however, there was no proof of pyæmia, the peritoneum being affected by a peculiar erysipelatous inflammation or by a contiguity of an inflammatory process in the abdominal walls, in some such method as was suggested as causing a splenic inflammation from influence of pulmonic abscess near it.

*Affections of the joints and secondary abscess.*—Secondary abscesses on the surface of the body are very frequent, and it will be observed that there appear to be favorite sites for them,

present. For the elucidation of such cases see the valuable paper published by Dr. Chevers in the 5th volume of the 1st series of these 'Reports.'



as on the front and upper part of the chest, the forearm, &c. As regards the joints, it will be noticed, on the perusal of the cases, that in those which were acute, and the course of the disease rapid, nothing was observable after death but increased effusion in the synovial membrane; whilst if the disease was more prolonged, the joints were filled with a dirty, purulent fluid, and in the course of a week or two disorganization would follow, together with softening and loosening of cartilages or necrosis of the ends of the bones. Our object in this paper is not to describe the various forms of pyæmia as witnessed during life, but our post-mortem cases show that in the acute forms the joints are but little involved, whilst in those of longer duration these parts are often quite disorganized. Now, since in the latter cases the vital organs could not be proportionately affected, it would follow that the joints would, in all probability, be attacked first, and this is certain in many cases from the very recent inflammation of the lungs which had set in to put a termination to the case. Our post-mortem room would thus corroborate the experience of the wards—that, apart from any more minute division of the diseases into varieties, there are two great classes of cases, the one acute and terminating in a few days with affection of the lungs or other vital organs, the other chronic, extending sometimes over several weeks, characterised by swelling of joints and external abscess, terminating in recovery, or if in death, by exhaustion or the sudden invasion of pneumonia, as in the first variety. We believe this to be a practical division of the disease into two forms which every man of experience would acknowledge.

*Vesicular or pustular eruption.*—On several occasions we have witnessed a rash, somewhat of the character of varicella, on the bodies of those who have died of pyæmia. In some cases of glanders we have lately witnessed and described in another article in the present volume we were struck with the resemblance which the pustules in that disease had to those which we have occasionally witnessed in the present affection. We would refer to Cases 104, 130, 131. Such an eruption is one evidence, looking at other analogous cases, of a poisoned state of the blood.

*Purpura.*—We have already spoken of the purpuric or ecchymosed condition of organs accompanying the pyæmic



process, but we should also state that a similar condition may occur on the surface of the body. It is, however, exceptional to find a general purpura covering the skin, and, therefore, when this occurs, some other cause has been looked for. In the absence of any such discovery, however, we must regard a general purpura as a symptom of the blood disease known as pyæmia; whether it be dependent on a secondary cause, as a suppuration of any of the abdominal viscera, and not directly on the pyæmic condition, may be a question open to further inquiry. The interest of the matter is in reference to those cases where the purpura was the most prominent symptom, and one of the first observed during life. (See 102, 112, and 106.)

In connection with this subject we may mention another evidence of the blood disease in the rapid decomposition of the bodies and the markings of the veins on the surface. Thus, before the body is scarcely cold, there may be sometimes seen the blue and red coursing of the veins, and the colouring which has exuded from them into the tissues.

*Yellow colour of the skin.*—A sallow colour of the skin is certainly a sign of pyæmia worthy of observation, and it is remarkable that this proceeds often to a complete jaundice. We had expected, in analysing our cases, that we should have been enabled to have thrown some light on the cause of the discoloration, or at least to discover whether it be due to the presence of bile and indicative of some hepatic affection or not; it will be seen, however, from our cases, how difficult it is to arrive at a conclusion on the subject. We think it cannot yet be admitted that yellowness of the skin necessarily, and in all cases, denotes hepatic disease, or even bile circulating in the system, since we know that in chlorosis, typhoid fever, pneumonia, and some other affections, this may constantly be observed without any proof of a biliary obstruction. The difficulty of supposing that the cause is due to bile lies in the fact that this secretion is a product of the liver itself, and is not to be found in the blood unless reabsorbed, owing to some obstruction to its flow from the organ. Now, no such cause of obstruction is observed in many cases where jaundice is a symptom of pyæmia. The want of discovery of such obstruction, however, would not be a decisive objection, since we often



witness considerable yellowness of the skin in heart disease and other affections where the organ is merely secondarily affected by congestion. Supposing, however, that no apparent disease of the liver exist, and jaundice be present, the case may come into the category of simple jaundice, a form of disease still open for investigation. Frerichs has surmised that the biliary acids, which in themselves are colourless, may undergo such a change in the blood that a yellow product may then result and produce jaundice. It may be, however, that in pyæmia no such obscure causes obtain to produce the effect, and that some morbid condition of the liver or its appendages really exists, and we say this because, although in some cases no hepatic disease was observable, yet in others a large abscess in the liver was present. It would be difficult, however ignorant we may be of the connection, to separate the fact of abscess in the liver, when it occurs, from the yellowness; therefore it is possible that in other and less severe cases of jaundice there may have been such an early condition of the pyæmic condition of the liver to escape notice, and yet be sufficient to produce the sallowness of the skin, especially as we know congestion is a cause sufficient for jaundice, and that the essential condition of the early pyæmic process is a congestion. The subject is still open for investigation, not only as regards this particular affection, but as to jaundice generally. In Cases 55, 56, 4, and 40, the jaundice is seen to be associated with abscess in the liver, whilst in 15, 16, and 19, no disease of this organ was observed.

*Simple lobar pneumonia as effect of pyæmia.*—Should it be admitted that an ordinary pneumonia is liable to occur from injury, we have lost the means of determining in every case whether the inflammation be the result of a wound or not. It will be seen that in several cases ordinary pneumonia is reported to have occurred after an injury, and the question has arisen whether this was due to the violence of the pyæmic process or arising from some other cause. In lobular pyæmic pneumonia, arising, as we have stated, from a coagulation in the pulmonary vessels, we do not consider that the vessel supplying the whole of the inflamed mass was necessarily involved in the first instance, but that the inflammation might have spread from the smallest focus; and if this be the case, we may ima-



gine a very large part of the organ to be involved before the fatal result takes place. This is evidently so from many cases recorded in the following list, where, on cutting through the lung, a lobular pneumonia was found affecting various parts, and having reached its latest stage whilst the intervening tissue had become more recently affected. Although the whole organ was inflamed, the degree of the process varied, the oldest being evidently lobular, or in a state of suppuration; such cases are seen at 35 and 124. The question which arises is this—whether the pyæmic process may affect the lung in such a manner that at a very early period the whole may become consolidated? Although this may be the case, our own experience would make us hesitate in considering any condition of lung pyæmic where the inflammation was not markedly lobular. The fact, however, of its frequent occurrence after injury cannot be ignored, and the explanation must be sought elsewhere. In such cases as 60,<sup>1</sup> where the skull was fractured, it is probable that an influence conveyed through the nervous system to the lungs may have caused their inflammation. The cause remains doubtful in such cases as 49, 78, 79, 71, and 109. In Case 59, where the sternum was fractured, the local injury might have been sufficient.

SERIES I.—*Pyæmia following injury to the bones or amputation.*

As the causes of pyæmia constitute the most practical point of interest in regard to the subject, we have thought it advisable to separate the cases as far as possible in reference to the circumstances which give rise to the disease. It will be seen that the examples in this series and in the following, where the bone was involved, constitute a very large proportion of all the cases here reported, and form the basis of the remarks before made. It may be also said that our object has been to collect together, not only the indisputable cases of pyæmia, but all which may possibly come under this designation; thus,

<sup>1</sup> In his lectures at the College of Surgeons, Mr. Hilton has suggested the probability of the sudden change in the relation of the vascular supply of organs as originating the inflammation; when a man, for example, in good health, is, from an injury, suddenly thrown on his back in perfect quietude.



in the following fifty-five cases there will be found nine in which true pyæmia is questionable, and to these we shall hereafter refer.

CASE 1.—*Compound fracture ; pyæmia.*

Wm. C—, æt. 32, received a compound fracture of the leg and fracture of the clavicle twenty-five days before his death.

*Post-mortem examination.*—The bones of leg exposed ; clavicle repairing ; abscess in thigh ; suppuration in sterno-clavicular joint ; veins of limb unaffected ; lungs covered with lymph and numerous lobules in state of suppuration.

CASE 2.—*Compound fracture ; pyæmia (?)*.

Charles S—, æt. 48, compound fracture of leg, followed by sloughing and inflammation in course of saphena vein ; on tenth day amputation of thigh, succeeded in two days by rigors, hiccup, great anxiety, diarrhœa, and all the symptoms of pyæmia ; at the same time there was much secondary hæmorrhage, and on following day he died.

*Post-mortem examination.*—Sero-purulent fluid in thigh ; veins healthy ; lungs healthy ; kidneys slightly degenerated.

CASE 3.—*Amputation ; pyæmia.*

Edwin E—, æt. 19, had leg amputated for chronic sore connected with talipes ; two days afterwards, stump painful and inflamed ; on the third day he had rigors ; on the fourth he was very ill, with fever and delirium ; on the sixth day an abscess formed on the opposite thigh. The lad then continued in a very low state, with much fever, and delirium, until he died on the fourteenth day.

*Post-mortem examination.*—Body of a decided yellow colour, the flaps of stump uniting, but abscess in the other leg had involved the knee-joint. Veins of leg appeared healthy ; purulent lobular pneumonia and pleurisy of both sides.

CASE 4.—*Injury to hand ; pyæmia.*

John W—, æt. 49, jammed his hand in a cask, lacerating the skin. He progressed favorably for sixteen days, when he had loss of appetite, headache, &c. ; on the next day rigors came on, and severe febrile symptoms ; the wound on hand did not have an unhealthy appearance ; on following day worse, vomiting, rigors, and much fever, tongue dry and furred. Two days afterwards he was seized with pain in the abdomen, and on the following morning he died, twenty-one days after the accident.

*Post-mortem examination.*—Body semi-jaundiced ; wound in hand rather sloughy, and metacarpal bone bare ; lobular, purulent pneumonia ; no pleurisy ; acute peritonitis, caused by rupture of small abscesses in the liver ; one was the size of an egg and the others were smaller ; the hepatic tissue around them red, soft, and contained inflammatory products ; portal vein contained pus ; kidneys had minute white points of commencing suppuration ; veins healthy.



CASE 14.—*Amputation ; pyæmia (?) ; exhaustion (?)*.

Benjamin G—, æt. 10. Ten days before admission he jumped out of a cart, but did not strike his leg to his knowledge. Two days, however, after the occurrence his leg began to swell, and on admission it was in a state of suppuration; the knee-joint subsequently became involved, so that the limb was amputated five days after admission; the stump began to slough and the bone to die, and the lad sank in eight days.

*Post-mortem examination.*—Lungs contained a number of lobules solidified by extreme congestion; in a few of them the tissue was soft and granular, indicative of an inflammatory process; no other morbid appearances in organs.

CASE 15.—*Amputation ; pyæmia.*

George H—, æt. 15, scalded his arm and leg with hot water; the skin sloughed on the leg, and the patient was sinking when, at the end of the seventh week, the leg was amputated. He still gradually got lower, and died twelve days afterwards.

*Post-mortem examination.*—Body wasted, skin bright yellow; stump sloughing and bone projecting; sores from burn on the arm; both lungs had lobular pneumonia, mostly in stage of gray hepatization; some softening, and almost broken through pleura, which was covered with patches of lymph. In the spleen was a hard mass where blood had coagulated, and this was adherent to the diaphragm exactly at the spot where the lung above was inflamed.

CASE 16.—*Injury to foot ; pyæmia.*

Charles O—, æt. 11. Severe laceration of the foot by a railway accident. He went on well for a fortnight, when symptoms of pyæmia came on, accompanied by pain and swelling of joints, especially the left elbow and shoulder.

*Post-mortem examination.*—Body of decided yellowish hue; lungs, lobular pneumonia in all stages, red and gray hepatization, and lobular congestion. Recent patches of lymph over the inflamed lobules; tubes full of mucus; one kidney contained a softening mass of fibrin. Left ankle-joint near the seat of injury was full of pus, also the left elbow- and shoulder-joints, as well as the right sterno-clavicular articulation.

CASE 17.—*Amputation ; pyæmia.*

Geo. W.—, æt. 66. Great toe crushed by piece of iron, which required amputation. A week afterwards absorbent inflammation occurred up the leg. This was subsiding when, six days afterwards, he was seized with rigors, which having continued many days, febrile symptoms set in, afterwards all the signs of pneumonia, and he died five days after the onset of the symptoms.

*Post-mortem examination.*—Suppuration about the injured part; veins of leg carefully examined, but found quite healthy, and all trace of absorbent inflammation had disappeared. Lungs.—Right in advanced stage of pneumonia, soft, sloughy, and having a very fetid odour. Pleura involved in the process, and covered with a



greenish lymph. Left lung much congested, and surface covered with purpuric spots.

### CASE 18.—*Diseased bone ; pyæmia.*

Henry S—, æt. 9. Admitted with caries of the ulna and abscess of the forearm. Afterwards suppuration occurred in the other joints, and subsequently on the cranium.

*Post-mortem examination.*—Necrosis of calvaria and abscess of brain connected with it.—Lungs. Lobular pneumonia in various stages, suppurating and sloughing ; lymph covering the surface.

### CASE 19.—*Amputation ; pyæmia.*

John C—, æt. 41. Seven weeks before admission he squeezed his hand between two beer barrels. On admission he had disease of bone, with sinuses. The fore-finger and head of metacarpal bone were removed. Secondary abscesses formed in the hand, arm, and afterwards the leg, and he died six weeks after the amputation.

*Post-mortem examination.*—Body extremely wasted (before the accident he had been very strong and stout) ; eyes sunken, and skin yellow.—Lungs. Lower lobe of right in state of red hepatization, the inflammation not uniform or of the same age, some lobules being red and others gray. Many parts soft, and exuding dirty coloured, purulent fluid. Liver fatty.

### CASE 20.—*Amputation ; pyæmia.*

James R—, æt. 24. A railway truck passed over his leg, necessitating immediate amputation of the thigh. The femoral vein was ligatured. He progressed favorably for a fortnight, when he began to sink, apparently from pyæmia, although the symptoms were not well marked.

*Post-mortem examination.*—Lungs affected by lobular pneumonia, some hepatized portions softening. These parts covered with lymph, and purulent serum in chest ; spleen had on its upper surface, immediately in contact with diaphragm, and opposite to the inflamed lung numerous deposits of lymph in substance of organ. Some approaching abscess. Stump partially healed. The vein at lower end contained pus ; above this it was healthy.

### CASE 21.—*Amputation ; pyæmia.*

Wm. H—, æt. 39. An engine passed over the left foot, necessitating amputation. Three days afterwards there was purulent, unhealthy discharge from the wound and much febrile disturbance, and in four days from this time he had rigors, and these continued, together with the formation of abscesses, until his death, five weeks after the accident. An abscess came in the calf of the right leg, another near elbow of right arm, and pain in the other joints. Subsequently the stump sloughed, the bone became necrosed, and he had considerable hæmorrhage.

*Post-mortem examination.*—The left lung had abscesses at the base of the lung, and which were adherent to the chest, so that when removed these were torn open, leaving a cavity in the tissue. Right lung had two masses of inflamed lung covered with lymph.



CASE 22.—*Fractured leg ; pyæmia (?) ; exhaustion (?)*

John V—, æt. 55. He was run over by a cab, which produced fracture of the thigh. The limb was placed in a straight splint, as usual, and on the following day the man had severe febrile disturbance and some shivering. The constitutional symptoms continued, and he daily became more feeble. On the sixth day, the leg having become much swollen, the splint was removed. It then rapidly increased in size and became discoloured, as if hæmorrhage had occurred within. On the ninth day he died.

*Post-mortem examination.*—The whole of muscles of thigh infiltrated with a pink-coloured, watery pus ; the blood-vessels healthy ; liver fatty, and, with this exception, all the organs healthy, there being no acute or old disease. (In this case there was a question whether death should have been referred to collapse or shock ; or whether, indeed, the blood had become infected, although no evidence to prove it.)

CASE 23.—*Compound fracture ; pyæmia.*

Robert C—, æt. 56. Received a compound fracture of the left leg. It became inflamed, and subsequently suppuration came on, which necessitated amputation on the seventh day. Sloughing and gangrene ensued, rigors came on, and death eight days after the operation.

*Post-mortem examination.*—Left lung had lower part in state of red hepatization. In this were two distinct masses exuding purulent fluid, and having the centre gangrenous.

CASE 24.—*Amputation ; pyæmia.*

Thomas G—, æt. 30. Six weeks before admission he had inflammation of the knee, which rapidly went on to involve the joint, so that after he had been in the hospital six weeks it was thought proper to amputate. The stump began to slough, with some hæmorrhage, and the patient was seized with sickness, &c.

*Post-mortem examination.*—Pulmonary artery filled with a firm clot, passing from right ventricle throughout the lung ; no disease of the lungs themselves. The liver contained five or six small abscesses, the size of a pea, on surface of liver.

CASE 25.—*Amputation ; pyæmia.*

James D—, æt. 37. Two weeks before admission his finger became inflamed and suppurated, without any apparent cause. On admission there was a large sore on the hand, and the bone exposed, which, not recovering itself, was amputated three weeks afterwards. He did not progress favorably, but continued weak and feeble, when, ten days after the operation, he had violent sickness, followed by pain up the arm and shoulder, with violent rigors. He sank into a febrile state, with oppression of breathing, and soon died.

*Post-mortem examination.*—Body. Yellowish aspect.—Lungs. The only evidence of disease in these organs was a lobular mass at the base of the right lung, in a state of gray hepatization, and two similar portions at base of left ; in one of the latter softening had commenced. The liver contained about one hundred small abscesses,



each the size of a marble, and occupying half the bulk of the organ. The arm presented no disease, but shoulder-joint contained a brown-coloured, purulent fluid.

CASE 26.—*Amputation ; pyæmia.*

John S—, æt. 32. Amputation for compound fracture of the leg. He did well for a week, the stump rapidly healing ; after this he sank into a febrile state, had rigors, and gradually sank, dying three weeks after the accident.

*Post-mortem examination.*—The stump healing, the bone slightly exposed, and of a dark colour. Abscesses throughout both lungs, and also lesser stages of lobular pneumonia. These parts covered with recent lymph.

CASE 27.—*Amputation ; pyæmia (?)*.

Sarah B—, æt. 24. Her thigh was amputated for elephantiasis, from which she had suffered all her life. She never rallied after the operation ; the stump became inflamed, and symptoms of pyæmia almost at once set in. The joints became painful, and death ensued on the fourth day.

*Post-mortem examination.*—Stump sloughy ; nothing observed in the vessels of the thigh ; the right lung had recent lymph on its lower lobe, and the surface much ecchymosed. Both much congested.

CASE 28.—*Compound fracture ; pyæmia.*

Thomas H—, æt. 24, a railway guard, got his foot crushed between two carriages. An attempt was made to save the limb, but he died between three and four weeks afterwards.

*Post-mortem examination.*—Compound fracture of the foot ; lobular pneumonia in state of gray hepatization and softening. Some recent lymph and purpuric spots on surface. Liver had two or three very large abscesses, one of which had burst, setting up acute peritonitis. Kidneys covered with small purpuric spots, but no inflammatory products discernible.

CASE 29.—*Diseased bone ; pyæmia.*

George E—, æt. 15. Five weeks before admission he began to feel pain in the right knee, which he thought resulted from a blow ; inflammation and suppuration followed. On admission, the head of the tibia was found to be diseased, and at end of three weeks the joint became involved, and afterwards a bed-sore came on the back. Continued better and worse until a week before death, when some constitutional symptoms appeared.

*Post-mortem examination.*—Tibia diseased and joint disorganized. Iliac and femoral veins contained a softening clot. The bed-sore exposed sacrum and trochanter ; lungs in state of lobular inflammation in various stages. Both covered with lymph, but especially those parts where the lobules were affected. Spleen had few small, purulent deposits ; kidneys covered with numerous points of congestion.

CASE 30.—*Amputation ; pyæmia.*

Thomas G—, æt. 32, an intemperate man, had a piece of iron fall on his leg and



crush it. The limb was amputated; he gradually sank, and died at the end of a fortnight.

*Post-mortem examination.*—Body spare, eyes sunken, skin yellowish, stump partly sloughing. Medulla occupied by the usual plug of lymph; the liver and kidneys fatty; the lungs congested and œdematous; the lower parts in early stage of hepatization.

### CASE 31.—*Amputation; pyæmia.*

James W—, æt. 20, had his thigh amputated for osteosarcoma of the head of the tibia. The case progressed for some time satisfactorily, the wound perfectly healing, when the end of the bone became necrosed, and penetrated the flap. Suppuration occurred in the stump, and subsequently abscess in the arm and other parts; finally, general pyæmia, ending in death two months after the operation.

*Post-mortem examination.*—The original wound of stump healed; bone protruding through flap, and bone necrosed. In the left lung was a large abscess, and numerous small, hepatized masses, and the same in the other lung. Both adherent to chest by recent lymph; spleen had large, gangrenous abscess, and there was acute general peritonitis.

### CASE 32.—*Amputation; pyæmia (?)*.

Joseph S—, æt. 15. The leg was amputated for myeloid disease of the femur. A few days afterwards suppuration occurred in the left hand and right foot, as well as abscess in the stump. The wound healed, but subsequently an opening was made behind to admit of the exit of pus. The abscess extended upwards, causing a constant drain, and he slowly sank eleven weeks after the operation.

*Post-mortem examination.*—A large abscess in the abdominal walls; also in stump, exposing bone and extending into hip-joint, as well as through the ischiatic notch into pelvis; also a large independent psoas abscess. No disease in the internal organs.

### CASE 33.—*Amputation; pyæmia (?)*.

Josiah G—, æt. 35; admitted with necrosis of the head of the tibia, arising from injury six months before. Some diseased bone was removed, but subsequently the joint became involved, which necessitated amputation two months after admission. He never rallied, the stump sloughed, and during the last two or three days all the symptoms of pyæmia were present.

*Post-mortem examination.*—Body wasted and sallow. Bone of stump exposed, but not much diseased. The vein was inflamed, the coats being thickened, and in its interior was a clot closely adherent, and its centre softening.

### CASE 34.—*Amputation; pyæmia.*

Joseph M— had a large fibrous tumour of leg, involving deep-seated parts. As the man was in bad health, no operation was performed for a considerable time, and when he was better it was thought advisable to amputate. On the following day he had much hæmorrhage, continued very low, and then symptoms of pyæmia came on, and he died on the eleventh day.



*Post-mortem examination.*—Stump showed no healing process; the right lung gangrenous at the lower part, emitting a fetid odour, and of a green colour; purulent lymph in chest. Liver contained an excess of fat.

### CASE 35.—*Amputation; pyæmia.*

Thomas K—, æt. 45, had the foot affected many years, and of late bones so much diseased that it was amputated. The stump sloughed, and the bone became necrosed. Subsequently a bed-sore appeared, and finally pulmonary symptoms.

*Post-mortem examination.*—Body wasted; stump exposed and bone blackened; bed-sore on sacrum; liver fatty; pleuro-pneumonia, with pleuritic abscess at base of lung. At angle of chest was purulent fluid, and adjacent part of lung softened, showing that resulted probably from abscess in lung. The whole lobe hepatized.

### CASE 36.—*Amputation; exhaustion (?)*.

Jeremiah B—, æt. 60. Compound fracture of the right leg, arm, and ribs. The leg was amputated, but the man never rallied, dying on the thirteenth day.

*Post-mortem examination.*—Stump slightly sloughy; vein at the end of the stump involved in the suppuration, and above this filled with clot; this adherent to coat of vessel, and centre softened into a pus-like fluid; suppuration around the fractured humerus. Slight laceration of the spleen. No recent disease in any of the organs denoting pyæmia.

### CASE 37.—*Amputation; exhaustion (?)*.

Stephen L—, æt. 39, had suffered from chronic ulcer of the leg and great hypertrophy of skin, resembling elephantiasis, for many years. For this the leg was amputated. The saphena vein, which was much thickened, was tied. He never rallied, the stump sloughed, and he died in three days.

*Post-mortem examination.*—Femoral vein showed no recent disease; there was no pneumonia nor any other acute affection. All the organs somewhat fatty.

### CASE 38.—*Compound fracture; pyæmia.*

William S—, æt. 56. Compound fracture of the right leg. Repair was proceeding until the seventeenth day, when the leg swelled; suppuration set in, rigors came on, febrile symptoms and cough, and he died five days after the symptoms commenced.

*Post-mortem examination.*—Suppuration about seat of injury, and neighbouring knee-joint contained purulent fluid; also the left shoulder-joint affected. Lobular pneumonia of both lungs, in all stages to suppurating cavities.

### CASE 39.—*Compound fracture; exhaustion.*

James R—, æt. 40. Compound fracture of leg. After a few days, as no repair was going on, the limb was amputated. He continued, however, to grow worse; rigors came on, and he died sixteen days after the accident.

*Post-mortem examination.*—Stump sloughing; femoral vein, for about two inches, contained a softening clot, like pus, in the centre. All the internal organs healthy.



CASE 40.—*Amputation ; pyæmia.*

Thomas M—, æt. 61. He had lost a finger through the middle of the phalanx. After the stump had healed the bone became necrosed, and whilst in process of separation he was seized with pyæmic symptoms, and quickly died.

*Post-mortem examination.*—Body of a bright-yellow colour; the hand and arm appeared healthy; the joints, which were painful during life, presented no discernible disease; both lungs showed lobular pneumonia, and which in parts were sloughing; surface covered with flakes of lymph, and ecchymosed; liver had numerous abscesses, and the parenchyma throughout was soft; the spleen had numerous firm masses of congested tissue, which had not yet softened.

CASE 41.—*Compound fracture ; pyæmia.*

Thomas G—, æt. 62. He lost three fingers by machinery. The wound was healing until a few days before his death, when symptoms of pyæmia set in.

*Post-mortem examination.*—Whole arm swollen from purulent and serous infiltration, and veins filled with coagulum; numerous abscesses in both lungs, circumscribed and sloughing; thick layer of lymph on both lungs.

CASE 42.—*Amputation ; pyæmia.*

Charles H—, æt. 16. Compound fracture of left leg, from being run over by a cart. An attempt was made to save the limb, but on the seventeenth day gangrene set in, and the leg was amputated below the knee. Gangrene again seized the stump and symptoms of pyæmia came on, and he died in a week.

*Post-mortem examination.*—Veins of leg healthy; lungs healthy; liver contained numerous abscesses; also the spleen several. There was also an abscess in the abdominal walls, which extended down to the pelvis, involving cellular tissue around rectum, and exposing sacro-iliac joint. (Probably this abscess was not secondary, but originated at the time of the accident, and might also have been the source of the infection of the portal vein, causing abscess in liver and spleen.)

CASE 43.—*Diseased bone ; pyæmia ; tetanus (?)*.

Fanny E—, 14; entered hospital with necrosis of the os femoris, resulting from a blow; she was very ill and very anæmic. Two days before her death she complained of pain across the chest, and at the same time some stiffness of the jaws. These symptoms suggested tetanus. There was no other symptom, however, of this disease.

*Post-mortem examination.*—Both lungs subjects of recent lobular pneumonia, in state of red hepatization, and recent lymph on surface of both organs.

CASE 44.—*Injury to foot ; pyæmia ; tetanus.*

H. C—, æt. 20; thrown from a horse, and dislocated the toe of his right foot. It became swollen, and parts around disposed to slough. On the fifth day he was very ill, and his face became stiff, suggestive of tetanus. On following day the symptoms had increased, and on day after he could scarcely open his mouth. There was no rigidity or spasm of any other part of his body. He subsequently fell



into an insensible state, and his neck was observed to be emphysematous. He died on the ninth day after the accident.

*Post-mortem examination.*—Joint of great toe laid open, and parts around sloughing; lungs showed red lobular hepatization on both sides, and on one side pleurisy. The emphysema was found to exist throughout mediastinum, but its cause was not ascertained.

#### CASE 45.—*Amputation; pyæmia (?)*.

Ephraim J—, æt. 61. He received a severe injury to the hand, which never healed, so that a month afterwards amputation was performed at the forearm. Sloughing commenced in the stump, followed by symptoms of pyæmia, with pains in the joints, and he died in ten days.

*Post-mortem examination.*—The lungs showed two or three masses of tissue elevated above the surface, and which felt as if hepatized, but when cut through, showed merely a high state of congestion; surface spotted with ecchymosis; no pleurisy; kidneys commencing degeneration.

#### CASE 46.—*Fractured leg; exhaustion (?)*.

Wm. R—, æt. 34, an intemperate man, fractured his leg. It soon became swollen, discoloured, covered with blebs, and emphysematous; the thigh became involved, and the man died six days after the accident.

*Post-mortem examination.*—The whole leg boggy and crepitant; the fracture was longitudinal, and no arteries were injured; body slightly yellow; all the viscera healthy.

#### CASE 47.—*Compound fracture; exhaustion (?)*.

Edward C—, æt. 53, received a very severe compound fracture of the leg, necessitating the removal of portions of the bone. The case progressed so slowly that the propriety of amputation was often discussed; at last, however, union occurred. He never left his bed, and at the end of this time an abscess formed in the leg, which extended to the knee, and he quickly died.

*Post-mortem examination.*—No recent disease of the body; lungs showed masses of chronic pneumonia in parts; liver so fatty that it swam in water.

#### CASE 48.—*Compound fracture; pyæmia (?)*.

John B—, æt. 39. Compound fracture of leg, necessitating removal of portions of bone. Gangrene set in, and the man died in five days.

*Post-mortem examination.*—Inflammatory gangrene of the leg; lungs spotted on surface, and sections showing masses of congested lobules; end of small intestine covered with granular exudation.

#### CASE 49.—*Fractured leg; pyæmia.*

Simon S—, æt. 54. Fractured tibia, and whilst under treatment during four weeks had more or less delirium tremens, and at last died of pneumonia.

*Post-mortem examination.*—There was much soft exudation about the broken



bone, but no actual pus; the lower lobe of the left lung completely consolidated, and the lower lobe of right in an earlier condition of same. There was a little recent lymph on the left lung; liver very fatty.

#### CASE 50.—*Diseased bone; pyæmia.*

Wm. D—, æt. 48. When admitted he was so exceedingly ill that he could scarcely give any account of himself. He was wasted to an extreme. A large abscess existed on the thigh, and he had disease of the thumb, with necrosis of the bone. He, moreover, made an excess of water, which contained sugar.

*Post-mortem examination.*—A large abscess existed in the left thigh, communicating with the knee-joint; lobular pneumonia in various stages, from gray hepatization to mere congestion; patches of recent lymph on lower lobes; kidneys contained a few small purulent deposits on the surface.

#### CASE 51.—*Amputation; pyæmia; exhaustion (?)*.

William L—, æt. 58. Chronic disease of the elbow-joint, for which the limb was amputated; the patient also had bronchitis. Much blood was lost at time of operation. Shortly afterwards the patient had rigors, and died on the ninth day.

*Post-mortem examination.*—No disease discoverable, except old bronchitis and emphysema.

#### CASE 52.—*Amputation; pyæmia and emphysema.*

Samuel W—, æt. 57. The leg was smashed, requiring immediate amputation. The wound never healed, and he slowly sank until he died, on the thirteenth day.

*Post-mortem examination.*—Lobular pneumonia in state of gray hepatization, and intervening tissue in first stage of serous infiltration. Flakes of lymph on the surface of both lungs.

#### CASE 53.—*Compound fracture; pyæmia.*

William H—, æt. 26. He crushed his foot, which soon began to slough. He was confined to his bed, and soon a bed-sore appeared on sacrum. He died four weeks after the accident.

*Post-mortem examination.*—Lungs contained numerous abscesses, also the liver and spleen. All around the bed-sore was much suppuration, and this surrounded the rectum and extended into the pelvis.

#### CASE 54.—*Fractured leg; pyæmia.*

A man received a severe injury a month before his death, fracturing his leg and skull.

*Post-mortem examination.*—A softening clot found in iliac vein. Abscesses were found in the lungs and in the liver. Pieces of loose bone in skull, and neighbouring scalp sloughy. Inner surface of membrane healthy.



CASE 55.—*Compound fracture ; pyæmia.*

George C—, æt. 30, injured his hand, fracturing the bones of two fingers. Unhealthy suppuration went on, and the patient fell into an unhealthy state, and gradually sank; he had no rigors nor definite attack to denote the time of onset of the affection, but the skin gradually became yellow until it was deeply jaundiced. He died three weeks from the injury.

*Post-mortem examination.*—Numerous abscesses in the lungs, and pleurisy. Liver contained numerous abscesses and red spots of congestion, indicative of the first stage of disease.

SERIES II.—*Pyæmia following injury to the cranium.*

We have separated the cases of injury to the skull for the purpose of comparing the frequency of pyæmia resulting therefrom compared with that arising from injuries to the limbs, and from this it will be seen that death by pyæmia constitutes the exception in fatal injuries to the skull, whilst after amputations half of the cases terminate by this disease. In the former, however, it must be remembered that a delicate and vital organ is in close proximity to the bone, and thus death occurs in a very rapid manner from injury to the brain, or at a later period from inflammation of the organ. In other cases, however, where the bone is affected without implication of the cerebral structure, we think the tendency to pyæmia is less than when a long bone is injured; a large number of well-selected cases would, no doubt, determine the point satisfactorily. We think a very strict observation of the condition of the bone in which pyæmia occurs, also the kind of operation performed upon it, and the part implicated, might result in some very practical information; for instance, if pyæmia were found to occur much less frequently after amputation at a joint than when the shaft was cut through, the former operation, *cæteris paribus*, could not but be preferred. We had separated the cases where the cranium was injured from those where other portions of the osseous system was affected, for another purpose, which has already been referred to under the subject of *liver*, that is, to show whether the pyæmic process at all differs when the cranium is the part affected, and whether the liver is more liable to be attacked. Our few cases, as before said, do not warrant the opinion.



CASE 56.—*Injury to cranium ; pyæmia.*

John D—, æt. 40. A policeman, and intemperate. Five weeks before his death he received a blow on the head, causing a scalp wound. He came to the hospital ; and left in twelve days with the wound healed. He was unable, however, to do his duty, and soon began to feel very ill with pains in his joints, &c., and returned to the hospital for his so-called rheumatism. He was then exceedingly ill, had severe febrile symptoms, his right arm swollen and painful ; skin jaundiced. He rapidly got worse, pneumonia set in, and suppuration extended along the arm.

*Post-mortem examination.*—Body uniformly jaundiced. Large abscess in arm, also in leg and in abdominal walls. The skull showed the bone beneath the wound slightly fissured, surface rough, and commencing caries. Both lungs contained abscesses, and on both sides pleurisy. Liver contained a large abscess and surrounding tissue gangrenous.

CASE 57.—*Injury to cranium ; pyæmia.*

Timothy C—, æt. 35. Fractured skull from pistol-shot. He died in six days, with febrile symptoms and convulsions.

*Post-mortem examination.*—Dura mater torn, brain beneath softening. The organs remarkably decomposed, being all full of gas. Masses of red and gray hepatization in both lungs. Liver contained two small abscesses at its edge.

CASE 58.—*Injury to cranium ; pyæmia.*

William G—, æt. 49. A brick fell from a house, fracturing his skull. He lived sixteen days, during this time having paralysis and other cerebral symptoms.

*Post-mortem examination.*—Hernia cerebri and softening of brain to its centre. Abscess over sternum, in anterior mediastinum, and in sterno-clavicular joint. Various stages of red and grey hepatization of both lungs in masses.

CASE 59.—*Injury to cranium ; pyæmia (?)*.

John L—, æt. 46. Fell from a height, causing most extensive scalp wound, fracture of skull and sternum. He died in eight days.

*Post-mortem examination.*—Much suppuration beneath the scalp ; the brain slightly bruised. Suppuration in portions of fractured sternum. Lungs in early stage of pneumonia, with pleurisy.

CASE 60.—*Injury to cranium ; pyæmia.*

William H—, æt. 33. Fell from a height, causing scalp wound and injury to abdomen, followed by peritonitis. Cerebral symptoms coming on, he was trephined, but without any result, as he gradually sank.



*Post-mortem examination.*—Purulent matter beneath the scalp; bone carious and dura mater involved, as well as under surface in contact with the brain. The longitudinal sinus contained a softening clot. Lungs full of abscesses, and many of them covered with lymph. The abdomen showed a local peritonitis and effusion of blood, arising from laceration of the liver, which was undergoing repair.

In Cases 6 and 54 the cranium was also fractured.

CASE 60.\*—*Fractured cranium; pneumonia.*

Eugene W—, æt. 8. Received fracture of skull, and died at the end of two weeks. There was found to be no injury to or inflammation of the brain, but the lower lobes of both lungs were consolidated.

SERIES III.—*Cases of external abscess followed by pyæmia.*

The most frequent cause of pyæmia, next to that of injury or disease of the bone, is an acute, diffused suppuration in a limb, which has not penetrated the integument. Indeed, the very worst cases described in this report are instances of this kind, and which are interesting in many points of view, mainly so in showing that no external wound or sore is necessary for the production of pyæmia, a fact which some writers have scarcely admitted. With such views, therefore, cases here described would probably not have been recognised, and thus another unjust inference would be drawn from such instances where the purulent infection occurred before the patient entered the hospital—that pyæmia is not a disease met with in private residences, but one peculiar to hospitals. The very worst cases in our list, we repeat, were the following, which occurred before the patients were admitted into the institution, but which, if they had not been so admitted, and not submitted to examination after death, would never, in all probability, have excited a suspicion as to the true nature of the disease. We are quite aware of the facts which prove beyond a doubt that when patients are crowded together, as they were in the Crimean hospitals, that a contagious influence



of a pyæmic character will spread, but we are not so sure that in an ordinary, well-ventilated hospital there is a greater susceptibility to the affection than in private houses, especially those of the poor, whence our patients come.

It is possible that in some of these cases of deep-seated abscess the surface of the bone may have been affected, and therefore they would come strictly under the first series. Indeed, abscess of a limb, connected with acute necrosis of bone, is highly favorable to the production of pyæmia. It will be observed also how remarkably alike were some of the following cases, the subjects being boys, with suppuration of the leg and acute general pyæmia; we have therefore separated these into a distinct series for the sake of greater clearness.

#### CASE 61.—*Abscess of thigh; pyæmia.*

Henry B—, æt. 16. He was a blacksmith, and five weeks before admission, he struck his right knee against the anvil, but felt no ill effects for a week, when the leg began to pain him, and he fell ill, but only nine days before admission did it much inconvenience him. The part then began to swell, and he grew rapidly worse. When he came in, he was exceedingly ill, he was in a high state of fever, and an abscess existed near the knee. This was opened; the other joints were painful; he was delirious, and died in three days.

*Post-mortem examination.*—There were two or three pustules on the left hand. There was an abscess in the knee-joint, and the bones bare; the painful joints presented no morbid appearances. Each lung contained about fifty small masses of hepatized tissue, and some of these were softening; the surface spotted, and over the inflammatory masses were flakes of lymph. Acute pericarditis, with layers of lymph. The muscular walls had small deposits of pus on their exterior, and the mitral columns within; the liver had numerous small, purulent deposits, and all the small arteries leading to them contained pus. Spleen and kidneys also contained pus. The brain healthy.

#### CASE 62.—*Abscess of thigh; pyæmia.*

Joseph W—, æt. 9. He fell and hurt his right leg, but did not strike it. On the following day he complained of pain, and the leg was swollen. He became rapidly ill, and on the ninth day he was admitted in a dying state. The thigh swollen and fluctuated. Great fever, tongue brown and covered with sordes, pulse scarcely to be felt for rapidity. Râles throughout chest. In a few hours a pericardial rub became audible, and subsequently he had some slight convulsive movements. Few vesicles, filled with an opaque fluid, existed on various parts of the body.

*Post-mortem examination.*—Muscles of thigh infiltrated with pus as deep as the



bone. The brain had small patches of lymph on gray matter of hemispheres, resembling tubercles. Lungs had posterior parts hepatized, and containing lobules further advanced in inflammation; also many in a simple congested condition. The thyroid body and adjacent muscles contained pus. Heart had its muscular walls occupied by numerous small, purulent deposits, some of which had burst and produced acute pericarditis. Liver had numerous small abscesses. Spleen also white masses softening into purulent matter. Kidneys had numerous points of suppuration on surface, and, interspersed, a number of red spots.

#### CASE 63.—*Abscess of thigh; pyæmia (?)*.

James H—, æt. 15. He fell and struck his right thigh. The injury appeared slight, but becoming swollen, he entered the hospital four days afterwards. In the course of two days he had rigors and other symptoms of purulent absorption, pain in the side, and a pleuritic rub was heard. The joints became painful, and the boy appeared as if he would shortly die. He, however, rallied, and the febrile symptoms disappeared. Subsequently, however, a bed sore appeared, and he gradually sank nineteen days after admission.

*Post-mortem examination.*—The soft parts of the thigh were infiltrated with pus, and the bone quite bare, and the knee-joint contained purulent fluid, also both elbow-joints. The left chest contained several pints of offensive, brown fluid. The lung was compressed and carnified; the tissue only very doubtfully affected. No suppuration in any part but the joints.

#### CASE 64.—*Abscess of thigh; pyæmia.*

Thomas M—, æt. 16. Admitted with a swelling around the thigh, which was supposed to arise from injury, and from which the lad died in seventeen days.

*Post-mortem examination.*—Abscess in thigh, surrounding the bone and involving the knee-joint. On chest also large abscess, which communicated with sterno-clavicular joint and abscess in the mediastinum; lobular pneumonia of both lungs, some portions suppurating, and thick layers of lymph covering both; bronchial tubes full of purulent mucus. Kidneys, several abscesses in cortex.

#### CASE 65.—*Abscess of thigh; pyæmia.*

Elizabeth H—, æt. 6. She was almost in a dying state when admitted; the pulse very feeble; breathing rapid and difficult; left thigh swollen, said to have arisen from an injury a few days before; the case thus appeared to be one of pyæmic pleuro-pneumonia.

*Post-mortem examination.*—The thigh was found infiltrated with serum and inflammatory exudation, but no actual pus. Lobular pneumonia of both lungs; some were softening, but no abscess had as yet formed; pleurisy on both sides. Heart had its walls occupied by small, purulent deposits, and the pericardium was much ecchymosed. The kidney covered with minute, purulent deposits.



CASE 66.—*Abscess of thigh ; pyæmia.*

Fred. H—, æt. 8. The boy had had a kick on the right leg, and subsequently he became very ill. On admission, three days before death, he was evidently suffering from pyæmia. A lancet was put into the leg, and matter evacuated.

*Post-mortem examination.*—An abscess amongst the muscles of the right leg, and a secondary abscess over the sternum. Both lungs contained numerous abscesses and lobular pneumonia in various lesser stages; the surface covered with lymph; on posterior surface of heart a small deposit of pus in its substance, and a small branch of the coronary artery was filled with pus of a white colour, and which contrasted strongly with the red colour of the neighbouring branches, filled with blood; also numerous spots of ecchymosis on surface; one of the mitral columns contained a small, purulent deposit, and which flowed out when the spot was pricked. Kidneys contained numerous purulent deposits and spots of ecchymosis, and the former surrounded by a halo of injected tissue. Liver and spleen healthy.<sup>1</sup>

SERIES IV.—*Other cases of abscess, of less severity, followed by pyæmia.*CASE 67.—*Abscess in chest ; pyæmia.*

Richard F—, æt. 46. He was admitted, very ill, with an abscess on the chest; he had only noticed this for three days, but he had rigors two weeks before. In a few days cerebral symptoms came on, which continued until death, ten days after admission.

*Post-mortem examination.*—The brain had several abscesses; the lungs were healthy; the liver contained two soft masses, which appeared to be the early stage of suppurative inflammation; spleen also had some similar masses.

CASE 68.—*Injury to sacrum ; pyæmia.*

Richard B—, æt. 14. He fell on his sacrum, producing an injury to the bone, followed by abscess, and which caused death a fortnight afterwards by involving the cord.

*Post-mortem examination.*—Inflammation of bladder; suppuration of kidneys, lungs, lobular inflammation and pleurisy.

---

<sup>2</sup> A case in all respects corresponding to these occurred lately in the person of one of our students. Not being in very robust health, he commenced to undergo his university examination. Whilst this was in progress he took a long walk, and on his return complained of pain in his thigh. When we saw him, a day or two afterwards, he might be styled a dying man; he was desperately ill, with all the worst symptoms of pyæmia. Before the week had elapsed he was dead, the abscess in leg never having penetrated the skin; some others had made their appearance on the surface of the body, and he had, without doubt, lobular pneumonia. What was the cause of the primary mischief was not at all clear.

Whilst these pages are at press there is a boy in the hospital, who, after falling into the water, had diffused inflammation of the leg; he now has constant rigors, and is dying of pneumonia.



CASE 69.—*Abscess of leg ; pyæmia.*

William S—, æt. 28. Admitted with diseased knee-joint and suppuration around it, extending up the thigh. A large quantity of matter was evacuated. Subsequently the man became very ill; rigors came on, with cough, &c., and he died a fortnight after admission.

*Post-mortem examination.*—The knee was found disorganized and surrounded by pus; an abscess over ensiform cartilage. Throughout both lungs numerous masses of lobular pneumonia, in state of gray hepatization and softening; lymph on surface; kidneys and spleen waxy.

CASE 70.—*Abscess in groin ; pyæmia.*

James S—, æt. 42. He was admitted with a large abscess in the groin, which was not believed to be syphilitic. A few days before his death he had rigors, and fell into a typhoid state, and the skin became yellow.

*Post-mortem examination.*—Body of bright-yellow colour; lobular pneumonia in various stages, besides distinct abscesses; over the inflamed lobules were numerous patches of lymph; liver had numerous abscesses, a third of the organ being affected, three or four the size of a hen's egg.

CASE 71.—*Abscess of arm ; pyæmia.*

William M—, æt. 68. Admitted with extensive cellular suppuration of the whole of right arm, resulting from injury to the hand, and he gradually sank.

*Post-mortem examination.*—Lungs gorged with blood; the lower lobe of right in state of red hepatization, and this covered with a layer of lymph; kidneys contained purulent deposits.

CASE 72.—*Sore on lip ; pyæmia.*

Mary W—, æt. 20. A barmaid; stated that she had been ill for four days, with a swelled lip, arising from a pimple upon it, and that for two days had severe pain in her side. She was exceedingly ill. The lip, chin, and front part of neck, much swollen; pleuro-pneumonia. Died three days after admission. No history of the wound in the lip being poisoned.

*Post-mortem examination.*—Parts about lip and neck saturated with purulent fluid; lobular, suppurative pneumonia on both sides with pleurisy.

CASE 73.—*Abscess of leg ; pyæmia.*

Joseph O—, æt. 18. Seven weeks before admission he observed the calf of his leg to be very painful, followed by a swelling. Iodine was applied, and the swelling became less; subsequently it suppurated, and febrile symptoms came on, with pains in the limbs, &c. He continued thus for some weeks with swollen and painful joints, but there was no evidence of suppuration in them, when suddenly all the



acute febrile symptoms returned with rigors, &c.; the left eye became inflamed, and parts around swollen, as if eyeball involved.

*Post-mortem examination.*—Sore on calf of right leg; left knee-joint contained purulent fluid; the right shoulder, which was very painful during life, appeared not unhealthy; pus was found surrounding the globes of both eyes, but especially the left; this had not involved the cavernous nor other sinuses; and the membranes and brain were healthy. All the internal organs were healthy, except, perhaps, the lungs, which showed numerous congested lobules, which probably indicated the first stage of pneumonia.

#### CASE 74.—*Abscess in neck; pyæmia (?)*.

Thomas W—, æt. 67. Had long-standing necrosis of the lower jaw, with much suppuration about it. He died after a few days' illness.

*Post-mortem examination.*—Pleuro-pneumonia of right lung; lower lobes hepaticized, and surface covered with lymph; kidneys slightly degenerated.

#### CASE 75.—*Abscess in neck; pyæmia (?) ; exhaustion (?)*.

Eliza M—, æt. 31. She was a nurse in the hospital, and whilst at her duties complained of sore throat, and took to her bed, with severe febrile symptoms and great depression. She was frequently examined for diphtheria, but there was no such disease found. The symptoms continued for several days, she became excessively ill, and was in the condition usually styled typhoid. She subsequently complained of severe pain in all the joints, and an abscess appeared in the neck. Subsequently a bed-sore came, and she gradually sank, dying exactly four weeks after the first onset of the symptoms.

*Post-mortem examination.*—A very large abscess in the neck, and a sore over sacrum; all the organs carefully examined, but no disease found.

#### CASE 76.—*Removal of tumour; pyæmia.*

Ann O—, æt. 50. She had a small tumour removed from the breast. She went on well for a fortnight, when symptoms of pyæmia came on, with rigors, abscess in thigh and leg. She continued in a very low state for nearly two weeks, when she died.

*Post-mortem examination.*—The wound in breast not healed, but healthy looking; abscesses in other parts, as before mentioned. All the organs soft, but healthy.

#### CASE 77.—*Abscess of leg; pyæmia.*

James K—, æt. 47. Came in dying with phlegmonous erysipelas of left leg, and said, though doubtfully, to arise from injury.

*Post-mortem examination.*—Leg infiltrated with pus; no appearance of injury. Lungs showed extensive lobular congestion, as in the first stage of pyæmic pneumonia, some lobules being almost of a black colour from effusion of blood into the tissue; thin fibres of lymph on the pleura, corresponding to the affected portions.



CASE 78.—*Abscess ; pyæmia.*

Edward W—, æt. 52. Admitted in a very feeble condition, with a large abscess over the shoulder-blade ; this extended to a considerable distance, and he gradually sank.

*Post-mortem examination.*—Skin of back quite undermined, and adjacent muscles soft and sloughy ; bone of scapula laid bare ; joint full of dirty, purulent matter, and an abscess over the pubis ; pleuro-pneumonia of a large portion of left lung ; lower lobe consolidated, and a portion of upper surface covered with delicate layer of lymph.

CASE 79.—*Sloughing wound ; pyæmia.*

Mary B—, æt. 51. During the operation of hernia she had much hæmorrhage, and blood became effused under the abdominal walls. The wound sloughed, and the patient died in three days.

*Post-mortem examination.*—Wound sloughy, and discharging sanious fluid and gas from decomposition. Pleuro-pneumonia on right side ; early stage of hepatization, and surface covered with lymph.

CASE 80.—*Psoas abscess ; pyæmia.*

Francis S—, æt. 44. Had an abscess in loins and neighbourhood, connected with disease of the cæcum. After long-continued suppuration he died at last of pneumonia.

*Post-mortem examination.*—Abscess in loin involving the joint ; both lungs in state of red hepatization, but the section showed throughout a number of lobules of gray hepatization. Both covered with lymph.

CASE 81.—*Abscess on foot ; pyæmia.*

James W—, æt. 45. Four or five days before admission he pinched his foot with a tight boot ; it was much inflamed and swollen, and the man became very ill, with pains in the chest, &c. On admission, dying of pneumonia.

*Post-mortem examination.*—Foot swollen and dark ; no abrasion of surface ; exudation beneath the integument ; the veins of leg and thigh contained loose coagula ; lobular pneumonia on both sides ; portions of tissue commencing to slough ; pleura covered with recent lymph. The other organs soft, but healthy.

SERIES V.—*Cases of pyæmia following superficial wounds, internal abscesses, &c. ; also cases styled idiopathic.*

It might be conjectured that in some of the cases given in the last series, in which there was no evidence to show that an injury had been received, the disease was idiopathic or primarily one of the blood, and that the local suppuration supposed



to be the source of the infection was a secondary effect. We think, however, on the other hand, that being absolutely certain that in the majority of cases of pyæmia a known and sufficient cause is to be found in some wound or injury, it is scarcely an assumption to regard a local disease of a similar character as the source of infection, under whatever circumstances we may find it. Still, however, cases do occur of so mysterious a character that we are forced to discuss the question of idiopathic pyæmia; but even here the sources of contagion may be overlooked, for slight they certainly may be, if a gonorrhœa or leucorrhœa can constitute the *primum mobile* of the disease. In the cases which we here give it will be seen that where superficial wounds existed, a sufficient cause for infection of the blood was present, but in others, where the wounds or injuries were slight, very important doubts may arise. Thus, if a patient die of an internal inflammation, it may have to be determined whether that arise from an infection of the blood or not, and if there should appear only one mode by which this can have occurred, a very serious and important conclusion would be arrived at. In the next case given (82) the question of manslaughter depended, in fact, upon the scientific points connected with pyæmia, although the subject was not discussed in a court of law. In other cases, as 85, a seton appeared to be the cause, whilst in 87 the cause was the bite of a horse, without any external wound. In Cases 90 and 91 no source of contamination of blood could be found, but in these it is quite possible that some inflammatory process might have existed and been overlooked. The Cases 84, 88, and 89, constitute the exceptions to the rule that abscesses within the body are not focuses of infection. In these, spinal and hepatic abscesses appeared to be the primary cause for the blood disease.

It will be observed that in some of these cases there was no actual suppuration, and the inflammatory products had not reached the stage of pus.

#### CASE 82.—*Superficial scars; pyæmia (?)*.

Samuel S—, æt. 13. He was a sailor just returned from the West Indies. The whole surface of the body was in a frightful condition from wounds, and on the head was a large swelling, which gave exit to blood. He stated that the said marks were



the results of floggings by the captain. He soon fell into a drowsy state, which at last ended in coma, and he died four days after admission.

*Post-mortem examination.*—The head swollen and scalp œdematous; numerous weals on the body and legs, also scabs on arms and legs, and on the latter a small abscess. Lungs covered with purpuric spots, and section showed the lobules dark coloured, congested, and devoid of air. Tubes full of purulent mucus. The cæcal portion of intestine covered with mucus and adherent lymph.

### CASE 83.—*Scar on lip; pyæmia.*

H. H—, æt. 60. He had an epithelioma of the lip removed, and the part healed. When he had almost recovered, symptoms of pyæmia came on, and in a few days he died.

*Post-mortem examination.*—Body of a marked yellow hue; red hepatization of the right lung, and covered by recent lymph; one of the centre valves perforated, as if by acute ulceration, and from it was hanging a recent vegetation and a coagulum undergoing discoloration; on the interior of the heart were a few white points of purulent matter. The spleen contained large masses of congested tissue; many of these were breaking down and purulent; kidneys covered with points of pus, surrounded by a red halo.

### CASE 84.—*Spinal abscess; pyæmia.*

Henry M—, æt. 19, was sent to hospital as one of typhoid fever, and said to have been ill two weeks. He died in a few hours.

*Post-mortem examination.*—The only external appearance of a wound was a scab from an abrasion on the heel; caries of the spine in upper dorsal and lower cervical vertebræ, with an abscess in front, also some pus within the canal itself; numerous abscesses in the lungs; heart had small purulent deposit on its anterior wall; kidneys, numerous small deposits.

### CASE 85.—*Seton; pyæmia.*

William W—, æt. 49. Admitted into a medical ward for supposed rheumatism. It was then found that one hip-joint was the subject of old disease, and the other of more recent. For the latter various remedies were tried, and at last a seton was ordered. This, after a short time, caused a discharge, but without any unusual amount of inflammation and suppuration. Four days after its insertion he was seized with rigors, febrile symptoms, pain and tenderness of the joints. These symptoms continued, indicative of well-marked pyæmia, for five days, when he died.

*Post-mortem examination.*—The seton wound showed the parts around slightly inflamed, but there was no suppuration and no marked unhealthy action. The joints were carefully examined, but nothing like pus apparent. The hip for which the seton had been used showed acute ulceration of the cartilage. All the organs of the body were healthy.

### CASE 86.—*Ulcer on leg; pyæmia.*

Wm. B—, æt. 45. Admitted in a dying state, with a chronic ulcer on the leg in a sloughy state.



*Post-mortem examination.*—Body cachectic looking, slightly yellow; numerous abscesses throughout both lungs, and surface ecchymosed; kidneys slightly granular.

### CASE 87.—*Injury to hand; pyæmia (?)*.

Thomas H—, æt. 47. Three weeks before death he was bitten by a horse in the left hand, and it appeared that the skin was only bruised, and not broken. He appeared not to have suffered in consequence until three days before death, when he became very ill, with rigors, &c., followed by symptoms of pyæmia, with pains in the joints, &c., and the arm of affected hand became swollen.

*Post-mortem examination.*—The surface of body marbled by the blood-stained veins; the lungs showed no actual inflammation, but the section was spotted from the lobules being in an extreme state of congestion.

### CASE 88.—*Hepatic abscess; pyæmia.*

Thomas D—, æt. 25, a sailor, and two years before admission he had contracted dysentery at Burmah. On admission he had all the symptoms of hepatic abscess. A week afterwards he had a fit of an epileptic character, and then continued in a semi-conscious state for some days, when he partially recovered. He subsequently fell into an insensible condition, with weakness of the right side of the body, which at length became quite paralysed, and he died a month after the occurrence of the fit.

*Post-mortem examination.*—Skull and membranes healthy; an abscess the size of an egg in left hemisphere of brain, and around it softened tissue. The base of the right lung contained an abscess and affected by pleurisy. Colon showed old dysentery, the surface being puckered and thickened from former disease. Two abscesses in the liver, apparently of some considerable age, judging from the thickness of the walls surrounding them.

### CASE 89.—*Hepatic abscess; pyæmia.*

William K—, æt. 37. Had long suffered from stricture of the rectum, and had had instruments passed. A week before his admission he was taken very ill with febrile symptoms, which had grown much worse until that time. He was exceedingly ill, high fever, skin yellowish, he was delirious, and thus it was thought that he was suffering from acute jaundice. In two days he died.

*Post-mortem examination.*—The rectum was much diseased; there was recent ulceration as well as old cicatrization; the walls thickened, and cellular tissue around soft; liver full of abscesses, and portal vein filled with coagulum of a brown colour; so also splenic and mesenteric veins. Lungs excessively congested; numerous parts filled with blood, as if actual extravasation had occurred within them, and surface spotted with purpura or ecchymoses.

---

*Note.*—We lately had the opportunity of witnessing a case where there was, no doubt, a purulent infection of the blood, but in which the source of it might have been easily overlooked, being altogether internal. A young lady died of acute double



CASE 90.—*Idiopathic pyæmia* (?).

Joseph F—, æt. 41, was a carman, and a week before admission began to feel ill, with pains in his limbs, fever, &c., and subsequently difficulty of breathing. On admission he complained of pain in various parts of the body, but there was no swelling of the joints. His voice was hoarse, and he had a cough. The laryngeal symptoms soon became so severe, that the house-surgeon performed tracheotomy. The man, however, died two days after admission.

*Post-mortem examination.*—Body that of a healthy man. No injury or sore to be found on any part of the body, but numerous small abscesses, containing dirty-coloured pus, in various parts of the body; acute laryngitis and bronchitis; lungs in early stage of inflammation, with numerous lobules hepatized.

CASE 91.—*Idiopathic pyæmia* (?).

Alfred S—, æt. 25. This man was first admitted into the surgical ward, as he said he had received some injury. He was very ill, with symptoms of typhoid fever, and was removed to a medical ward. He was then exceedingly ill, suffering from pneumonia, and his history suggested pyæmia. He died four days after admission.

*Post-mortem examination.*—The body presented no external marks of violence, except a bruise on the left elbow; the joints were healthy, including those of which he had complained. Lungs excessively congested throughout, but more especially in particular lobules, so that a section gave a mottled appearance; others in a state of gray hepatization; some had softened, and over these there was lymph; the posterior parts were uniformly hepatized in its earliest degree.

SERIES VI.—*Pyæmia following disease of the urinary organs connected with stricture, lithotomy, extravasation of urine, &c.*

Cases of these diseases frequently terminate by a purulent infection of the system. Lithotomy, if speedily fatal after the operation, is generally owing to pericystitis, with or without peritonitis. In Cases 103, 104, 105, however, the system was generally infected. If the operation be not immediately fatal, but death occur soon afterwards in a slower manner, it is generally through disease of the kidneys, as in stricture, &c. If a patient die with stone in the bladder, his end also comes about in a very similar way.

Stricture may cause death in various ways. If by extravasation of urine, or pleuritis of a few days' standing, without any evident cause. It was found associated with a lobular pneumonia; and at the same time there was discovered a great distension of the Fallopian tubes, which were filled with purulent matter.



tion of urine, a fatal result may take place without any indication of a visceral complication, although it is very probable that the blood may be infected. In some cases this is evidently the case, as seen by the ordinary pyæmic results in the lungs.

When death occurs slowly from stricture, it is generally by implication of the kidneys, by acute suppuration, even if they be chronically diseased as well. This implication of a vital organ is sufficient cause for the fatal result; but in many cases a general infection of the blood occurs, as in Cases 97, 98. Sometimes even this may happen without any affection of the kidney; and the fact, therefore, is important to notice that in cases of stricture with abscess in perineum, &c., where death might be thought due to urinary or renal disease, an ordinary pyæmia has in reality existed. Such cases are seen at 92, 95, 99, 101, 102.

It will be seen that injuries to the pelvis implicating the urinary organs lead to the same results as above mentioned diseases, as Cases 108, 110; also from any other cause, as Case 109.

#### CASE 92.—*Stricture; pyæmia.*

Daniel W—, æt. 49. He had had stricture for twenty-six years, and of late had been very ill with perineal abscess, for which he entered the hospital. The abscess was opened, and a catheter passed into bladder. About three weeks afterwards, and twelve days before his death, he felt very unwell; and in the course of six days had rigors, fever, and other well-marked symptoms of pyæmia.

*Post-mortem examination.*—A large abscess existed in the chest; there was suppuration around the bladder; kidneys healthy; lobular pneumonia and purulent matter in chest; spleen very soft, in parts indicative of an early inflammatory process (?).

#### CASE 93.—*Extravasation of urine; pyæmia.*

John T—, æt. 48. Entered the hospital with extravasation of urine and cellulitis around bladder, connected with stricture, and he died on the following day. Lobular pneumonia in various stages, and surface covered with purpura.

#### CASE 94.—*Extravasation of urine; pyæmia.*

Alfred S—, æt. 2½. Admitted with extravasation of urine, owing to a calculus having ulcerated through urethra. There was great swelling of scrotum, penis, and adjacent parts, and the boy died in three days.

*Post-mortem examination.*—Lung showed lobular pneumonia in all stages between red and gray.



CASE 95.—*Stricture ; pyæmia.*

William P—, æt. 43. Had had a stricture for several years, and for which at last the bladder was punctured per rectum. He was relieved, and a catheter could subsequently be passed. Afterwards a perineal abscess came, followed by rigors, fever, &c., and he sank.

*Post-mortem examination.*—Body wasted, eyes sunken, skin yellow, abscess in perineum and around the neck of the bladder; kidneys healthy; lungs showed all stages of lobular pneumonia, many masses softening, and almost burst through the pleural membrane, and this covered with lymph.

CASE 96.—*Extravasation of urine ; pyæmia.*

John H—, æt. 40. Admitted with extravasation of urine. Incisions were made, and he went on well until symptoms of pyæmia came on.

*Post-mortem examination.*—Skin yellowish; kidneys healthy; right lung subject of red hepatization throughout, but in the midst of it were numerous lobules in state of gray hepatization and softening, those on surface covered with layers of lymph; left lung in early stage of pneumonia.

CASE 97.—*Extravasation ; pyæmia.*

Joseph H—. Entered with extravasation of urine from old stricture. Incisions were made, but he died on the thirteenth day.

*Post-mortem examination.*—Body brightly jaundiced; bladder inflamed; kidney suppurating on the surface; lobular pneumonia in various stages; pleura healthy; liver healthy.

CASE 98.—*Stricture ; pyæmia.*

James M—, æt. 57. Admitted in a dying state, with stricture.

*Post-mortem examination.*—Stricture, with abscess in prostate; suppuration of both kidneys; lungs, lobular pneumonia in various parts; no pleurisy.

CASE 99.—*Stricture ; pyæmia.*

George S—, æt. 54. Had stricture for many years; the urethra was opened in the perinæum; a few days afterwards symptoms of pyæmia came on.

*Post-mortem examination.*—There was no very unhealthy action about the wound; bladder not much affected; kidneys healthy; lungs showed lobular pneumonia with small abscesses; other organs healthy.

CASE 100.—*Stricture ; pyæmia (?)*.

James G—, æt. 39. Suffered from stricture for many years, and admitted for perineal abscess. While under treatment seized with febrile symptoms, and shortly died.

*Post-mortem examination.*—Inflammation of bladder and urethra; kidneys healthy; lungs, both lower lobes in state of red hepatization, and both covered with recent lymph.



CASE 101.—*Extravasation of urine ; pyæmia.*

Man, æt. 40—50. Had stricture many years, and entered the hospital with extravasation, dying two days afterwards.

*Post-mortem examination.*—Lobular pneumonia in various stages; kidneys healthy.

CASE 102.—*Extravasation of urine ; pyæmia.*

Man, æt. 40—50. Had stricture many years and much catheterism; came in with inflammation of bladder; subsequently he had rigors, fever, pains in the joints, and all symptoms of pyæmia.

*Post-mortem examination.*—The most noticeable appearance was the existence of purpura on the body and on the viscera. The lungs were thus spotted, and highly congested, numerous lobules being almost solid, and in one or two a little recent inflammatory exudation; heart spotted; liver and spleen soft; kidney also spotted; brain in a remarkable purpuric condition, the section, as well as ventricles, being ecchymosed.

CASE 103.—*Lithotomy ; pyæmia.*

Wm. B—, æt. 23. He died ten days after the operation of lithotomy. Lungs showed lobular pneumonia, suppurating, and pulmonary arteries leading thereto filled with softening fibrin; kidneys had several suppurating points; suppuration around the bladder, and involving the veins; iliacs filled with softening fibrin.

CASE 104.—*Lithotomy ; pyæmia.*

John B—, æt. 54. He had suffered from stone for two years. He did not take chloroform when cut, and died six days afterwards.

*Post-mortem examination.*—Numerous vesicles, full of opaque fluid, on the abdomen; but it must be remarked that hot flannels had been applied to this part. Some cellulitis around the bladder; ureters and pelvis of kidney dilated, inflamed, and covered with flakes of lymph; kidneys full of points of suppuration; lower lobes of both lungs solidified by recent pneumonia, amongst which were numerous lobules of gray hepatization, some of these soft, as if would soon become purulent.

CASE 105.—*Lithotomy ; pyæmia (?)*.

Thos. W—, æt. 58. He had had a calculus for several years, and had suffered long from bronchitis. He was operated on, but gradually sank fourteen days afterwards.

*Post-mortem examination.*—An abscess existed in the abdominal walls, just below the left costal cartilage. Lower lobes of both lungs solidified by gray hepatization, which also softening; in upper lobes the inflammation, as a whole, not so far advanced, but section showed numerous lobules solid and gray, as if the intervening tissue had become subsequently affected. Pericystitis and suppuration of kidneys.



CASE 106.—*Calculus vesicæ ; pyæmia.*

Jesse B—, æt. 16. He had had a calculus for eight years. Immediately after his entry into the hospital he was taken very ill, with febrile symptoms, and became covered with purpura. Subsequently his neck and tongue swelled, and at the end of a fortnight he died.

*Post-mortem examination.*—Body still had purpuric spots on it, and also the heart ; lungs had masses of softening, gray, hepatized tissue ; kidneys suppurating ; tongue contained abscesses.

CASE 107.—*Calculus ; pyæmia.*

Henry J—, æt. 50. Admitted with stone of several years' duration, and was in a very bad state of health, with purulent urine, &c. Three days afterwards he was attacked with shivering, and he appeared as if he would shortly die. He rallied, however, reaction came on, with febrile symptoms, red, dry tongue, &c., and he died a fortnight after admission.

*Post-mortem examination.*—Bladders much inflamed ; kidneys nearly destroyed by suppuration. Lungs showed most extensive lobular pneumonia ; each lung contained about fifty abscesses, and these about the size of a marble ; the surface of both organs covered with lymph.

CASE 108.—*Fractured pelvis ; cellulitis ; pyæmia.*

Evan T—, æt. 55. A heavy cask fell on him, fracturing his pelvis, and lacerating the bladder, from which he died in five days.

*Post-mortem examination.*—Much extravasation of blood and urine around bladder beneath peritoneum ; lungs showed lobular pneumonia in various stages.

CASE 109.—*Pelvic cellulitis ; pyæmia.*

Wm. McM—, æt. 60. Owing to disease of the rectum, an inflammation was set up in the perinæum, which terminated in suppuration, extending up the abdominal walls, after the manner of that produced by extravasation of urine. He died at the end of a week. There was recent pneumonia of the lower lobes of both lungs ; the other organs healthy.

CASE 110.—*Fractured pelvis ; cellulitis ; pyæmia.*

Wm. C—, æt. 18. Fractured pelvis and lacerated urethra, setting up cellulitis about bladder, and from which he died at the expiration of a month.

*Post-mortem examination.*—Recent lobular pneumonia in state of red and gray hepatization.



SERIES VII.—*Pyæmia resulting from carbuncle.*

In dividing our cases in the manner we have done according to the cause or to the seat of the disease which has produced the blood-infection, we find three cases of carbuncle, which were fatal through pyæmia. Examples so few in number can give no satisfaction as to the frequency of this result; but since in these cases death would no doubt have been attributed to exhaustion had no inspection been made, we think it very probable that pyæmia may lead to a fatal issue more frequently than is supposed. We only regret that some other fatal cases of carbuncle were not submitted to post-mortem examination. It has been observed that diabetes is sometimes associated with carbuncle and sloughing sores; our post-mortem records throw little light on this subject, which must be rather studied in the wards. The only known cases of diabetes connected with external suppuration which has come under our notice in the dead-house is Case 50, before described.

CASE 111.—*Carbuncle; pyæmia.*

Samuel J—, æt. 70. Died of a large carbuncle on the back, which had existed for a month.

*Post-mortem examination.*—Left lung contained several masses of lobular pneumonia, and some of these suppurating, and over them flakes of recent lymph; mucous membrane of tubes inflamed. Heart had small points of pus in its walls and carniæ columnæ, and coronary artery contained some breaking-down fibrin. Liver had small congested spots on its surface; the hepatic artery contained some softening fibrin. The kidney also had small suppurating points. The veins around the carbuncle were filled with coagulum.

CASE 112.—*Carbuncle; pyæmia.*

Mary M—, æt. 48. Had suffered with a carbuncle on the shoulder for nearly four weeks before her death. During the last two days she had delirium, but she appeared to die of exhaustion.

*Post-mortem examination.*—Spots of purpura on the abdomen; lungs, lobular suppurating inflammation; liver covered with spots of ecchymosis; kidney had numerous points of suppuration; mucous membrane of bladder ecchymosed; brain in same condition.

CASE 113.—*Carbuncle; pyæmia.*

John M—, æt. 45. Had a large carbuncle at the back of the neck. Incisions were made in it, and the man rapidly died.



*Post-mortem examination.*—Small masses of lobular pneumonia in both lungs; also numerous spots of extreme congestion; layer of lymph covering the outer surface of the left lobe.

SERIES VIII.—*Pyæmia following disease of the ear and temporal bone.*

It is well known how frequently a long-standing otorrhœa, connected with disease of the internal ear, terminates by implication of the brain. We have here, however, four cases where death occurred by way of pyæmia through infection of the blood. This might occur by two channels—through the vessels of the affected bone, or more immediately through the blood of the lateral sinus which is involved by contact; in the following the latter was a very evident and direct channel of infection.

CASE 114.—*Diseased ear; pyæmia.*

George L—, æt. 23. Admitted very ill with pneumonic symptoms. He had disease of the temporal bone, arising from chronic otitis, but had been ill only three weeks.

*Post-mortem examination.*—Lateral sinus next to diseased temporal bone had an adherent clot, which was softening in the centre. The adjacent dura mater of a greenish colour; but the brain not affected. Both lungs had suppurating lobular pneumonia.

CASE 115.—*Diseased ear; pyæmia.*

John R—, æt. 52. Had long had disease of the temporal bone, when he was seized with ordinary pyæmic symptoms.

*Post-mortem examination.*—An abscess extended down the neck from the ear; and the jugular vein was filled with a purulent coagulum; the bone necrosed, and lateral sinus full of softening clot; brain unaffected. Both lungs showed sloughing pneumonia and pleurisy.

CASE 116.—*Diseased ear; pyæmia.*

Alfred R—, æt. 21. Had had otorrhœa for four years, arising from a blow on the right ear. A week before admission he was seized with shivering, vomiting, &c. He continued very ill, with constant rigors, and the neck became much swollen; pleuropneumonia then became manifest, and subsequently pneumo-thorax occurred; the patient dying seventeen days after the attack.

*Post-mortem examination.*—Brain healthy; temporal bone necrosed; the adjacent dura mater of a green colour; and lateral sinus filled with a clot, softening into a creamy fluid. The same condition found also in jugular vein. Both lungs showed purulent pneumonia and pleurisy; and in right was an abscess which had burst, producing pneumo-thorax.



CASE 117.—*Diseased ear ; pyæmia.*

James B—, æt. 17. He died in the taking-in room, from pneumo-thorax. He had had otorrhœa of the left side all his life. Two weeks before his death he was taken with a pain on the left side of the neck, accompanied by febrile symptoms and rigors.

*Post-mortem examination.*—The left petrous bone was found much diseased ; the dura mater over it sloughing, and the brain opposed to it of a greenish colour. The jugular sinus full of softening clot, which continued down into the vein. Left lung collapsed, and containing a large rent from the sloughing of the tissue ; it contained also several masses of disorganizing pneumonia. The right lung also contained large masses of lobular pneumonia, and the surface of these covered with lymph. The jugular vein filled with softening clot, and its walls also inflamed and occupied by lymph.

SERIES IX.—*Pyæmia following suppuration of eye and orbit.*

We have three cases where the source of purulent infection was the eye, the morbid matter being carried along the cavernous sinus to the jugular vein. In all of them the symptoms were of the severest description, and in two the brain was affected. In Case 73, described in Series IV, it will be seen that the eye was secondarily affected.

CASE 118.—*Suppuration of eye ; pyæmia.*

Charles C—, æt. 22. Came to the hospital with suppuration of the left eyeball, and exceedingly ill. He was delirious and unable to give any account of himself, and his friends were not aware that he had received any injury. (He was employed amongst horses.) He got rapidly worse ; swelling and suppuration of the joints came on, and subsequently he had very fetid expectoration. All the symptoms of pyæmia were well marked from the beginning ; and thus there was little doubt that the disease had travelled backwards along the cavernous sinus.

*Post-mortem examination.*—There was suppuration in the left orbit, and globe itself disorganized, together with inflammation of that side of neck and face. Extending from the eye, the matter was found to fill the cavernous sinus, but the larger sinuses were unaffected, as well as the jugular vein. The whole superior surface of the brain was covered with dirty-coloured, purulent fluid ; and the left anterior lobe was in a state of softening. Both lungs were filled with abscesses and sloughy cavities, and both covered with lymph ; bronchial tubes inflamed and full of mucus ; the cellular tissue around the larynx was infiltrated with pus ; liver had numerous small red patches as if in early condition of lobular hepatitis.



CASE 119.—*Suppuration of eye ; pyæmia.*

Elizabeth S—, æt. 21. Sent to the hospital for erysipelas. The face was red and swollen, especially about the neighbourhood of the eyes, which were acutely inflamed. It soon became evident that suppuration was going on in the globe, and, from the subsequent cerebral symptoms, that the inflammation had extended to the brain. She died on the sixth day after admission.

*Post-mortem examination.*—There was suppuration around the globe of the eye, and the integument was infiltrated with pus; the ophthalmic vein contained pus, and this continued into the cavernous sinus. The inflammation had involved all the contiguous parts. Thus there was acute meningitis of the surface of the brain; the arachnoid itself was covered with lymph, and also the external surface of the dura mater, which rendered it slightly adherent to the cranium. The left lung contained a few small abscesses, and the surface was covered with patches of lymph; the right lung had more recent lobular pneumonia.

CASE 120.—*Suppuration of eye ; pyæmia.*

A young man, æt. 20. Four days before his death he was taken with shivering, which he styled a cold, and at the same time the right eye was inflamed. This soon went on to suppuration. When admitted to the eye-ward, suppuration of the eyeball and orbit existed, and he rapidly sank, there being little doubt that the disease had extended inwards as phlebitis. There was no history of injury.

*Post-mortem examination.*—Although the body was yet warm, the staining of the veins on the surface had commenced. There was suppuration in and around the eyeball, which extended to the cavernous sinus; this contained a softening clot of blood and pus, and which continued into the sinuses of dura mater, brain itself unaffected. Lungs showed lobular congestion, and no actual pneumonia; heart covered with purpurous spots; liver also had patches of a dark colour on its surface; spleen very soft.

SERIES X.—*Pyæmia following burns.*

Cases of burn, if not immediately fatal, terminate very frequently by inflammation of the lungs; but whether the latter be due to any purulent infection of the blood, or from any more direct sympathy between these organs and the skin, is not very evident. We can scarcely give an opinion as to the frequency of pyæmia as a result of burns and scalds, as a very large number of very careful inspections would be required. Our experience, however, as far as it goes, is of the same kind as that generally held—that pyæmia is far less common than might be expected from the extensive nature of the wounds often witnessed after these injuries. We give four cases; in the



last two pyæmia evidently existed ; in the former two the blood was affected in a different manner by a fibrinous material, and to these latter we shall presently allude in Series XVII.

CASE 121.—*Burn ; fibrinous masses in kidneys.*

Jessie A—, æt. 3. Died fourteen days after a burn. The lungs were covered with purpuric spots ; the spleen spotted ; and the kidneys contained some fibrinous masses in the cortical substance.

CASE 122.—*Burn ; fibrinous masses in kidneys.*

Alfred C—, æt. 6. Died a month after a burn. Lungs had early stage of lobular pneumonia, and surface ecchymosed ; kidneys large, swollen, and uneven ; and cortical substance occupied by effusions of blood and masses of fibrin.

CASE 123.—*Scald ; pyæmia.*

Ellen F—, æt. 15. Scalded on lower part of abdomen and thighs, producing a large ulcerated surface. Died after six weeks, of lobular pneumonia.

CASE 124.—*Burn ; pyæmia.*

John S—, æt. 14. Burned in various parts of the body, from which he died in three weeks. The posterior parts of the lungs were consolidated, one by red and other by gray hepatization ; the inflammation was not uniform, being more advanced in some lobules than others.

SERIES XI.—*Pyæmia following uterine affections ; puerperal fever.*

This is not the place to discuss the nature of puerperal fever ; but as we have extracted all the cases from our records touching the subject of pyæmia, we find a certain number have their origin in the uterus when in the impregnated state. It is known that the contest has sometimes raged violently between the rival opinions of puerperal fever being a disease *sui generis*—a kind of puerperal typhus—and its being simply a pyæmia, the raw or sloughy uterine cavity corresponding to a similar condition of a stump after amputation. There can be no doubt that such cases as these constantly occur, and which are evidently pyæmic ; but it might be argued that they should be rather taken as exceptions to a rule, than examples of it ; it certainly being true that in a very large number of cases of



puerperal fever, the results in the internal organs are seldom so emphatically marked as in pyæmia. Our own opinion, however, is that this is due to accidental causes, and that the diseases are identical; moreover, we have never seen how the apparently conflicting opinions as to its local origin on the one hand, and its contagious nature on the other, are really opposed. We think, indeed, that such opinions can be reconciled and held in unison.

The reason why, in the following cases, the post-mortem appearances are unusually well marked, is probably from the fact that, being somewhat more chronic in their character, they were capable of being removed into the hospital, whereas most cases of puerperal fever dying in our "Charity" are fatal in two or three days. The reader's own bias will influence him, in his estimation of the following cases, whether they should be regarded as examples of puerperal fever or not.

#### CASE 125.—*Pyæmia following labour.*

Ann S—, æt. 23. Eight weeks before admission she was delivered of her first child. She had a good labour, suckled her infant; and the lochia, which were very offensive, continued for three weeks. At the end of this time she was seized with pain in the legs, which became also swollen and red, the affection being styled erysipelas. She became also very ill and delirious, and subsequently an abscess formed in the hip and foot. On admission she was wasted, as if long ill; the abscesses were discharging, and others were appearing on the opposite leg. She gradually sank.

*Post-mortem examination.*—Various abscesses on the body, but no bone or joint affected. The uterus showed the internal surface covered with dirty-coloured secretion; the spermatic and uterine veins healthy, as well as the iliac; ovaries healthy. Left lung had a sloughy mass in the lower lobe, and lymph covering it.

#### CASE 126.—*Pyæmia (?) following labour.*

Ann L—, æt. 21. Four days before admission she was confined of a seven months' child; and she came in with pleurisy and peritonitis, of which she died in two days.

*Post-mortem examination.*—Uterine veins contained a dirty-coloured, creamy fluid, like pus; acute general peritonitis; acute pleurisy on right side; lungs purpuric on surface.

#### CASE 127.—*Pyæmia (?) following miscarriage.*

Emma P—, æt. 34. She was admitted with Bright's disease; but was at the same time pregnant, and soon after aborted of a five months' child. She rapidly sank, and died on the sixth day.

*Post-mortem examination.*—Uterus soft, and interior pulpy; but no pus discoverable



in the veins. Part of the upper lobe of the lung in a state of gangrene, very fetid, and of a green colour, and incipient inflammation around; chest contained about a pint of greenish purulent fluid.

### CASE 128.—*Pyæmia following labour.*

Elizabeth B—, æt. 34. Seven weeks before admission she was confined, and two weeks afterwards the knee and thigh became painful. Subsequently an abscess opened outside the knee, and the suppuration continued. Amputation was thought of, but the patient was too low to bear the operation, whilst the suppuration was almost too extensive to admit of it.

*Post-mortem examination.*—Right knee-joint quite disorganized, and filled with fetid, purulent matter; no affection of veins of leg, pelvis, or uterus. Lungs in early stage of red hepatization. Other organs healthy.

### CASE 129.—*Pyæmia (?) following labour.*

Catherine G—, æt. 20. She had been married four years, but, from having a small pelvis, premature labour was induced in her second pregnancy. On her again becoming pregnant, and fearing the consequence, it was thought advisable that the operation should again be performed. At the expiration of the sixth month the membranes were punctured, and the liquor amnii drawn off. Five days afterwards the child was removed by turning, it having been dead apparently some days. After this she had a good deal of hæmorrhage and fetid discharge; rigors came on, and in a few days she died,—the ninth after the operation.

*Post-mortem examination.*—Uterus very soft; the cellular tissue around cervix contained purulent matter, the interior, as well as that of vagina, being dark green, fetid, and sloughy. The whole of placenta had been removed. Lungs showed lobular congestion, but no actual pneumonia.

### CASE 130.—*Pyæmia following labour.*

Hannah R—, æt. 21. Died of puerperal fever two weeks after labour. The body showed a number of vesicles filled with opaque fluid on the surface, and one or two on the face. Acute general peritonitis, purulent fluid in large quantity being present. Uterus very soft, and interior almost sloughy. Vagina in one or two places ulcerating. In right lung a large sloughy mass, but no recent pleurisy; all the other organs very soft. Pelvic veins healthy.

### CASE 131.—*Pyæmia following labour (puerperal fever).*

Woman, æt. 36. Was confined ten days before her death. She had a natural labour; but two days afterwards her milk left her, and fever came on. Subsequently, there was pain in the left leg and swelling of the right knee. There was also diarrhœa and vomiting.

*Post-mortem examination.*—Left leg swollen, and on it a few vesicles. The surface of intestines felt slightly greasy, but there was no other evidence of inflammation; inner surface of uterus sloughy, and the veins contained some purulent matter.



Pelvic and iliac veins had ordinary soft coagula. The liver had a large red patch on its surface, which extended into the substance of the organ, and spread outwards in the course of the portal veins; there were also two similar but smaller spots, as if the blood had stagnated in the tissue. Spleen also presented some red patches like those in the liver. Lungs highly congested and spots of very dark colour in posterior parts.

SERIES XII.—*Pyæmia connected with erysipelas.*

One of the most important diseases connected with the subject of blood-poisoning (as it is called) is erysipelas. This affection has perhaps attracted more attention than almost any other, from the time of Hippocrates to the present age, and the most celebrated physicians and surgeons have recorded their experience regarding it. The various questions discussed have been whether the affection, when attacking the surface, was a peculiar one, or a simple inflammation of the skin; whether the local affection produced the constitutional, or whether the former was not a mere manifestation of an internal unhealthy condition. It was also discussed whether the internal organs might not be affected by the same peculiar erysipelatous inflammation, or whether such complication arose from secondary causes. Then also came the war of treatment between the antiphlogistic and the stimulating methods. It would have been exceedingly pleasant could we have decided some of these questions. As regards the internal inflammations mentioned by Hippocrates and his successors, we think in very many cases these were due to pyæmia, the erysipelatous abscess acting as any other source of infection. We would not, however, deny the possibility of the existence of an erysipelatous pleurisy or peritonitis, since it will be seen that in the next list of cases we have given two bearing on this subject; as, however, it might be suggested that the very violence of the inflammation on the exterior of the abdomen might have lit up a similar inflammation within the body, we have put in juxtaposition with them a case where peritonitis resulted from an extensive burn on the abdominal walls. Our experience, we confess, is slight in reference to the mode of death from erysipelas, since it is a disease now rarely fatal, which fact, indeed, is sufficient to prove beyond all controversy the superiority of the stimulant method of treatment over the older



antiphlogistic ; and, indeed, may be regarded as one evidence of the blood-disease : whether this be a cause of the local inflammation, or a result, need not be included in the decision. The only question, we think, which can arise as to the accuracy of this judgment is in reference to the diagnosis of the disease, and especially to this point,—How is it that years ago (not many, for the popular notion still obtains) the importance of an accident or injury was measured not so much by its severity, as by the liability of an accession of erysipelas ? The usual certificate to a magistrate in reference to such case was that no fear need exist unless erysipelas ensue. Erysipelas was considered, indeed, the bane of hospitals. Now it is no longer feared ; with us it is very rarely fatal, thanks to the better ventilation of the wards, good nourishing support, and the stimulant treatment. We think, however, that another explanation must have its weight arising out of the curious circumstance, that as formerly erysipelas was the affection feared after an injury or operation, now it is phlebitis or pyæmia. Have diseases changed places, or merely changed names ? For our own part, we think it highly probable that when a stump of a limb or other wound sloughed, and a blush of redness appeared about it, death was put down to erysipelas ; whereas now, from our more extensive researches in morbid anatomy, such event would be attributed to pyæmia. Rather than think disease has altered its character, we would consider that erysipelas is less rife owing to preventive measures ; also that when it exists it is cured ; and that formerly much error was made in the frequent misnaming the disease.

As regards erysipelas being a source of pyæmia, we have said that most cases of simple erysipelas recover ; but if a phlegmonous erysipelas terminate in suppuration, a sufficient source of infection is clearly present—such as in the cases given. The most important cases in this next series have perhaps only a questionable relation to erysipelas. They are cases which terminated fatally by a diffused suppuration of the neck, implicating at the same time the throat internally, as well as the larynx. Similar cases have been before described, and generally as a form of erysipelas. There need, however, be no redness of the surface, but merely a swelling indicative of the inflammatory effusion or suppuration, and which is found after death to have



occurred amongst the muscles and cellular tissue of the neck. This external suppuration has combined with the laryngeal inflammation to cause death sometimes by suffocation. In other cases the blood has evidently been affected after the manner of pyæmia; and this is the reason why we could not pass by such cases when treating of this subject. It is possible that an injury might produce the affection by absorbent inflammation; but after removing all known causes, cases are met with in which the disease appears to be spontaneous, and thus, we suppose, the term erysipelas is adopted. The propriety of its use would depend much upon the opinion of the reader, as to erysipelas being a simple or a peculiar inflammation. The last six cases of the following series are of this kind; and therefore we have placed them together, that their character may be better judged of.

CASE 132.—*Erysipelas ; pyæmia ; exhaustion (?)*.

John L—, æt. 40. He said that four days before admission his leg began to swell without any assignable cause, and increased until admission. He was very ill; the whole of left leg and thigh were enormously swollen and red as in phlegmonous erysipelas. Incisions were made, and a dingy, serous fluid escaped, no pus having yet formed. He gradually grew worse, and died two days after admission, and six after the attack.

*Post-mortem examination*.—There was no disease found in the body; the lungs at posterior parts congested and soft.

CASE 133.—*Erysipelas ; pyæmia (?)*.

John C—, æt. 49. Operated on for hernia, without opening the sac. He was immediately relieved, and was convalescent when erysipelas came on, and subsequently pneumonia; dying sixteen days after the operation.

*Post-mortem examination*.—A very fat man; lungs ecchymosed, and some recent lobular pneumonia; also whole of one lung uniformly hepatized.

CASE 134.—*Burn ; peritonitis*.

Henry S—, æt. 2. Had burn over abdomen, from which he died at the end of the fourth week. He was suddenly taken ill two days before death.

*Post-mortem examination*.—Acute general peritonitis; lungs congested.

CASE 135.—*Erysipelas ; peritonitis*.

Benjamin F—, æt. 27. Whilst at work, he struck his leg; followed by swelling in groin and suppuration. The sores did not heal, but the sinuses remained. The disease was not believed to be venereal. On one or two occasions, incisions made



for the purpose of healing the sores. At last erysipelas appeared, and spread along the thigh and over the abdomen, producing great constitutional disturbance, and he died in five days.

*Post-mortem examination.*—Leg swollen, but no purulent matter yet formed; acute peritonitis affecting the whole of abdomen. A very careful examination was made in order to discover if there was any local cause for the inflammation, but none was found.

### CASE 136.—*Erysipelas ; peritonitis.*

John J—, æt. 34. Was in hospital with hepatic affection, when erysipelas came on, involving legs and abdomen, and he quickly died.

*Post-mortem examination.*—Liver in early stage of cirrhosis; acute peritonitis of whole of abdomen.

### *Cases of diffused suppuration in the neck.*

CASE 137.—George A—, æt. 62. He had an ulcer on the lip, and an enlarged gland below jaw; it was thought to be epithelial, and was removed by the knife. It was nearly well when inflammation of the neck came on, followed by diffuse suppuration febrile symptoms, &c., and he died in six days.

*Post-mortem examination.*—All the organs healthy, showing no acute nor chronic disease; all the muscles about the throat infiltrated with pus.

CASE 138.—Mary Ann S—, æt. 32. Was suffering from diseased heart, kidneys, &c. A few days before death, her neck became inflamed, causing much swelling of throat and difficulty of breathing. It was a question whether it should be styled erysipelas.

*Post-mortem examination.*—The neck swollen, and its muscles and cellular tissue infiltrated with pus; there was also inflammatory œdema of the mucous membrane of the larynx.

CASE 139.—Thomas C—, æt. 66. Entered the hospital with swelling of the neck and great difficulty of breathing, with an obscure history of injury. It had been present a few days, and his friends had styled it erysipelas. Tracheotomy was at first suggested; but incisions were merely made in the neck, from which serum escaped.

*Post-mortem examination* showed infiltration in the cellular tissue, amongst the muscles, and in the muscular tissue itself; the glottis swollen so as to be nearly closed.

CASE 140.—William W—, æt. 33. This man was said to have been ill three or four days. He had been riding outside a coach, and got cold, complaining subsequently of pain in the shoulder. A swelling shortly afterwards appeared in the neck and chest, which was said not to be erysipelatous; he then soon became very ill and delirious. An incision in the chest did not cause the evacuation of any pus. After this he rapidly sank.

*Post-mortem examination.*—Acute suppuration in muscles of chest and neck of right side. The tissues were infiltrated, but there was no circumscribed abscess, and there was no mark of injury; acute pleurisy of whole of right side; lung itself healthy.



CASE 141.—Abraham S—, æt. 36. Admitted into the hospital extremely ill, with great fever; skin hot and dry; flushed face, &c. Right arm and shoulder very painful, but no fluctuation to be felt. Eight days before, he had had his finger crushed, but no absorbent inflammation of the arm had been observed to follow. He subsequently became lower, complained of his throat and a sense of suffocation, and died four days after admission.

*Post-mortem examination.*—Body very offensive, from decomposition having set rapidly in after thirty hours; there was diffuse cellular inflammation in the chest and in the pectoral muscles; the latter were infiltrated with pus, which extended also into the laryngeal muscles and anterior mediastinum. The veins in the neck and arm were free; blood dark and fluid; no visceral disease.

CASE 142.—Thomas C—, æt. 70. Admitted with a swelling about shoulder, which at the end of three weeks appeared to have subsided, when difficulty of breathing came on, and the man died three days afterwards.

*Post-mortem examination.*—The muscles of the neck and larynx were infiltrated with pus, and the mucous membrane itself inflamed. It was a question at the time whether the inflammation could be styled erysipelalous.<sup>1</sup>

### SERIES XIII.—*Pyæmia following gangrene.*

Gangrene is said to kill by exhaustion, but when of the moist or inflammatory kind the blood may be infected, as in the following case.

#### CASE 143.—*Gangrene ; pyæmia.*

John S—, æt. 74. Senile gangrene of the leg, and slowly sank.

*Post-mortem examination.*—Lungs in state of lobular inflammation; liver fatty.

#### CASE 144.—*Gangrene ; exhaustion.*

John B—, æt. 67. Had senile gangrene of the left foot, this being dry and withered. He continued in the hospital four months, until the bones became exposed and dry, and the integuments and tendons resembled pieces of hempen cord. He gradually sank. No disease in the body was found, except senile changes in the heart and arteries.

---

<sup>1</sup> A very similar case to the above we lately saw in consultation with Mr. Vinen, of Horsleydown. The patient was about fifty years of age, a free liver, much depressed in spirits, and evidently not of sound constitution. Five days before we visited him his neck became swollen without any apparent cause, and this part gradually increased until it was of great size, and he appeared in danger of suffocation. He was sitting up in bed, much distressed, could scarcely open his mouth from diffused swelling over the chest, neck, and beneath the jaw. The skin was slightly red, pitted on pressure, but no fluctuation was to be felt. Subsequently one or two incisions were made, but no pus followed. He rapidly got worse, and died a week after the commencement of the attack.



SERIES XIV.—*Pyæmia following phlebitis.*

We have before said that it is quite the exception to discover phlebitis as a cause of infection, and thus the older term has given place to pyæmia. So long as the morbid material is taken up by the circulating fluid the result is accomplished, and, therefore, if a vein be involved in an inflammation, this phlebitis will be a very clear cause for the infection. Thus, amongst various causes of pyæmia, phlebitis may take its place, although it is very remarkable how seldom the veins can be found affected. We have seen how the jugular sinus is involved in disease of the ear, and thus the blood contaminated, but the best marked cases are those where a vein has been injured, as in Case 147. So far from phlebitis being a cause of pyæmia, it is remarkable how often the former occurs without any contamination of the blood whatever; that is, if we can call that phlebitis where we find a vein and its branches quite closed by coagulum or adherent fibrin; and this, indeed, is another proof of the truth of the observation before made, that the simple coagulation or formation of fibrin in the blood is not in itself sufficient to produce pyæmia; that this process in itself is not enough; it requires rather that some smaller veins should open into a spot where inflammatory action is going on, or, if a larger vein be the source, that its walls be involved in a suppurative process.

It will be seen how few cases could be discovered amongst our large number showing an affection of the vein as a cause of pyæmia.

CASE 146.—*Phlebitis ; pyæmia.*

Daniel B—, æt. 40. For a few weeks before admission he had been ailing, but without any very distinct symptoms. He was then in a feverish state, his skin yellow, and his left leg swollen and painful. No visceral disease could be discovered, and it was doubtful what was the nature of the complaint. He continued daily to sink, and subsequently the other leg became swollen. Died at end of a month after admission; never had rigors.

*Post-mortem examination.*—A large abscess existed in right loin and iliac region, extending along the spine and passing down the thigh; no bone affected. Both femoral veins filled with adherent clots of a pale colour, and the centre softening. Lungs contained masses of gray, consolidated tissue, and over these were patches of recent lymph.



CASE 147.—*Phlebitis ; pyæmia.*

James F—, æt. 30. He received a stab with a knife on the left side of the neck, and which wounded the internal jugular vein. Much hæmorrhage ensued, and which never entirely ceased until his death, on the nineteenth day. No operative measures were adopted except enlarging the wound and applying pressure on the vein. On the ninth day he had rigors, febrile symptoms, and cough ; all these continued, and he daily sank.

*Post-mortem examination.*—The jugular vein was cut through for half its circumference. The coats of the vein were inflamed, infiltrated with lymph, and the interior occupied by an adherent clot as far as the subclavian. The cellular tissue also around the vein was involved, the suppuration extending into the anterior mediastinum. The lungs contained numerous abscesses, two as large as eggs, and the others smaller. Spleen had a small abscess on the surface.

CASE 148.—*Phlebitis.*

Mary H—, æt. 38. For two or three years she had suffered from uterine polypus, and this was at last removed by ligature. A constant purulent discharge followed, and she slowly sank, dying a month afterwards.

*Post-mortem examination.*—The right leg œdematous, left slightly so. A small phthisical cavity in the lungs. Uterus and ovaries in sloughy state, and peritonitis at lower part of abdomen. The pelvic veins were quite closed by firm, adherent fibrin, and the external iliacs in like manner ; also the vena cava, as high as the renal, filled with coagula.

CASE 149.—*Phlebitis.*

Adolph R—, æt. 54. Entered hospital with swelling of the left leg, and shortly died.

*Post-mortem examination.*—Left femoral vein filled with a clot reaching as high as vena cava ; also upper part of right iliac vein. The clot in vena cava adherent to the walls, and coats at one part appeared inflamed. Internal iliac veins filled with ante-mortem coagula, as well as all its branches ; the latter, including the vesical and prostatic, filled with coagula. The only local disease discoverable to account for the phlebitis was an enlargement of the left testis, which was inflamed, and accompanied by a suppuration about the spermatic cord. The rectum was healthy. Lungs showed merely the pneumonia of the dying.

The preceding cases are arranged according to the character of the original disease or accident, but the following, being only doubtfully connected with pyæmia, are placed separately.



SERIES XV.—*Death from exhaustion.*

The preceding cases are, for the most part, well-marked instances of pyæmia; some of them possess, indeed, but few striking post-mortem appearances; but from the symptoms manifested during life, and for other reasons, they have taken their places in the regular series. Although the poisoned condition of blood had been the main cause of death, yet exhaustion must have had its due share in the issue in very many instances. This term, although very ill defined, we are compelled to use, expressing, as it does, a well-known condition of system terminating in death. In some cases, where there has been no evidence whatever that the blood was infected, we have been obliged to use this term exhaustion, and since, we say, this cause may have been in operation in other cases where pyæmia undoubtedly existed, we have selected out those instances where the former alone was simply in operation to bring about the result. Of course, if the system be at all diseased, or any important organs be not in a healthy state, a powerful and manifest cause exists for the sinking of the patient, although the affection of these viscera may not have produced any characteristic derangements. Very often cases occur where it is difficult to select any one organ of the body as manifesting any very important disease, and yet the body, as a whole, presents a great departure from the natural standard. It is often difficult to define this in so many terms, although the eye will at once detect the difference. There is the body of the man who has been killed in the full vigour of health and that of the man who has been out of condition for a lengthened period. To the latter we may adopt the term cachectic, or some such term; notice his pale, impoverished muscles, sallow skin, liver-coloured patches on the legs; or we may observe an amount of fat on the body which we recognise as being above the natural standard; for example, a thick layer of yellow fat on a large abdomen, also an abundance within, and probably the liver, heart, and other organs containing an excess of oleaginous material. A man with these appearances, although he may have been employed up to the time of his accident, is in a very different condition from one with



a moderate amount of fat and a dark, well-developed muscle. The former is very likely to die from the effects of the injury or operation, and death is attributed purely to these, whereas the condition of the body has been the main instrument in bringing about the result. We think surgeons scarcely give themselves credit when, overlooking the condition of the body, they attribute death simply to an accident or operation. Thus we have repeatedly seen the reports of cases of hernia without any reference to the condition of the viscera, and although we know peritonitis is only too liable to be lighted up after the operation, yet we cannot but think that a predisposition exists should the patient be the subject of Bright's disease. Now, diseased kidneys we have constantly met with in old patients who have died from hernia.

CASE 150.—*Cellulitis ; exhaustion.*

Thomas W—, æt. 40. A fall from a height set up great inflammation of surface, followed by cellulitis and sloughing of whole of left side of chest and back ; he died at end of fourteen days.

*Post-mortem examination.*—No disease found in the body except hypostatic congestion of the posterior parts of the lungs.

CASE 151.—*Diseased joint ; exhaustion.*

Ann C—, æt. 40. She was admitted with acute disease of the knee-joint ; she suffered greatly with it, and was in a very feeble condition, so that she always appeared too ill for amputation ; afterwards a bed-sore appeared, and she gradually sank.

*Post-mortem examination.*—Knee-joint disorganized. No disease to be discovered in any part of the body.

CASE 152.—*Injury to hand ; exhaustion.*

Joseph P—, æt. 70. The right hand was crushed by a cart-wheel, and the integument was removed from the whole surface. The man was very feeble, heart's action intermittent, and he gradually sank, dying eleven days after the accident, the integuments of the hand having sloughed.

*Post-mortem examination.*—Except some slight senile changes, the internal organs were healthy.

CASE 153.—*Injury to leg ; exhaustion.*

Henry H—, æt. 56. A wheel passed over his leg, severely contusing it, and producing effusion of blood and much swelling. After lying in bed a few days it became absorbed, and he left his bed. Nearly a month afterwards the leg became



inflamed, the knee-joint swollen, and there was great constitutional disturbance. An opening was made, but the man fell into a typhoid condition, and he died four days after the accession of the symptoms.

*Post-mortem examination.*—No recent disease found. Liver fatty.

CASE 154.—*Removal of tumour ; exhaustion.*

Jane K—, æt. 50. A very fat, flabby, unhealthy looking woman, had a large steatomatous tumour removed from her back. She seemed much oppressed by the chloroform administered, and never rallied from the operation. She lay in a very low state for some days, and then rapidly sank, without any manifest symptoms, dying on the sixth day from the operation.

*Post-mortem examination.*—All the organs contained an excess of fat, and the kidneys were granular. No acute disease.

CASE 155.—*Abscess of leg ; exhaustion.*

William R—, æt. 74. Received an injury to the knee, ending in suppuration of leg and joint. After lying in bed in a very precarious condition for two months, he died.

*Post-mortem examination* showed no disease in the viscera except senile changes.

SERIES XVI.—*Fibrin carried through lungs into arterial system.*

We have stated at the commencement of this report that we consider the simple introduction of fibrin into the blood does not produce genuine pyæmia, but for the production of this disease purulent matter, or some of those inflammatory matters allied to it, are essential to its existence. In order to illustrate the fact we have here put together some few cases where fibrin circulated in the venous system, and fibrinous concretions occurred in the viscera in the place of purulent deposits or formations. A fibrinous coagulation may occur in connection with pyæmia, but the former, when existing in a vein without suppuration, may affect the blood in such a manner that the pulmonary arteries shall contain similar concretions, and then, through the lungs, the whole arterial system and the various viscera may be affected. If the cause for the fibrinous separation commence on the arterial side, as in the heart itself, the same well-known result is seen. For our own part, we should separate such cases from those of pyæmia, but being frequently included in them we have placed them in our record, at the same time arranging them in a series for the



sake of distinction. One peculiarity of these cases, in comparing them with those of pyæmia, is that, owing to the coagulation of the blood in the pulmonary artery, the vessel becomes sometimes entirely blocked, and death occurs through the lungs ; or by the heart suddenly ceasing to act. In Case 156 clots were carried from the pelvic veins to the pulmonary artery, causing speedy death by coagulation of the blood in this vessel. Case 158 is interesting as assisting in throwing light upon some obscure causes of death. This man received an injury to the lower extremities, and shortly died with extreme dyspnœa. The right side of the heart displayed nothing more than a very firm coagulum, but the symptoms during life suggested that this had been in formation ante mortem, from some material which had been carried to the heart and favoured its production. It is probable that a very small amount of this fibrin may act as a nucleus to a much larger coagulation, although, on examining the latter, the portions which promoted its formation may be undiscoverable. Generally, however, in the midst of the recent coagulum, small masses of pale fibrin may be discovered. In cases like 159 it may be difficult to account for the prime cause of the fibrinous concretions (whether from bronchitis or not), but it will be interesting to see that not only did they exist in the pulmonary, but (being carried, probably, through the lung) the viscera were also affected. Case 160 is placed in juxtaposition to show that the *primum mobile* may in some instances be in the lungs, although in the next case where disease of the lungs existed the origin of the coagulation was in the pelvic veins.

CASE 156.—*Gonorrhœa ; clot in pulmonary artery.*

Samuel S—, æt. 19. He was admitted with a chest affection, which appeared to be slight pneumonia; he was soon convalescent and able to sit up, when he was suddenly seized with great dyspnœa, and died in half an hour.

*Post-mortem examination.*—The pulmonary artery and its branches were filled with coagulum ; this was mostly firm and recent, but in some parts it contained white, soft portions, as if these had been the nuclei of coagulation. Left ventricle contracted and almost empty ; valves healthy. The vena cava contained a large ante-mortem clot, evidently older than that in pulmonary artery, being white and softening. The iliac veins were similarly affected, and all the veins about neck of bladder and prostate. It was then discovered that he had a gonorrhœa, with inflammation of prepuce, and considerable purulent secretion could be squeezed from the prostate.



CASE 157.—*Phlebitis ; clot in pulmonary artery.*

Elizabeth S—, æt. 41. She was in the hospital for phthisis, and during the last few hours of her life a remarkable congestion came over the surface of the body. She lay quiet on her side, and without any apparent increase of dyspnœa, but the face was of a deep-blue colour.

*Post-mortem examination.*—Right lung disorganized by phthisis; the left had a few scrofulous deposits, and its pulmonary artery was occupied by an adherent coagulum. This was beginning to soften in the centre, and portions, therefore, must have been at least of three or four days' formation. The ovarian veins were seen to be of very great size from distension with coagula, and on opening them the latter were closely adherent and the interior softening. The coagulum ceased at the vena cava. No cause could be found in the ovary or any other part of pelvis for the venous affection.

CASE 158.—*Injury to leg ; clot in pulmonary artery.*

Patrick K—, æt. 50. He fell from a wagon, and he said the wheels passed over his legs, but this was doubtful. They were much bruised, and some blood was effused beneath the integument, and the tibia exposed. He never rallied from the shock, but on the fourth day was seized with great distress of breathing; he was forced to sit upright in bed, showing signs of the greatest oppression and anxiety; the heart beat quick and feebly. No pulse could be felt at the wrist for the last three hours of life. It was surmised by Mr. Hilton, during life, that a coagulum was forming in the right ventricle.

*Post-mortem examination.*—The body, which lay all night in the dead-house, the weather being at the time frosty, was, after twenty hours, so frightfully decomposed, that it could not be recognised; it was also generally emphysematous from the production of gas, the internal organs included. Lungs healthy. Heart contained in its right side a large clot, much more tenacious than commonly found, adhering strongly to the walls, and constituted one mass with that in the vena cava and pulmonary artery. The coagulum, in structure, was of the ordinary post-mortem kind, or such as is known to occur during the dying hours, presenting no softening nor any appearances usually seen in the so-called ante-mortem clot. From examination of the injured limbs it could not be positively ascertained that any fibrinous matter had been introduced into the femoral veins.

CASE 159.—*Bronchitis ; clot in pulmonary artery.*

A woman, æt. 30. She was suckling a child of four months, and was just recovering from an attack of bronchitis, so as to be able to resume her work and go out. She again, however, got cold, and in a few hours' time was suffering from great dyspnœa, and was then admitted into the hospital. She was gasping for breath; had great lividity of face and hands; the chest was resonant, and throughout it there were râles. She died on the third day of the attack.

*Post-mortem examination.*—Bronchial tubes filled with secretion; numerous lobules highly congested, almost apoplectic; in right side of heart was a firm clot,



which passed into the minutest ramifications of the pulmonary artery; the spleen contained a large fibrinous deposit, and the kidneys also some small fibrinous masses; the valves of heart healthy.

CASE 160.—*Bronchitis; fibrinous clots.*

Maria B—. Died of bronchitis and dropsy; lungs apoplectic; spleen contained white, fibrinous mass.

SERIES XVII.—*Fibrinous concretions in arterial system and viscera.*

The few cases which we now propose to give are very different from those of pyæmia, but the examples in the last series will show that a connection exists, forming, as those do, a link between the present and those of pyæmia. We have said that if purulent elements, or materials allied to them, should be carried into the vena cava, and so to the lungs, that abscesses will be there formed, and perhaps also in the other viscera; also, that not only may the morbid material cause a coagulation in the minute pulmonary vessels, but occasionally this may occur in the main trunk itself. It appears to be not so much the purulent matter which causes this coagulation in the pulmonary artery as portions of fibrin, which tend to propagate the same fibrinous concretions wherever they deposit themselves. Thus, in the last series of cases it will be seen that a coagulation in the pelvic veins was a frequent cause, and that if fibrin in small quantities was carried into the arterial system that similar formations occurred in the viscera. Just as pus propagates pus, so does fibrin appear to produce fibrin. In the present series we relate a few instances where the fibrinous concretions occurred on the arterial side of the circulating system. These cases must be well known to pathologists, but we think are scarcely yet rightly understood; we ourselves do not profess to show the cause of the affection, but we consider that the *primum mobile* being always placed in the heart, as resulting from an endocarditis, has not been proved. It is undoubtedly true that, if from any cause fibrin should appear in the blood, that this will form a centre for a fresh deposition elsewhere. In the last series the fibrin appeared to have been carried from the venous side; it also



may originate in the heart when the valves are diseased. If these be, for example, inflamed, a fibrinous coagulation will occur upon them, and if any fragments of fibrin be carried away fresh deposits are liable to occur. In cases of acute rheumatism, where we know the heart is so liable to be inflamed, the commencement of the process may easily be understood to commence here; but if no such history of cardiac disease exist, we consider it to be an assumption to declare that in every case where fibrinous deposits are found in the viscera and on the valves of the heart that the process commenced necessarily on the latter; much less should it be assumed, when the heart is not affected, that fibrinous concretions have once been there and washed off. It has not yet, indeed, been shown that the blood itself may not be diseased so as to contain such an excess of fibrin that this is readily precipitated, and, amongst other places, on the cardiac valves. There is very little doubt that this condition of blood favours the deposition of vegetation on the valves in rheumatism. We shall not augment the size of this report by relating any cases of endocarditis with fibrinous concretions in the organs; these are too well known to require repetition, but we will give merely a few cases where the starting point was not clearly in the heart. In the second case given, No. 162, we are of opinion that the cause of the tendency to coagulation existed in the blood, due to the patient's cachectic condition, it being well known that a depressed state of the system will produce an increase of fibrin in the blood. In Case 161 it was thought that vegetations had existed on the heart and been washed off; two other cases are also given bearing on this subject. That a diseased condition of blood, in which an excess of fibrin exists, may be the real cause of the fibrinous depositions, rather than an endocarditis, receives additional corroboration from cases of burn. We have been informed by chemists that in cases of burn an excess of fibrin exists in the blood, and in connection with this circumstance we would refer to Nos. 121 and 122, where fibrinous masses were found in the spleen. In relating these cases we do not deny that a portion of fibrin, being once deposited in any part of the arterial system, may cause similar concretions elsewhere, but in absence of this we should not assume it. We do not wish to weaken the doctrine of embolism,



although our own experience is certainly limited in reference to it; we do not, for example, in every case of softening of the brain, where the blood-vessel is obstructed, place the cause of the disease in the heart, because the valves may be likewise affected. In very many of such cases the obstruction of the cerebral vessel has originated within it, either from disease of its walls or from previous stagnation in its branches, owing to disease in the cerebral structure. That a plugging of a vessel is secondary to the affection of the viscus which it supplies, and not primary, we have several times observed, as, for example, when, in cardiac apoplexy of the lung, the pulmonary arteries become filled with coagulated fibrin, or when fibrinous concretions in the spleen produce a coagulation in the vessels leading to them; in the latter case, the material which is carried in the blood obstructs merely the capillaries, and the trunk is closed afterwards.

We must check ourselves in pursuing the subject of blood diseases further, or we should be led to consider many other diseases allied to pyæmia. We cannot, however, refrain from remarking how many symptoms in common many of those affections have, such as scarlatina, pyæmia, and rheumatism. The latter disease resembles to so great a degree the lesser effects of purulent infection that it is often difficult to diagnose between them; and as regards the so-called gonorrhœal rheumatism, there are some who consider the disease so little characteristic that they regard it as a mere chronic form of an ordinary arthritic affection. Again, closely allied to rheumatism, we have scarlatina, the pains and swelling of joints being well known in the progress of this disorder; indeed, in the tropics the two affections are so often associated as to necessitate the expression *scarlatina rheumatica* for a particular form of disease. It does not, therefore, seem surprising that in this exanthem we should have results similar to those witnessed in the joint affection, and thus we frequently find fibrinous deposits in the organs, especially in the kidneys. In reference to this it might be said that these are the organs which are specially affected in this disease, or on which the morbid poison falls; but we should state that the scarlatinal nephritis (if the term may be used) is evidenced by an inflammation of the struture, whereby the tubules especially are in-



volved, whereas we now allude to cases where fibrinous material is poured out from the blood, and is deposited in the cortical part of the organ. We should attribute this rather to some morbid condition of blood, as, probably, an excessive fibrinous condition, rather than a result of simple nephritis, since we do not recognise the process in ordinary inflammation resulting from other causes, as in acute renal dropsy. We therefore append a few cases of scarlatina in illustration.

#### CASE 161.—*Fibrinous deposits in organs.*

Caroline R—, æt. 34. She had been in a state of great poverty, and dated her illness to a fortnight before admission, with rigors, &c. She was very prostrate, in high state of fever, and respiration hurried. She subsequently had blebs of pemphigus appear on the body; pains in the joints, and a cardiac bruit became audible. All these symptoms continued, with delirium ten days after admission.

*Post-mortem examination.*—Slight recent pleurisy; the mitral valve was slightly rough, but no actual vegetation; in right ventricle was a firm clot, extending into the smaller branches of the pulmonary artery; the spleen contained a softening, fibrinous mass; in the kidneys were similar masses.

#### CASE 162.—*Fibrinous deposits in organs.*

Thomas E—, æt. 21. When admitted into the hospital he had just been dismissed from prison, and was very ill. He was extremely low, but nothing was apparently the matter with the heart.

*Post-mortem examination.*—On opening the heart there was seen a vegetation hanging from each aortic valve, and easily detached; there was no appearance of endocarditis. Lungs.—The right had numerous portions solidified, and in the upper lobe was a mass breaking down, producing an irregular cavity; below this several parts were solidified by deposits, and surface covered with lymph. Spleen had white, fibrinous deposits, and the kidneys four or five of a similar character; liver fatty.

#### CASE 163.—*Fibrinous deposits in organs.*

Michael R—, æt. 23. He had been ill for some weeks with psoas abscess; subsequently the leg became swollen, and the foot gangrenous.

*Post-mortem examination* showed disease of the ileum; the femoral artery of the affected leg was found to be closed by a firm, fibrinous clot adherent to the walls; the spleen contained large, fibrinous plug; both kidneys also contained similar masses; valves of heart healthy; slight pleurisy of both lungs.

#### CASE 164.—*Fibrinous deposits in organs.*

Michael R—, æt. 57. This man was under treatment for three months, and had been ill two months before that. He was evidently very unwell, but his only com-



plaint was pain in the left side. He at last sank into a comatose state, when his urine for the first time was found to be albuminous.

*Post-mortem examination.*—The lungs were healthy; in the heart large vegetations were seen hanging from the aortic and mitral valves. The left kidney contained a large, fibrinous mass, the renal vein contained a coagulum, and the adjacent vena cava; the right kidney also had a fibrous mass.

#### CASE 165.—*Scarlatina ; fibrinous deposits.*

Maria G—, æt. 10. Admitted at the termination of an attack of scarlatina. The child was extremely feeble, and in a condition which is commonly called typhoid, the tongue being brown, &c. The skin subsequently desquamated. Stimulants were given, but she gradually sank, dying ten days after admission, and probably about three weeks from the commencement of the fever.

*Post-mortem examination.*—The pharynx and upper part of larynx showed the existence of a former inflammation, being much congested, with one or two small spots of ulceration, a few patches of lymph on the pleura, and also some slight films on the pericardium; kidneys very large, weighing eighteen ounces, soft, and, shown by microscope, to be the subject of nephritis; besides this, however, they contained two or three distinct deposits of fibrin in the cortical structure, conical in form, and presenting the usual appearance.

#### CASE 166.—*Scarlatina ; fibrinous deposits.*

Charles W—, æt. 3 $\frac{3}{4}$ . This child was seized with scarlatina on November 11th, with great affection of throat. The latter continued for some time, when, on the 21st, he was much better; subsequently sank, and died on December 1st.

*Post-mortem examination.*—Patches of lymph on pharynx, and some purulent infiltrations in neck; kidneys weighed three and a half ounces. The microscope showed the structure to be little affected, but each organ contained three or four fibrinous, wedge-shaped masses.

#### CASE 167.—*Scarlatina ; fibrinous deposits.*

Laura R—, æt. 6. Admitted with scarlatina, and died at expiration of three weeks. No particulars of history.

*Post-mortem examination.*—Purpurous spots on abdomen; suppuration in neck; slight pleurisy and peritonitis; spleen contained a pale-yellow, fibrinous mass; kidneys weighed six ounces, contained fibrinous masses, surrounded by a congested zone. The secreting structure generally contained much granular epithelium.

*Cases of Burn, see Nos. 121 and 122.*



SERIES XVIII.—*Connection of secondary deposits of pyæmia and new growths.*

This may appear somewhat foreign to the subject proposed when treating of pyæmia, but we cannot refrain from alluding to it. Between cancer and pyæmia there would seem to be an insuperable gulf, the one being a disease owing to some deep-seated cachexia or vice in the system, perhaps transmitted for generations, while the other is an affection to which every one of us in the best of health is liable, originating in the slightest injury. Notwithstanding this difference, we have more than once met with cases where opinions varied as to the greater propriety of placing the disease under the head of pyæmia or that of new growths. Such cases have made us consider in what respects these two apparently opposed affections differ, and in doing so we discover more resemblances than we might at first sight suppose. There is, of course, a great difference between an organized and unorganized deposit, but it is not in every case of new growth that the distinction is very clear, unless blood-vessels are manifest; but apart from this, an inflammatory product and a new growth are not so distinct; indeed, in some cases might be called identical. Let, for example, the deposit consist mainly of simple nuclei, a question may arise as to its character, particularly if it be known that before the whole body was affected by deposits of this nature a local affection for some time existed. In such cases it has generally been assumed that if the tumour was firm it was a new growth, and probably of a cancerous description; if resembling pus, it was pyæmia, and had altogether a local and accidental origin. Now, we have already stated our conviction that the system may be contaminated by seeds propagated from a local source, and that, as like produces like, of whatever nature the original morbid material is, of the same kind are the secondary deposits.

We have already, on more than one occasion in this journal, endeavoured to show the local character of many so-called malignant growths from the same fact, and here we have already stated that, as pus produces pyæmia, and fibrin induces fibrinous deposition, so we think that an inflammatory product,



which has no tendency to progress to the stage of pus, may induce secondary deposits of the same kind in other parts of the body. If such a fact be considered in connection with pyæmia, the statement may present nothing remarkable, it simply implying that, instead of purulent elements being propagated, a less advanced stage of inflammatory product may be similarly diffused through the body. If, on the other hand, we admit that many new growths, as they are styled, are non-vascular, and consist of little else than some cell- or fibre-tissue, then we may compare such a case as we have alluded to with new growths, and by so doing we consider that we sap the foundation of much of the current opinion on this subject ; for, as before said, if there be a prevailing belief that new growths, when involving several parts, denote a malignant condition of system, and that their removal is useless upon such a theory, and now, if it be said that morbid deposits, not distinguishable from these, have an undoubted local origin, as they do when arising from injury, it will be seen how two subjects are affiliated which have been regarded not only as distinct, but as opposed. If we make use of the microscope to aid us to distinguish between two such apparently opposite affections, we discover the difference (unless the tumour be vascular) to be little more than a trifling variation in the shape of a cell, or, perhaps, the difference between an oval nucleus and a round one. The subject is too large a one to enter on more fully, but we have considered it necessary, in treating of pyæmia, to record one or two cases of other diseases with which it is closely associated.

The first one is very remarkable, resembling, as it does, in many respects, the cases where fibrinous deposits occur in the viscera, and at the same time resembling cancer from the fact of the external parts of the body being associated in the disease.

#### CASE 168.—*Fibrinous tumours in skin and viscera.*

Susan G—, æt. 45, was admitted into the hospital on March 13th. She was then extremely ill, was thin, and had a marked sallow hue. She said she had been ill only three weeks, but could scarcely declare what ailed her. A lump was found on her head, which she attributed to a blow received just before her illness ; this, on being handled, burst and gave forth blood and fibrin. There were then observed on the surface of the body several other lumps, of a dark colour, which appeared like blood



under the skin; and the gums also at the same time bleeding, the case was first regarded as one of scurvy. Subsequently, however, as these tumours increased in size and number, and some appeared firm, it was regarded rather as melanosis. The patient afterwards had cerebral symptoms, and sank into a comatose state.

*Post-mortem examination.*—Body very wasted, and of a yellowish colour. The lump on the head appeared to have contained some fibrin as well as blood. On the surface of the body there were a number of small tumours, the largest being about the size of a marble; these, when incised, were found to be quite circumscribed, of a dark-red colour, and composed apparently of fibrin; in some there was liquid blood; the brain contained a mass of the same description, and about the size of a walnut, firm and circumscribed; it had some liquid blood around it. The lungs contained, each from twenty to thirty masses of the same kind; some projected on the surface, and had at first sight much the appearance of ordinary phlebitic pneumonic deposits, and such they were taken to be; when cut through, however, they resembled rather masses of apoplexy or fibrin than ordinary inflammatory products; they were circumscribed, firm, and dark red; at the lower lobe of the left lung there was a solid mass, the size of the closed fist; no lymph on the surface. The liver contained similar deposits; two of them very large, of a red colour, and resembled masses of fibrin, some soft and breaking up; the spleen contained a very large, red, fibrinous mass, and some smaller ones; these resembled rather the early condition of the changes seen in pyæmia than the wedge-shaped plugs of the usual cardiac production; kidneys healthy. The microscope showed in all these deposits a fibrillated tissue, very like the fibrin of the blood, and amongst this numerous small nuclei.

We are unable to place such a case as this in the received category of morbid processes, but looking upon it simply as it stands, it appears as if an injury to the head, followed by fibrinous effusion, had been instrumental in propagating similar conditions elsewhere; that just as purulent effusions give rise to similar states elsewhere, so here an earlier or different kind of product had started into existence its own peculiar material. In the next case but one a similar theory may be propounded.

In the following case, although different from the preceding, the elements of the morbid products were of that simple kind that it was difficult to decide whether it was more correct to place the case in the category of new growths or pyæmia.

#### CASE 169.—*Doubtful deposit in organs.*

Jemima W—, æt. 49. Admitted with disease of the brain and paralysis; she was scarcely conscious, and thus could give no account of herself.

*Post-mortem examination.*—A mass of disease, as of tumour, was seen projecting on the left hemisphere; this, being cut through, was as large as a small egg; it was yellow and soft, resembling an inflammatory product breaking up; it was thus a question



whether it was a new growth of the cancerous kind or an inflammatory product allied to those of pyæmia. The brain contained also two or three smaller growths or deposits of the same description. The lower lobe of the right lung was consolidated into a soft, yellow mass, much resembling the appearance in the brain; there were no deposits in the lungs in the ordinary manner of cancer. A small tumour at edge of liver resembling cancer; lumbar and mesenteric glands enlarged; several tumours in the kidneys. The diseased structure showed nucleated cells by the microscope, and that in liver and kidney was vascular on the surface; the tumours were consequently thought to be cancerous; their naked-eye appearance and manner of diffusion resembled more the ordinary inflammatory material.

The next case, we think, shows pretty clearly that there are forms of disease usually styled pyæmia which are not strictly such, the source of the infection as well as the secondary results never having arrived at the stage of pus. The case may be looked upon as exemplifying the first grade from a pyæmia to a new growth.

#### CASE 170.

John C—, æt. 34, was sent to the hospital as one of typhus fever. When admitted he was extremely ill, but appeared to be suffering from irritative fever rather than typhus; his right leg was much swollen, presenting the appearance of a limb affected with phlegmesia dolens; no pus was discovered in it on examination. He remained in this state, his symptoms certainly resembling those of typhus as much as pyæmia, as he lay in a perfectly helpless and drowsy state. He had no rigors. At the end of three weeks he died.

*Post-mortem examination.*—No suppuration in limb, which had now become much reduced in size; lobular pneumonia existed, but not advanced to suppuration, the hepatized portions being firm; the spleen contained firm, diffused masses, and the liver, also, a few similar small deposits; none of these were soft and purulent, but all firm and fibrous.

The next case is still different from the two former, and belongs to a class of disease occasionally met with; it is further removed from the subject under discussion than the other cases, but we give this one example, thinking that a too comprehensive view cannot be taken of these pathological subjects.

#### CASE 171.—*Cell diffusion in organs.*

Emily H—, æt. 10. Admitted into the hospital with enlargement of the liver, spleen, lymphatic and salivary glands. She became anasarcaous and died.

*Post-mortem examination* showed the salivary glands to be much enlarged and converted into hard tumours; when cut through they presented a glistening, smooth surface, uniform and very hard; the thymus gland was similarly affected, and



extended downwards for some distance into the chest; also some lymphatic glands showed the same appearance. Liver much enlarged, being twice the usual size, and reaching to the left side; it was opaque and white, and thus resembled a fatty rather than a lardaceous liver, but was very heavy instead of being light; it was not fatty, but affected in a similar manner to the other organs. The spleen also enlarged to twice its natural size; the kidneys of immense size, and of a milk-white colour; they presented a homogeneous surface, in which no structure could be seen. The walls of the uterus were increased in thickness, as if affected like other parts. The microscope being applied to these affected organs, the enlargement appeared due to the infiltration of them by small cells or nuclei, somewhat resembling pus-cells.

#### SERIES XIX.—*Pyæmia cured.*

We have already stated that pyæmia, as affecting the exterior of the body, is often recovered from, as in the example given below. The question of interest, however, is as regards the internal organs; whether, when affected by the ordinary pyæmic inflammatory processes, they may recover their normal state. We consider that the answer cannot be rigidly answered, either positively or negatively, but that the result depends upon many causes in operation. We have already said that patients may rapidly recover from the first shock of the process whereby the blood became infected, and, on the other hand, we believe that the majority of patients who die from pyæmia succumb to the state of blood circulating through them rather than to the implication of any organ which may accidentally be affected. If this be so, it is clear that there are degrees of blood poisoning, and that there are certain amounts of this from which recovery may take place, as well as a degree which tends to a fatal termination. Death may, however, sometimes result immediately from the local disease, as in the lungs, after the morbid condition of blood has been recovered from, and the question now before us is—should the patient rally from the first symptoms and his blood be purified, what degree of visceral disease may also be recovered from? We do not see why an early lobular pneumonia should not cease in the first stage, and resolution occur as in ordinary pneumonia, if at the same time the blood be renovated; but our experience informs us that this is probably rare, judging from cases where we suppose the organs have become affected, and where a fatal result generally ensues. We have been led to ask ourselves the question as to recovery of organs after



pyæmic processes from the discovery of marks of disease in patients who have had symptoms of blood poisoning, and we refer especially to the lungs. We have frequently met with masses of chronic pneumonia in patients who have suffered, in all probability, from purulent infection of the blood. This discovery may seem to be a most feeble basis for such a supposition, and we confess that it is so ; nevertheless, the question is ever afresh coming before us, especially when the small masses of disease in the lung are spread through the organ after the manner of secondary deposits. Those well acquainted with the morbid condition of organs are well aware how frequent are indurated inflammatory masses to be met with in the lung ; these, however, are only few in number, and especially involve the upper lobe ; it is also well known how secondary deposits, whether inflammatory or new growths, are diffused through all parts of the lung, the lower as well as the upper. Now, it is from the occasional discovery of small masses of indurated tissue scattered throughout the organ in this manner that the suggestion arises as to these being due to a morbid condition of the blood, and much more is the idea enforced if the patient be known to have previously suffered from symptoms of a pyæmic character. If it be so, we would not suppose that these deposits are the actual remains of acute inflammatory products, since we maintain a very strong disbelief in acute processes ever becoming chronic, but rather that the latter are essentially different ; we should hold that the chronic indurations had been slow in their formation, and had been merely started into growth by the pyæmic process, the latter being very limited and very slight, but, whenever occurring, the affected lobules constituting so many foci of a more prolonged inflammatory action. Such a case is the one below, No 173, and in some others already given, as Case 47, &c., the same supposition of the recovery from the acute attack was held.

CASE 172.—*Puerperal pyæmia ; cured.*

Mary S—, æt. 20. A few days after her confinement had all the symptoms of puerperal fever, and was so ill that her life was despaired of. She, however, continued alive for a fortnight, when she came under Dr. Wilks's care. She was then desperately ill, perfectly blanched ; pulse 140 ; abdomen tympanitic, and watery motions involuntarily discharged ; her eyes fixed, and pupils dilated, so that every hour was looked upon as her last. During the following week she lay in the same



half-alive state, and at the same time her left wrist became swollen, as well as ankle, and an abscess was forming near the hip. After this she slowly improved; the abscesses on the body were opened, but no external suppuration appeared over the joints, but evidently disorganization was proceeding within. At the end of a month the left knee and right shoulder became swollen and painful. There were now four joints affected; the two first mentioned were quite stiff. She subsequently had acute pain in chest, with hurried respiration, and afterwards some slight expectoration, which suggested a local pneumonia. This, however, was never positively ascertained. Other abscesses afterwards came on the body, which were opened. It was not until the expiration of five months that she was able to leave her bed; the left wrist and ankle appearing quite ankylosed.

### CASE 173.—*Chronic pyæmia; pneumonia (?)*.

Robert B—, æt. 58. Admitted into the hospital in June with stricture, perineal abscess, &c. He was excessively ill, with all the symptoms of pneumonia, and it was thought that he would then have died. It was not actually proved that he had pneumonia by stethoscopic signs, but there was little doubt that his lungs were affected. He rallied from these violent constitutional symptoms, but his urinary complaints remained, for which he kept his bed until December 8th, when he died. The post-mortem examination showed extensive disease of the bladder and kidneys, and, besides this, each lung contained about thirty hard masses of indurated tissue, the result of chronic pneumonia. These were circumscribed, and not infiltrating the tissue in the ordinary irregular manner, and were scattered through all parts of the organs, after the manner of secondary growths or deposits. Some were softening in the centre.