LETTSOMIAN LECTURES

ON SOME POINTS IN THE SURGERY OF THE URINARY ORGANS.

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LECTURE III.—THE OPERATIVE TREATMENT OF STONE AND TUMOURS OF THE BLADDER IN RELATION TO SOME RECENT VIEWS AND PRACTICES.

THE surgery of the bladder during the last ten years will, under all circumstances, occupy a conspicuous position in the history of our art by the introduction of litholapaxy, the revival of the suprapubic or high operation under somewhat altered conditions, and by an approach to a more systematic method of treating tumours and growths connected with the interior of the viscus. It has been my privilege to watch the progress of these several procedures, not merely as a passive critic, but as an active participator with others in all the advantages these measures have proposed to confer. Within the period mentioned a vast amount of experience has already been obtained bearing upon these various proposals, and I think the time this evening cannot be better occupied than in drawing some conclusions in regard to them which seem to me may now be fairly and advantageously done; and, in referring to these several procedures, I will endeavour, in speaking of each, to indicate what appears to me to be their strong as well as their weak points, and to what extent our present experience tends to show they have justified the anticipations with which they were promulgated. In the course of these remarks I shall not trouble you with statistics relative to operative procedures, as I do not attach much importance to them. It seems to me that in drawing conclusions from figures of this kind, gathered from various sources, we are putting ourselves much in the same position as the individual who, to make sure about the weather, consults three different kinds of barometer, and is rewarded by finding them respectively indicating at the same time "stormy," "rain," and "very fine." From such variations as these most persons would be disposed to conclude, not that it was safe to go out without an umbrella, but that at least two of the instruments must in some respect be faulty. On the other hand, to the collective work of individuals carefully recorded, with all failures and successes, the greatest importance is to be attached, as indicating not only results, but how these were obtained.

In the first place I will take a brief survey of the position that the crushing operation seems to occupy at the present day. Since the procedure which is justly associated with the name of Dr. Bigelow, of Boston, was brought under notice, exactly ten years ago this month, it has been applied to almost every condition under which stone in the bladder is met with in males, females, and children. Without entering into the history of the modern crushing operation for stone, or referring to discussions as to what led up to the important changes it represents, I think most persons will be inclined to admit that the lithotripsy of to-day occupies a very different position compared with what it did ten years ago. At the latter there appeared to be a tendency to limit its application considerably, whereas now we have rather to fear its extension to conditions for which it could hardly have been intended. The removal of a stone at a single sitting, without leaving behind any cause either for its reproduction or for cystitis, represented such a desirable combination of objects as at once to place the matter before surgeons in a light which it had not previously done. Let me stop for a moment to inquire how far this has been realised. In the case of stones of a moderate size, occurring in adults in other respects healthy, I think it will be generally admitted that to these lithotripsy may now be applied with a degree of success which prior to this decade had never been obtained in the history of either the cutting or crushing operations. Nor can there be any doubt, excepting in children perhaps, that by far the larger number of stone cases requiring operation occur under these

circumstances. But this, unfortunately, does not represent the whole truth, as lithotripsy has and is being applied to a class of cases where the anticipations formed in reference to it in its most modern form have not been realised; and this brings me to notice what I would speak of as the weak side of this proceeding. In corroboration of this, let me read a passage from a recent address by Mr. Cadge (Hunterian Lectures, Royal College of Surgeons, 1886). "Although," he observes, "the immediate and direct mortality of lithotripsy is small, the recurrence of stone is lamentably frequent. In my own list of 133 cases there were 18 in which recurrence one or more times took place, being about 1 in 7. Sir Henry Thompson, with a much larger number of cases, gives about the same proportion. I am disposed to infer, however, that recurrence is more frequent than this, because it is not likely that all who get relapse apply to the same surgeon again. Patients may, and frequently do, apply to the same operator once or twice; but after a time they either apply to their own surgeon or they decline further treatment, and too often their subsequent history is one of painful endurance of chronic bladder disease and gradual exhaustion. If, moreover, there be added to the list those numerous cases of phosphatic deposit or concretions, so frequently noticed after lithotripsy, the relapses would, I believe, reach to nearly 20 per cent. This seems a heavy indictment to bring against lithotripsy, but I am afraid there is no gainsaying it; and, if so, it would be wrong to pass it over or to make light of it." Though, with a very much less experience of lithotripsy than that to which I have just referred, I became impressed some years ago with the conviction that in certain cases we could do something more than merely remove the stone from the bladder.

It will, I believe, be generally admitted that the state of the interior of the bladder relative to its shape, its power of contraction, and the presence or absence of inflammation has, without being precise, a determining influence in the production of stone. In the majority of instances this is merely a matter of experience deduced from observation, whilst in not a few this tendency is not discovered until, as it were, the experiment of removing the stone by crushing and aspiration has been tried and failed. And, in connection with this observation, I think we have been rather too much disposed, if I may judge from a good deal of literature relative to this subject, to allow the physical properties of the stone to determine for us, as it were, the selection of the operation, irrespective of the relative conditions to which I have referred. Though a large hard stone is, as a rule, best treated by lithotomy, this by no means implies that some small and soft ones are the less advantageously removed by a similar proceeding.

Let me take, for instance, the case of a stone in the bladder occurring in an adult, with some chronic cystitis and enlargement of the prostate. The probabilities are that for many months, if we look at the section of such a stone after its removal, the bladder has been engaged in encasing it in a mould of phosphates just as completely as if it were done by plaster-of-Paris. Now is it reasonable to suppose that you can suddenly stop this stone-forming process without leaving behind any contributing cause for its continuance. In connection with the subject more particularly of prostatic hypertrophy, I have examined a very large number of bladders, and, having regard to the distorted or pouched condition of the viscus, which so frequently accompanies this change, as well as the condition of the mucous membrane relative to the presence or absence of phosphatic deposit upon it, it has often struck me, not that lithotripsy has its failures, but that, under these circumstances, its successes are so numerous.

Reflections such as these induced me, some years ago, gradually to alter my mode of procedure in cases of this kind, where either it was clear that the stone was the effect rather than the cause of disease, or where this fact was demonstrated by the failure of lithotripsy. I could not help feeling that the bladder, under these circumstances, was not unlike in many respects, a chronic abscess with a stone in it, and that it was just as necessary to open and drain the one as the other. Let me briefly illustrate this by one of my earliest cases. It was that of a man of 60 years of age, who submitted to lithotripsy on three occasions in two years, when large masses of phosphatic stone were readily removed. In the intervals between the operation, he never was free from vesical irritation. He could not empty his bladder completely without a catheter, the urine was more or less ammoniacal, and, in spite of careful catheterism, he suffered much from urinary irritability. He had some degree of prostatic enlargement, and some pouching or sacculation. Two years after the first crushing, I performed lateral lithotomy for him, and removed more phosphatic calculus

of recent formation. I put a large drainage-tube into his bladder, and he was drained and washed for eight weeks, until he voided normal acid urine, when the tube was removed, and the wound allowed to heal, which it did in the course of a month. This patient has now been perfectly well for over three years. I would refer to this and similar instances, not as being merely examples of successful lithotomy, but of successful drainage.

Three years ago I brought this subject (*Annals of Surgery*, June, 1885) under the notice of the profession, and described at length my mode of operating and of draining; and to these points I would now briefly direct attention. So far as the method of operating is concerned, my object has been to remove the stone by such an incision as will permit the bladder to be readily and efficiently drained; hence the proceeding stands much in the same light as evacuating matter from a chronic abscess does to the important part of the treatment by drainage that is to follow.

In the performance of lithotomy in cases of this description, my aim is to make a wound into the bladder which is not likely to close up before the interior of the viscus is ready for the reception and continence of the urine. Hence I am an advocate for lateral lithotomy, which best fulfils the conditions that are required. But though the mode of opening the bladder is important, the process of draining, where the condition of the viscus or of the parts above it is such as to require this, is still more so. As a rule, cases of this kind require drainage to be continued from four to eight weeks. I have drained them as long as ten weeks before the state of the bladder, as evidenced by the urine, was such as to allow the wound to heal up. The drainage-tubes I employ for this purpose are larger than those which have been used temporarily by some surgeons after lithotomy, and some care is required in fitting them to each case. [Mr. Harrison showed some specimens of his drainage-tubes.] By their use, with the exception, perhaps, of the first few days after the operation, when some urine may escape by the side, I have been able to keep patients absolutely dry during the whole process of treatment, whilst, at the same time, antiseptic dressings have been applied to the perineum; but I do not attach much importance to the latter, so long as the urine drainage is perfect.

Let me illustrate this practice by another case of somewhat recent date. It was that of a gentleman, 70 years of age, who, for over four years had never passed one drop of urine except through a catheter, and who had for the last two years of this period absolutely lived with the instrument in his bladder, both day and night. I examined him in October last, and found that he had a stone in his bladder, but one that I could have quite easily removed by crushing and aspiration. However, in the presence of the symptoms mentioned, and guided by other experience of the kind to which I have referred, I elected to perform perineal lithotomy, and to drain. My colleague, Mr. Mitchell Banks, held the staff for me, and I removed three uric acid calculi of moderate size, coated with phosphates. I made, as I usually do, a very free opening into the neck of the bladder, and put in one of my largest-sized drainage-tubes, with two or three superficial sutures in the wound to keep it in position. He was drained continuously for eight weeks, when it was found, co-incidentally with a much improved state of the urine, that the latter was occasionally forced out spasmodically through the normal channel of the penis. The drainage-tube was then removed, and the wound allowed to heal. Though the function of the bladder had been in abeyance for four years, he has now complete control over his urine, and can expel it spontaneously without any assistance from the catheter, which he has entirely discarded since the operation. At present he has to pass his urine more frequently than is desirable, a circumstance which is probably due to the empty state the bladder has been in ever since he commenced to use the catheter continuously, day and night, two years ago. Notwithstanding this inconvenience which, I believe, will improve in time, it is remarkable that the bladder should have entirely recovered its power after such a long period of inaction as four years. Had I crushed, as I could have easily and safely done in this case, I feel sure that the power of the bladder would not have returned in the way that it has.

My friend, Mr. Cudge, in referring to recurrences after lithotomy, seems to think that in the matter of treatment we are placed somewhat on the horns of a dilemma, that is to say, if we crush there is a considerable probability of the stone recurring; whereas, if we cut, we adopt a harsh proceeding, and one more immediately perilous to life. As I have said before, I do not attach much importance to statistics, for putting aside what may

be due to the accidents of lithotomy, to which we are all more or less liable, and which are really responsible for no inconsiderable amount of the mortality following this operation, the results will be largely determined by the attending circumstances of the individual case. If a patient comes to be treated for a stone in his bladder with dilated ureters, and with only about one-fourth to one-tenth of his normal amount of kidney tissue, and the balance made up of pus cavities, I do not think it makes much matter what you do to relieve the suffering caused by the stone, as the result will be the same whether you cut or crush. Putting cases of this kind aside as being entirely outside the question, just as they are beyond repair, and taking instances where the only objection against lithotripsy is that the stones are likely to return or have been proved to do so, I have not observed that the perils of lithotomy are very great.

In analysing my experience of lithotomy, I can refer to fifteen cases where the process of opening the bladder was followed by a more or less prolonged system of drainage and irrigation, such as I have just described. Of this number, three terminated fatally in the course of from three to five weeks, by reason of the far advanced suppurative condition the kidneys were in. This was considered as probable at the time of operation, and was proved by *post-mortem* examination. I had no desire to operate at all in these instances, but the patients were in such a painful condition that I had no alternative but to do as they wished, and run my chance. However, as drainage was employed after the stones were removed, I must in fairness include them. In addition to observing the relief that was thus afforded to these persons, I would further remark how importantly they illustrate the disastrous consequences that may ensue, when stone and cystitis are complicated with obstruction, or anything that interferes with the process of natural urine drainage, prior to the removal of the stone. In two of these cases, there was some enlargement of the prostate, whilst the third was complicated with an old urethral stricture. Further, they clearly point to the importance of drainage as a necessary part of the process connected with the removal of some stones. The remaining twelve persons so treated recovered, and remain well, or did so up to the time that I had cognisance of them. I think I should be pretty sure to hear of them if they had any recurrence. Three of these cases had been previously treated by crushing, to one of which I have already referred more in detail. In determining how long it is necessary to continue the drainage, I attach considerable importance to two points—first, to the condition of the urine, and, secondly, to certain muscular actions of the bladder, which become more apparent in those cases where atony pre-existed. So long as a patient goes on discharging ammoniacal or very purulent urine, so long must the drainage be continued, as to close the bladder under these circumstances is certainly to favour the reproduction of those local causes which contributed to the formation or growth of the stone. When the urine is becoming normal, one of the earliest indications that the drainage-tube may be withdrawn is the voluntary, or, I should rather say, the spasmodic, expulsion of urine along the natural passage. After three or four weeks' drainage, according to circumstances, I have allowed patients to get up for a little, and sit in a chair, with a clip on the edge of a drainage-tube, directing them to remove it when they feel desirous of urinating. It is under these circumstances that urine is sometimes expelled independently of the tube along the natural passage. This I have found a sure indication that the power of the bladder will be restored in those instances where it had been lost to a greater or lesser degree. And it not only applies to cases where a stone is present as I have illustrated, but to others.

This was evidenced in a remarkable way in the following case, which much impressed me at the time, in reference to what opening and draining are capable of doing. It was that of a man aged 68, who was under my care in the Royal Infirmary in 1883, for an atonied bladder and retention of urine, where the regular use of the catheter had become, in the course of time, extremely difficult by reason of the obstruction. After three weeks' trial of various plans of treatment, I performed perineal cystostomy, divided the prostate, and put in a drainage-tube. This was worn for eight weeks, when it was noticed that a certain quantity of urine forced its way along the urethra. The tube was then withdrawn, and the wound gradually closed. After this the patient never had any further difficulty in urinating, though the power of the bladder had been entirely suspended for some months prior to the operation and drainage. Six months subsequently he was seized with hemiplegia, which confined him to bed for the rest of his life, but

I ascertained from his medical attendant, that it had never been found necessary again to make use of the catheter. Other cases of the kind might be adduced in support of the practice I am now advocating.

In two instances where the stones were very large I had to divide both sides of the prostate. I could not help observing that these cases made very rapid progress. It is of much importance that the wound should invariably be made clean and straight, and that the relations of the parts be not unnecessarily disturbed with the finger, as thus pouches are made in which urine may lodge. I should also mention that in one case the progress towards recovery was somewhat retarded by two or three attacks of secondary hæmorrhage, necessitating the use of a plug outside the drainage-tube. However, it was not sufficient to be of much importance. In another instance the patient had two or three slight attacks of orchitis, which was probably due to some imperfection in the drainage apparatus; where the prostate is very irregular this may happen, unless care is taken in making the incision into the neck of the bladder.

In these remarks I have thus endeavoured to illustrate what appears to me to be the weak aspect of lithotripsy, and what alternative seems to me, from some practical experience specially directed towards this point, best adapted to meet the difficulty. Fortunately, I believe these cases are not now so frequent as they used to be, owing, no doubt, in a great measure, to the better means we possess of detecting stone in the earlier periods of its formation, when it can be dealt with by crushing with the most complete success. To eliminate the cases which are not adapted for crushing is worthy, I am sure, of our most careful attention, and as a contribution towards this I must ask you to accept these remarks.

Turning to another debatable point, I would refer to the application of lithotripsy to male children. Some valuable records relating to this operation have been furnished by surgeons practising in India, amongst whom I may mention Dr. Freyer and Dr. Keegan. The latter gentleman has more particularly demonstrated the great success that may be obtained in boys by the crushing operation, and his testimony has been to a considerable extent corroborated by Mr. Walsham and other surgeons. Having regard to the great success of lithotomy in male children, I should not feel disposed to extend the crushing operation in this direction materially, except in the case of very small stones. It has, I know, been alleged that lithotomy means emasculation, but I am not aware that sufficient proof of this has been afforded. If this were proved to be an occasional and unavoidable consequence, the reasons for crushing in boys would be materially strengthened.

The suprapubic operation for stone owes its recent revival in a large measure to the observations of Garson, the practice of Petersen, of Kiel, and the advocacy of Sir Henry Thompson. The fact that the bladder is usually uncovered by peritoneum immediately above the pubes has for a long period been rendered available by surgeons for tapping with impunity in cases of retention of urine. To increase this area, and to permit the bladder to be opened and stones removed without injuring or wounding the cavity of the peritoneum is the chief feature in Petersen's method of performing the high operation. Since the introduction of this method of operating considerable discussion has been excited in reference to the circumstances under which it is applicable, and much variety of opinion has been expressed. If, however, we merely content ourselves with taking the experiences of surgeons where this measure has been practically tested, we shall have no difficulty in determining its value.

In the first place I do not think that anyone would attempt the removal of a very large stone from the bladder by any other proceeding. We have already had several examples where large masses have in this way been successfully removed, which, judging from previous experiences of the kind, could not have been safely accomplished, even if it had been possible to effect their removal at all. And this applies equally to some cases of distorted pelvis, where the outlet is so contracted as to render perineal lithotomy impossible. I should have been very glad to have availed myself of this method of operating in one of my earliest stone cases some twenty years ago, where I performed lateral lithotomy for a boy with his hip ankylosed in an extended position.

In the second place, experience has already shown us that the suprapubic operation is well adapted for the removal of certain foreign bodies from the bladder more or less coated with phosphates, where it is necessary that we should be able to see as well as to feel, and direct what we are desirous of doing. Perhaps one

of the best illustrations of this practice will be found in a case recently recorded by Dr. Gillon (*JOURNAL*, July 30th, 1887), where a penholder, over five inches in length, encrusted with phosphates, was removed from the bladder of a man through a suprapubic incision. Not only was the foreign body extracted in this way, but the operator was enabled to satisfy himself that no perforation of the bladder into the peritoneal cavity had occurred.

Thirdly, the suprapubic incision may prove serviceable in some cases of stone in the bladder complicated with a protruding prostate, where the removal of some portion of the latter may be further contemplated.

In the fourth place, the high operation will prove to many practitioners an easier and, therefore, a safer access to the bladder than the lateral perineal route, and thus, for this reason, and in the best interests of their patients, many will avail themselves of it under almost all circumstances. Are not these sufficient reasons for finding a place in surgery for this method, irrespective of the value that most of us, I believe, still attach to perineal lithotomy? I have no belief in the decline of perineal lithotomy, as it seems to me to possess advantages as a ready means of entrance to, as well as exit from, the bladder which no other method possesses.

In the controversy that has been recently raging in reference to the relative advantages of suprapubic and perineal lithotomy, I cannot help thinking that much of the difficulty which some have associated with lateral lithotomy, or Cheselden's operation, is, in a measure, due to a wrong conception of the way this operation should be performed. The point where it seems to me some surgeons are at variance with the description laid down by authorities on this subject is in reference to the employment of dilatation with the finger as a means of entering the bladder. I contend that such a process, whether there are grounds for its adoption, so far as the literature of the subject is concerned, or not, is not only unnecessary, but dangerous. It is unnecessary, because the opening into the bladder can be safely made with the knife, sufficient to permit of the finger being put, and not pushed, into the viscus; it is dangerous, because the risk is not inconsiderable of wrecking the operation by rupturing the urethra, especially in young children, and by destroying with the finger the natural relations of the parts. It is a misconception of this kind which alone imports an element of danger, so far as the mechanism of perineal lithotomy is concerned. Of the advantage that the latter operation affords as a means of draining the bladder I need not again speak.

But though, as I have incidentally hinted, suprapubic cystotomy will probably commend itself to some practitioners by the comparative facility with which it can be accomplished, we must not be unmindful that experience has already shown us that it, like other procedures having the same object, has its own difficulties and dangers. Instances have been recorded where a weakened bladder, under the pressure of distension, has given way, and death has then followed; and similarly the rectum has suffered in a corresponding manner, but without producing any serious consequences. To most of us the simplicity and ease with which lateral lithotomy can usually be performed is such as strongly to prejudice us in its favour, in the absence of any special reason to the contrary, as I have indicated. Still, on the other hand, as I have already said, there are places for both the high and the low operations in the practice of surgery, which they can fill with relative advantage, and without fear of clashing.

In the last place, let me say a few words in reference to the treatment of tumours and growths connected with the interior of the bladder. And I would take this opportunity of acknowledging the important services Sir Henry Thompson has rendered, in both adding to and applying our knowledge in reference to this subject. In surveying the literature relating to the operative treatment of tumours of the bladder, and comparing it with some little experience of my own in cases of this kind, it seems to indicate the great caution that is necessary in the selection of cases suitable for operation.

Malignant growths connected with the interior of the bladder are, I believe, just as much beyond the reach of surgery as those which are occasionally seen involving the cavity of the nose; I have, in a few instances, opened the perineum and explored them with the finger, but, beyond giving vent to offensive urine, mixed with blood, and the *débris* from the growth, I cannot say that I have seen any permanent good follow, and I am disposed to think with others they had best be let alone. If exploration with the

finger from the perineum indicates, by reason of the limited connections of the growth, the expediency of attempting its complete removal, or if the mass is considerable, the suprapubic incision may with advantage be proceeded with. The value of the perineal incision for drainage has already been demonstrated in several instances of this kind. Still, on the whole, the less intravesical malignant growths are interfered with the better, so far as concerns both the comfort and life of the patient. Of the curable forms of intravesical tumour of the bladder, the simple papilloma or villous growth furnishes us with an example, and this has undoubtedly within the present decade been brought within the reach of surgery. In the cases of this kind where I have operated, I have been able to accomplish all that I desired by a perineal incision. The following instances illustrate some of the difficulties connected with the diagnosis and treatment of tumours of the bladder. The first was that of a young man I saw in 1883, who was suffering from hæmaturia. I opened his bladder from the perineum, and removed a villous growth, which seemed to occupy the orifice of the left ureter; he was temporarily relieved, but in the course of a month he died of exhaustion in consequence of repeated attacks of hæmaturia. After death, the left ureter was found dilated; the pelvis of the left kidney was also dilated, and contained a villous growth resembling that which I had removed from the bladder.

The other case was that of a middle-aged man, who presented all the symptoms of calculous pyelitis of the left kidney. The pain was so severe that I determined to open and explore the kidney, which I did in the early part of December, 1887. I found the kidney not much larger than natural, but it was simply a bag of pus. I could find no stone or other cause for the renal obstruction. The bladder was examined, but nothing abnormal was detected. The patient had a good deal of hæmaturia after the operation. He got gradually weaker, and died about four weeks after the operation. At a *post-mortem* examination, a small epithelioma of the bladder was found, which had completely occluded the left ureter, and had thus led to the disorganisation of the corresponding kidney. Such are illustrations of some of the difficulties which attend the diagnosis of tumours connected with the interior of the bladder; they certainly seem to indicate the great caution that is necessary in coming to a conclusion that their extirpation should be attempted.

I have now completed the task which you, in your kindness, have imposed upon me. It only remains for me to thank you for the patient and attentive hearing you have given me.

A CASE OF CIRRHOSIS OF THE LIVER, WITH CHRONIC CEREBRAL SYMPTOMS DEPENDING UPON THE CIRCULATION IN THE BLOOD OF DIGESTIVE IMPURITIES.¹

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I HAVE ventured to invite the attention of the members interested in the Medicine Section for a few moments to a case which I confess puzzled me not a little when attempting to interpret its clinical features. In addition to throwing some light upon certain nervous phenomena that have given rise to difference of opinion from time to time—I refer to some of the nervous symptoms of acute yellow atrophy of the liver, so-called bilious attacks, and allied conditions—it exemplifies the manner in which an organic lesion of one portion of the economy may be responsible for symptoms referable to another that practically mask and overshadow those of the primary lesion; just as in winter the scion mistletoe may usurp the importance of the apple by concealing with its evergreen leaves the naked branches of the stock. I regret that the early history of the case I am about to relate is not as accurate as I could wish, owing to the fact that the patient's memory was considerably impaired, and in consequence we were dependent upon his wife, who lived at a distance, for the major portion of the details. It is also a matter of regret that some of the points were not more exhaustively worked up; but we are all wise after the event, and I suspect a *post-mortem* examination suggests to the minds of a good many of us errors of

omission which good resolutions prompt us to avoid in the future.

J. W., aged 39, a sailor, an American by birth, was admitted into the Newcastle-on-Tyne Infirmary on September 9th, 1886. His previous history, as far as it could be ascertained, was as follows. For eighteen years he had sailed from English ports, and during that time he was much exposed to malarial influences, chiefly in New Orleans. There was no history of syphilis or of alcoholic excesses. Nine years previously he had suffered from a severe attack of intermittent fever, and some time later was admitted into Guy's Hospital for jaundice. On recovering he returned to sea, and remained in good health until the beginning of 1886, when he began to complain of weakness, loss of appetite, etc. He continued to perform his duty, though with difficulty, until February 2nd, when he was obliged to leave the ship on account of illness. On his return home his wife remarked that his skin was sallow, that he looked ill, and that his mental condition was altered. He was fitful, for example, and was inclined to wander about the streets in an aimless way, which he did for two or three days, when an attack of excitement with delirium occurred, and it was with difficulty his friends could restrain him in bed; indeed he occasionally eluded their vigilance, and rushed into the streets in his nightshirt. For some weeks this condition continued, though the excitement became more controllable, and his mental state gradually improved.

On March 30th (1886) he was admitted into the Middlesbrough Infirmary, having presented himself in the first instance as an out-patient for right inguinal hernia, when an enlargement of the spleen was detected. During his stay in the Middlesbrough Infirmary, which was for upwards of four months, his speech and sight were noticed to be impaired, and his mental condition peculiar; his memory was defective, and he was as a rule markedly apathetic, though occasionally emotional. The tendon jerk was increased in both arms and legs.

Whilst under treatment in hospital his general health improved, but his nervous symptoms remained unaltered. He then returned home for some weeks, when his wife found it very difficult to manage him. He took a dislike to his children, and made free use of the most foul language, a practice that was foreign to him. He would lie for hours at a time taking no notice of the surroundings, and then break out into a state of wild excitement. He now rapidly became weaker, and at the same time more unmanageable, so that his wife was glad to transfer him to the Newcastle Infirmary.

On admission he was observed to be a dark-complexioned man, fairly well nourished, with a peculiar earthy sallow pallor of the skin, and looked older than his age. His speech was slow, drawling, and deliberate, and strongly suggested the speech of a general paralytic. His memory was decidedly weakened, though at times he appeared to have accurate glimpses of his past life. He was highly emotional, laughing or crying easily. The sclerotics were tinged yellow. The tongue was clean and was protruded tremulously; there was, however, no tremor of the lips. The arms shook on muscular exertion, as, for example, when he lifted a cup to his mouth. A similar tremor affected the head on sitting or standing. The gait was unsteady, swaying, and tremulous. The tendon-jerk phenomenon was decidedly increased in both upper and lower extremities. The plantar reflex was absent. The limbs were much stronger on the right side than the left; in fact, there seemed to be a slight degree of left-sided hemiplegia. There was no anaesthesia, but, on the contrary, a certain degree of general hyperaesthesia was remarked. The spleen was considerably enlarged, rounded, and firm, and reached to the level of the umbilicus and to within an inch of the middle line. The liver dulness was diminished. The urine was passed in considerable quantities, the daily amount being rather above the average, varying from 50 to 80 ounces in the twenty-four hours. It was the colour of Madeira, bright and clear, and contained more than a trace of bile, but no albumen or sugar.² Several specimens were sent to Dr. Bedson, the Professor of Chemistry in the College of Physical Science, who was asked to examine it for iron, and he kindly furnished me with the following report:

"Several determinations of the iron in the first sample of urine received in December, 1886, were made, and the most reliable give 38 milligrammes of iron per litre. I had some trouble with this sample, some of the iron determinations appearing excessively high. The second sample was examined two weeks later, and

¹ Read in the Section of Medicine at the Annual Meeting of the British Medical Association, held at Dublin, August, 1887.

² The test for sugar was only made once by the clinical assistant, and his observation was not verified.