Practical observations on the operations for strangulated hernia / by J.H. James.

ON THE

OPERATIONS

FOR

STRANGULATED HERNIA.

PRACTICAL OBSERVATIONS

ON THE

OPERATIONS

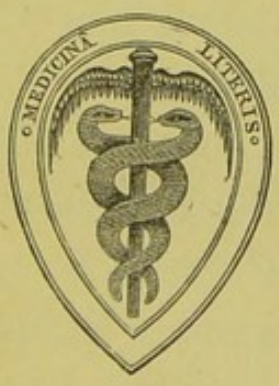
FOR

STRANGULATED HERNIA.

BY

J. H. JAMES, F.R.C.S.,

CONSULTING SURGEON TO, AND LATE SENIOR SURGEON OF, THE DEVON AND EXETER HOSPITAL;
CONSULTING SURGEON TO THE EXETER DISPENSARY.



LONDON:
JOHN CHURCHILL, NEW BURLINGTON STREET.
MDCCCLIX.

LONDON:
PRINTED BY J. E. ADLARD,
BARTHOLOMEW CLOSE.

PRELIMINARY REMARKS.

It has been my fortune to have been the surgeon of a large provincial hospital for a long period. From the commencement of my charge it has been my custom to record the most interesting cases which have occurred, and of course the operations, more especially those performed by myself. The result is a great accumulation of facts, and perhaps of some useful observations; if so, no apology would be necessary for offering such results to the public. Under a similar conviction I have already submitted a considerable number of cases, and remarks, 'On the Causes of Mortality after Amputation,' which appear to have obtained favorable notice. Another, hardly less important series, is that of Hernia. So much has been written on this subject, that it might be supposed to be exhausted. The number and weight of names to be found in the history of hernia perhaps exceed those in any other branch of surgery, yet there never was a

Preliminary remarks.

time when more numerous or more important contributions to its pathology have been offered, than in quite recent years. New facts; new proposals. The profession was never more keenly alive to its importance. A memoir on hernia, even at this late hour, if sufficiently practical, may not be out of place.

The opportunities I have enjoyed, considerable as they have been, are not to be compared with those which the great metropolitan hospitals afford; but when I see that one of the most valuable contributions on this subject was from the pen of a surgeon whose experience, at the time he wrote, was not much greater than my own,* I should not be deterred from the attempt simply from this consideration. Whether the remarks I have to offer, founded on what I have myself seen and done, and on facts collated from other sources, sufficiently warrant the publication, must be left to the judgment of others. The character of this memoir must not be misunderstood. It does not pretend to be a treatise on hernia; such an attempt would be much out of place when there are so many and so good; the object is, as briefly as possible, to give the result of my own experience, either as confirmatory of some, or as opposed to other, points of practice, which may now be more or less in esteem, giving reasons for my opinions when they differ from those of others, and offering, in some instances, views which I believe to be new, though it is indeed difficult to say what is really so.

As these observations are founded on my own practical

* "I have now, at the time of writing this, performed the operation forty times." (Hey, p. 130, 2d edit.; thirty-five, when he first published.)

opportunities, it is right they should be particularly stated. They have been partly derived from my own cases, partly from assisting others either in public or in private. I have, altogether, tolerably copious notes of about one hundred operations; these, however, constitute only a portion of those at which I have assisted, but of which I have either no records, or they are very brief. For obvious reasons I confine myself to the narration of my own; these amount to thirty-six, besides one very remarkable case of supposed umbilical hernia, which will be subjoined.

I have given *all* these cases, as I entirely assent to Mr. Luke's opinion, "that cases collected in publications from the separate experience of many surgeons seem wholly insufficient, and are almost worthless unless they embrace the *entire* of such experience;"* and I have omitted no material fact, however unsatisfactory to myself it may be. If any case were suppressed, or any important circumstance withheld, the value of the whole would be greatly impaired, and the force of any observations materially weakened. To deal fairly with the public, the "adversaria omnia" should be fully given. The great fault of our principal works on operative surgery is, that they give just information as to standard methods and ordinary contingences, but, with not very many exceptions, do not sufficiently point out the difficulties, and the means of avoiding them; like charts which give the course of navigation, but not the rocks, the shoals, and the quicksands. I do not apply this to

* 'Med.-Chir. Trans.,' vol. xxxi, p. 97.

hernia in particular; perhaps it less deserves the remark than many other operations.

Cases may be taken, and cases may be given in various forms. I should say that, in *noting* them, a free but faithful record is better than a cramped register, which imposes fetters inimical to freedom of thought; but as regards *giving* them, a different course may often be pursued with advantage. Cases may be *selected* for a particular purpose. It is often right to do so. These should be related in continuation, and in such a manner as to convey the especial information required, without encumbering the narrative with unnecessary detail; and of such we have many admirable examples. If, however, we propose to give the whole information we possess regarding a particular disease, the tabulated form is, I conceive, the best: at all events it tests the accuracy of the record. It appeared to me, that if my notes were not sufficient to supply the information which such tables require, I might well doubt the propriety of founding any argument upon them, and I therefore submitted them to the test of such arrangement as will be found in Mr. South's very able commentary on Chelius.* As these cases of mine were taken with no view of publishing them, still less with any arrangement in the nature of a register, it cannot be expected that they should fulfil in every instance the conditions which such a register demands. Yet, with one exception, they meet the object better than might have been

* Vol. ii, p. 50. Another important table, by Mr. Gay, has come to my hands since this was written, containing twenty-two cases. ('Medical Times and Gazette,' Aug. 14, 1858.)

expected—that exception regards the wearing a truss—an omission I regret, for more importance really attaches to it than at first sight might be supposed. I have, however, omitted to record it in so many instances, that I thought it better to construct my tables (in other respects the same as Mr. South's) without this column.

The tabulated form does not exclude the full development of a case. Under the head Remarks, will be found a brief statement of those additional circumstances which the course of the symptoms, or the examination, if death took place, may have supplied.

I have arranged these cases in three tables: the first giving all the recoveries; the second, the fatal cases in private practice; the third, those which occurred in the hospital. The convenience of giving the recoveries and deaths apart from each other is obvious, with reference to any inquiry; the object of separating the fatal cases in private and in hospital, will be stated in its place.

The practice pursued at this hospital, with little exception hitherto, has been to open the sac; consequently, from my own experience, I could venture no opinion on the comparative merits of the two operations. Nevertheless, there is no point which so much demands inquiry. The question naturally presents itself to every mind, why a method recommended by so great a surgeon as Petit, and supported by the opinion and practice of other eminent surgeons of his day, should have fallen into disuse, unless there were some cogent reason for it, founded on its ill success. We have seen it revived, with some modifications, by men of undoubted skill. We find that the results appear to have been attended

with great success, but still it becomes a most important matter to inquire whether the principles on which it is supported are altogether so just as at present supposed; *whether the analogy with the taxis is true; and whether the comparative success of the two methods, if fairly estimated, is so different as has been represented.*

If, as stated, I have little experience of the operation without opening the sac, it may naturally be demanded, on what facts I ground my arguments; now it so happens, that I can refer to a most valuable series of statements, which give indifferently the results as connected with either method, which appear to have been collected without bias; and to give the issue, with sufficient circumstances to warrant conclusions. They embrace the practice of the principal metropolitan hospitals for three years, and of the most eminent advocates of both methods, as well as of those who are free from any partiality. I allude to the statistics lately published in the 'Medical Times and Gazette.' *

With respect to these, I have in the first place separated the cases operated on in the usual method, and have analysed those which proved fatal; and when they appear to have been unavoidably so, have given the reasons for supposing them so, thus exonerating the *mode* of operating in those numerous instances in which such reasons can be fairly urged. In the second place,

* Those of several provincial hospitals have since been published, which, as far as I can judge, do not oppose the former; but I doubt much, whether Petit's operation has, as yet, been extensively adopted in the provinces; at all events the former series is quite large enough to answer my purpose.

I have given the deaths which occurred after Petit's operation, and the reasons for supposing that the most strenuous advocates of it have scarcely taken a complete and unbiassed view of the principles on which the success of either method may depend—a bold undertaking, doubtless, when such and so great are the advocates for that method; but as it is an undoubted duty of the profession to settle, if possible, not so much which is the best method in all cases, but which is the preferable one in particular cases, I believe that any endeavour, however imperfect, to advance this knowledge, will meet with a favorable acceptance.

To proceed:

Statement of my own cases.

Of the 36 cases operated on by me, 22 were femoral, 14 inguinal and scrotal; 24 were in hospital, 12 in private practice—of the latter 6 died, of the former 8. The proportion in private practice appears large, but, as regards these, extrinsic causes powerfully influenced the results, as will appear hereafter; and as to the total mortality, a comparison with the statistics given from authentic sources will show that it is far from being excessive. Mr. Erichsen says, that of 545 cases recorded in the journals, 260 are reported to have died.*

Proportion of deaths.

Of 266 cases recorded consecutively in the 'Medical Times and Gazette,' hereafter more particularly stated, where the sac was opened, 125 died. These were hospital cases, and if the proportion of my own hospital

* Erichsen, p. 757. Of Mr. Gay's cases, eleven died out of twenty-two; and so of many others.

cases is considered, *i. e.* 24 : 8, the results are more favorable. It will be seen that on the whole the operation for strangulated hernia is attended with a greater amount of mortality than lithotomy, amputation (excepting primary of the thigh), or indeed almost any other which falls to our lot to perform.

Of the average age I cannot speak positively. My notes from which the age is taken include the cases of other surgeons as well as my own, and a surgeon's note-book is not intended to be an exact register. I may, however, say, that in 30 cases of femoral hernia, where the age *is* stated, it gives rather more than fifty-seven years as the average, and in a large proportion of others, where the figures are not given, the patients are entered as "old." In inguinal and scrotal it was much less: 16 cases are stated, giving an average of forty-seven years,* but this includes a lad of eighteen and a boy of eight. This statement of age accords with those of much more extensive sources.

Average age.

This question of age as regards the operation for strangulated hernia is by no means a matter of merely curious speculation. In the first place, the much greater frequency may be attributed to the fact, that the liability to hernia increases in a very great proportion as people grow older. Thus (quoting Malgaigne, on the authority of Mr. Erichsen, p. 735) while at twenty-one the proportion of persons having hernia is 1 in 32, at seventy-six it is 1 in 3. If so, we need not wonder at the number of cases

* Mr. Bryant, in a very interesting memoir, published in the 'Reports of Guy's Hospital,' 1856, gives the average age in femoral hernia at fifty-five; inguinal, forty-three.

of *strangulation* in advanced life; not greater, probably, in *proportion* to the total number of persons so afflicted than at an earlier age. In the second place, it would lead us to doubt the validity of the opinion so generally entertained, *of cases of strangulation in old people bearing a chronic character*. If, as appears, strangulation occurs in so large a proportion of instances in advanced life, and if, also, the larger number of cases which occur altogether are of an acute character, as I believe they are, we must not be misled by the supposition that age affords presumptive proof of its being otherwise than acute. As far as my own experience goes, a reference shows that in the *majority* of cases in advanced age the character was severe and rapid.

The prevalent opinion that strangulated hernia in old people is commonly of a chronic nature very doubtful.

There was no case of inguinal hernia in a female operated on. A circumstance which shows that it must be comparatively rare; and I know of only one of strangulation, which was returned in this hospital by the taxis. There can be no doubt of its occasional occurrence; and it is very remarkable that this form of hernia *without* strangulation is by no means infrequent, for it appears from the table given by Mr. Lawrence, p. 11, that out of 15,786 females receiving trusses from the London Society, 1383 had inguinal hernia.

Inguinal hernia in the female very rare.

I may in this place make some remarks on the diagnosis of this form of hernia in the female. It is commonly grounded on the fact, that Poupart's ligament is situated

Diagnosis of inguinal hernia in the female as at present accepted in cases where very large, not satisfactory.

above it, and this is a sure distinctive mark when it can be made out, but it frequently happens that it cannot; that the tumour is so large, and *so little moveable*, that the course of the ligament cannot be traced. I refer to two cases, *i. e.* No. 4 in my Table of Recoveries, and No. 6, Fatal in Private, occurring to myself. I have seen it in the practice of others; and I further refer to three cases narrated by Mr. South,* with no reference, however, to the diagnosis. I would then submit the following considerations. If the hernia be true inguinal, it must of course come through the inner ring, and take the usual course into the groin and labium; but in such cases as these the cause of obscurity is *that the tumour mounts nearly to the spine of the ilium*, a fact which of itself, I think, declares its nature. I am not aware that this has been pointed out as a ground of diagnosis; to me it seems conclusive, for in no other case does it ascend high, except in the congenital hernia of males, and then not to the same extent.

An additional source of diagnosis submitted.

Time the most important element in the results of hernia.

Probably *the most important element* in the consideration of treatment, is Time. *How* it operates so adversely, an attempt will be made to show more particularly hereafter. As a general principle, the danger seems to be in an inverse

* Vol. ii, pp. 75—77. Mr. Luke also, while describing the extent to which femoral hernia often overlaps the ligament, says, "When the tumour thus rises over Poupart's ligament, there are not any certain means of ascertaining the precise seat of the stricture until the ligament itself is exposed by the operation." (p. 111.) So also Mr. Gay, 'Medical Times and Gazette,' August, 1858.

ratio as respects its lapse. All authorities are now agreed upon this, and the best have long been so, but the measure must not be taken too broadly. It is strictly true in its general application, but it greatly differs in different cases. It is not safe to measure it by days or hours; as great an advance in danger shall occur in one case in twenty-four hours, or less, as in another in three or four days; indeed there are many cases of death on record, within twenty-four hours; and I may add, what is highly important, that the degree of pain or tenderness of the abdomen, or other symptoms, often afford no true criterion for judging as my own cases, and many others, will show, though doubtless the contrary is more generally true. The distinctions, moreover, which have been made of acute and chronic, incarcerated and strangulated, &c., appear to me to be only partially just, and therefore rather calculated to mislead than to assist. They are, I submit, only questions of *degree*, and the degree is apt to change with *unexpected rapidity*. Certain points, however, may be admitted as affording *probabilities*, *i. e.* that an old hernia will be less rapid in its progress than a recent one; a large than a small; an inguinal than a femoral; an omental than an intestinal—but as regards omental, it should be well considered that although before an operation we may sufficiently ascertain the presence of omentum, we can never positively ascertain the absence of intestine. A merely omental hernia would justify delay, if the point could be determined; and if free

Qualified in different cases.

The distinctions usually made as to the character of herniæ, as acute or chronic, incarcerated or strangulated, doubtful, and perhaps deceptive.

passage of the bowels exists in a hernia of omental character, it may, perhaps, be assumed that it is so. Although omental herniæ are less dangerous than intestinal, I may be permitted to express my doubts whether the case is not very much otherwise *as regards omento-intestinal;* but I shall reserve my observations on this point until my cases are stated.

Omento-intestinal probably the most dangerous.

To return to the question of time. There can be no doubt that, as a general principle, when measures which are known to be worthy of trial have fairly received it, nothing but constantly and rapidly increasing danger can be expected from delay in the majority of cases; still many occur when—either from their being purely omental, or, if intestinal, of no extreme character, or, it may be, a simply inflamed hernia, or where the symptoms may be suspected to arise from causes occurring in other parts of the abdomen, and which, although coexisting with the hernia, may not have proceeded from it (as well shown by Mr. Pott)—doubts may well be entertained as to the propriety or time of operating. These are cases requiring the greatest judgment, and the most careful watching. An unnecessary operation may be performed, and prove fatal; or a necessary one be unduly postponed, and the opportunity for relief lost.

No delay allowable after due recourse to trials of probable avail, with the exception of certain cases of doubtful character.

On the methods of relieving strangulated hernia I shall now offer such remarks as have occurred to me; and first as regards the taxis. All reports

The taxis.

confirm the fact, that the chances of death, when it succeeds, are exceedingly small. (This will bear on an argument to be stated hereafter.) Mr. Luke records 206 cases relieved in the London Hospital without a death.* I have myself never known a death to occur when the taxis has succeeded, nor can I find a case to have occurred to any of my colleagues. It is, however, fair to state, that Mr. King has given 4 deaths in 40; Mr. Textor 9 in 114;† but all other evidence is quite contrary. Dessault's axiom is well known: "Think favorably of a hernia which has not been handled before an operation." This, I submit, may be modified. *It is not because it has been handled, so much as because its not answering to the handling shows that it has made too great progress to be otherwise than dangerous.* Again, I may say, that however urgent the symptoms may have been, if the taxis has succeeded they have almost invariably subsided, and *soon ceased.* A person may have had pain in the abdomen, especially at the stomach, vomiting, hiccough, and great pain at the stricture. The contents are returned; instant relief is proclaimed; the symptoms cease, and the bowels are promptly moved. To this fact I shall again refer, but it is necessary to bear its extreme importance in mind, inasmuch as it has been the tendency of late to caution too strongly against attempts to relieve by this method,‡ or

If accomplished almost invariably saves life.

The symptoms speedily ceasing, however severe.

* Page 101. Mr. Ward's testimony, derived from the experience of the same hospital, is strongly to the same effect. ('Lancet,' Jan. 19, 1856.)

† Luke, p. 101.

‡ Mr. Macilwain, whose treatise I received since this memoir was pre-

at least to limit them. There can be no question that in every case where the taxis has been attempted, and does not succeed, the contents are more or less damaged by it; but when the full amount of benefit it confers, if successful, is duly appreciated, and when the mortality under either operation is contrasted with this, a considerable degree of risk may be fairly incurred to obtain so great an immunity. Any force must be employed with great discretion when the hernia has been of long continuance, or is very tender; but in a recent case, where not so, the attempt should not be hastily abandoned, for by so doing, unless one of the operations be immediately performed, the chances are that the hernia may run into an irremediable condition. (Cases do occur, no doubt, where the bowel has given way under the attempt, but they are not common: I never met with an instance.) The *interval* which is often allowed to elapse between the abandonment of the taxis and either operation, for the sake of trying other methods, is often more fatal than the taxis. Mr. Key* advances an objection to the taxis which I think may be met. He states that the contents of a hernial sac, having been bruised by the force used, are in the same condition as other bruised parts, if a

A comparison with the results of either of the decisive operations by incision, justifies a fair and full trial.

The adverse results which are imputed to the taxis are more justly attributable to the delay occasioned by vain attempts by other means.

An objection to the taxis alleged by Mr. Key hardly sustainable.

pared for the press, has given some very useful observations on the criteria, which may enable us to judge of the probability of the success of the taxis under different conditions of strangulated hernia.

* Pages 58 and 59.

wound be superadded, and he employs this as an especial argument for not opening the sac, and exposing them to the contact of air; but the analogy, I submit, is imperfect. In ordinary contused wounds the parts beneath *remain* subject to the influence of the wound, with which they are continuous, but after the operation for hernia the contents, bruised if they have been, are commonly *removed into the abdomen;* at the same time it must be allowed, that if the external parts take on an unfavorable condition, and lymph has not barred the communication with the abdomen, to a certain extent, the influence of this condition may be extended to them.

Means auxiliary to the taxis.

In aid of the taxis there are various auxiliary means: a few remarks on these may not be out of place. *Warm bath.*—As far as my own experience goes, I should say this has been the most generally successful agent, and, if it fails, the least injurious. To give it every chance it should be long continued, and the bath itself calculated to afford perfect facility for placing the patient in the most favorable position, so as to give the manipulations of the surgeon every chance, and he, too, should be placed favorably, to maintain a careful and continued pressure.

Chloroform.—It may be presumed that if warm bath, chloroform, or tobacco serve, it is mainly by relaxing the stricture, and the resistance of the abdominal muscles; if the former, it must render doubtful the opinions of those who do not allow any contractile power to the stricture; but of this more in the sequel. I have

seldom seen it succeed, and it is at all events a matter deserving consideration, that *as it supersedes the expression of pain, we cannot calculate the degree of injury our manipulations may produce.*

One objection to chloroform.

Tobacco.—Chloroform seems to have been much accepted in lieu of tobacco; but I conceive it is a great mistake to consider their *modus operandi* analogous. Both will occasion muscular relaxation; but chloroform does not unload the capillaries; still more, it does not seem to produce *the remarkable influence on the peristaltic motion of the lower bowels which tobacco injections occasion.* It is by so doing, as I believe (the muscular resistance of the *viè animale* being at the same time suspended), that the imprisoned portion of the bowel is often extricated.* Tobacco, however, is not always safe; still more, it involves delay, for if unsuccessful, it is not wise to operate in the subsequent collapse; furthermore, it is a consideration, whether peritonitis be existing, or supervene, and if so, being of low type, this may not be enhanced by this agent. I have often seen it succeed, however, and it has the sanction of great authorities.

Peculiar powers of tobacco, perhaps not sufficiently estimated.

The Long Tube, recommended, and justly, by Dr. O'Beirne. I have seen three cases relieved by it. With respect to its *modus operandi*, I am inclined to think that it is partly on the principle just stated, *namely, that*

* I believe there can be little doubt of this effect being produced by tobacco. I am not aware that this double effect has been noticed as regards hernia, but it may have been.

it mechanically excites the peristaltic action downwards of a long portion of bowel, but by allowing injections to be thrown high up, it further serves, on the same principle. It has not liberated any amount of imprisoned flatus, in the cases I have seen, and as the tract of bowel below the hernia is generally contracted, it may be doubted whether, flatus not being present there, it affords much benefit in this way.

Traction from within.—The object of the taxis is to press back the contents, by a force acting from without; the last two agents are calculated to withdraw them, by a force acting from within; a more purely mechanical but really not less scientific plan, is one, now rarely adopted, excepting by the common people, who, however, do it very awkwardly; namely, employing the traction produced by the weight of the bowels themselves. A method recommended by Pott, and other great surgeons, is not to be lightly thought of, and if due care be taken to relax the resistance of the abdominal muscles, while the pelvis is raised to a vertical position, it is worth a trial. I have used it, but rarely, and then without success, but I have known better fortune to have attended the attempts of others.

Obstinate contraction of the abdominal muscles and tension from flatus constantly afford serious obstacles to reduction.

A very serious obstacle to the return of the contents, and one not sufficiently estimated, is the muscular resistance of the abdominal parietes, especially when, as often happens, the bowels are inflated. A mode of eluding this has been lately proposed by Dr. Buchanan,* and is well deserving of trial.

* 'Glasgow Med. Journ.,' July, 1856. The effects of this resistance are also dwelt on by Mr. Macilwain.

Topical Remedies.—In those doubtful cases, where there is reason to suppose we have to deal with an inflamed, rather than a strangulated hernia; also in cases, of no urgent character, or in those which are in all probability, purely omental, leeches, fomentations, and poultices, are often of essential service; but in cases of a decided character it is a loss of time to employ them, as far as I can judge.

Of extreme cold, produced by ice or otherwise, it becomes me to speak with great hesitation, considering the high authorities which commend its use. I have rarely tried it myself, but I have seen it often employed by others, and with little or no success, as far as I can recollect. It is a plan calculated to do harm, if it does nor succeed, for the bowels are little intended by nature for such treatment; and, indeed, as regards the principle on which it acts, unless very carefully applied, it *may* counteract its own agency, since, *if* the stricture is capable of contraction, that may be influenced as much as the contents. While upon this subject, I may refer to a case, which remarkably showed the sympathy between the descended bowel and the general system, namely, a large scrotal hernia, No. 3, Tab. 1, when the patient was in such a state of utter collapse, that I durst not operate, and when no *internal* stimuli rallied him I had the part stuped with hot spirituous fomentations, and it succeeded in establishing a general reaction, when I operated with success.

Great sympathy between the contents of the hernia and the general system.

Of *General Remedies* little need be said. All surgeons are agreed, that opium is often useful, especially when delay is an object for any reason, especially as Mr. Hey

has advised, when patients are to be removed to long distances for the sake of operation. Purgatives, generally speaking, to be avoided, excepting as enemata, which are often useful, especially in the doubtful cases before alluded to. General bleeding of late years has much fallen into disuse, perhaps more than it ought; I employed it with advantage in my earlier practice, and I think a fair statement would be this: that to reduce a strangulated hernia, faintness being often the most efficient agent, if bleeding is carried to this extent, it may serve, like tobacco and warm bath; but beyond this, its effects must be taken both for good and ill: for good, when there is an existing peritonitis of sthenic character; for ill, when it is the reverse; in every case, therefore, the plan adopted must be based on the merits of that case.

Operation by opening the sac.

I must next proceed to speak of the operation itself. In my own practice I have, with one exception, adopted the old method of opening the sac, and to that my observations will chiefly apply; hereafter, I shall venture to examine the respective merits of the two, resting upon data which have been before alluded to; but this I may at once say, that in a large proportion of inguinal herniæ, and in a considerable proportion of femoral, there is strong reason to suppose that the method by opening the sac, will continue to be practised, and therefore if it be in my power to give useful information upon this point, the attempt may not be without its value. The remarks I have to make, will be chiefly, on the difficulties to be

encountered and surmounted. The general principles on which the operation is to be conducted, have been amply set forth in numerous works.

1st Stage.

The surgeon before he commences an operation for strangulated hernia, after having determined the kind by the anatomical relations of the protrusion, has still many things to consider, some of these may be estimated before, others only during the operation.

Indications from the state of the scrotum.

First for the surface. The state of the *scrotum* in inguinal hernia may afford some criteria. If it is red and inflamed, so will be the investments beneath, and probably the contents, and a good deal of troublesome hæmorrhage may be calculated on. If it is dusky, it indicates a state within, bordering on gangrene. If, on the first incisions, a putrid odour is perceived, gangrene will have commenced. If a fæcal odour is perceived, cæcum probably will be found, and this is not to be confounded with the putrid smell of grangrene; such at all events has been my own experience in scrotal hernia.

The existence of *omentum* may often be recognised by the feel; but it is very liable to be confounded with layers of granular fat, especially in the thigh, of this I have seen some remarkable examples, and there are cases on record in which this has been cut away under the persuasion of its being omentum. If, however, omentum presents itself, it is a safe point on which to make an incision.*

* Mr. Prescott Hewitt has given some very interesting cases, where the omentum surrounded the intestine as a quasi sac, and Mr. Lawrence

Investments afford another point of difficulty. By pinching up all that intervenes between the surface of the absolute tumour, some judgment may be formed of the thickness of the common integuments, but when we come down on the tumour itself, nothing can be more uncertain. Great labour has been bestowed on the anatomy of those which are purely normal; but, although they may be assumed to exist in every case, their relative thickness, and the number of additional cellular laminæ, especially in femoral hernia, often produces great perplexity. In some cases they are altogether so thin, that the operator comes down at once on the contents; in others they are multiplied, and very thick; and the worst of it is that, contrary to all reasonable expectation, they are sometimes thick in comparatively recent herniæ, and thin in those which are old; and the same observation applies to the young subject and to the old. Again, while some are thick, others are thin, in the same hernia. And of the sac itself, it may be said, that while it is not unfrequently of such tenuity, as to resemble a soap-bubble, to use Sir Charles Bell's illustration, and so transparent as to transmit the appearance of the intestinal surface, in many instances, on the contrary, it has become very thick, and even almost cartilaginous, and stood open when divided. On the diagnostic signs of intestine, sac, and fascia propria, I offered some observations,

Extreme variety in the state of the investments.

Great difficulties presented by the immediate investments in many cases.

(pp. 309, *et seq.*) has also adverted to the various ways in which omentum complicates, not unfrequently, these cases, and produces extraneous strangulation.

which were honoured by publication in the first volume of the 'Provincial Medical and Surgical Transactions.' On this point, I shall only say, that I not only shewed from my own cases, but from the works of Sir A. Cooper, Sir Charles Bell, and Scarpa, that we may have adhesions of fascia superficialis to fascia propria, of fascia propria to sac, or of sac to intestines. A mistake in this matter may lead to a puncture of intestine where the sac has been divided without having been recognised, and the intestine treated as sac; or where, as may unavoidably happen, the sac itself thin has adhered to the intestine, and both being raised on the forceps have been divided together. This, at most, amounts to a puncture, and may be easily secured by passing a ligature round it; but even this is not a matter of indifference, and cannot be too carefully avoided; it is, however, a very different affair from the gash sometimes made into the intestine in dividing the stricture, a misfortune not easily remedied, and often fatal. Mr. Erichsen has proposed, in opening the sac, if difficulty occurs, the plan of raising the presenting part on a *hook*, where it cannot either be pinched up by the fingers, or the forceps; and it ought to be borne in mind; a hook is always at hand in the shape of a tenaculum.

Fluid in the sac as a protection in the operation.

As regards *the fluid* contained in the sac, it is a most important protection to the bowel; and as a sign that the true sac has been opened, is generally, but *not always*, an indication.* When it exists in quantity, its presence can often be

* Case 22, "Recoveries."

predicated before the operation, both from the feeling, and from another diagnostic sign, very important but often very deceptive. The surgeon during the taxis may have reduced a part of the tumour. He may think he has reduced intestine or omentum, whereas it is neither the one nor the other; it is fluid. Intestine rarely goes up without a gurgling sound, omentum does; but it appears to me that it goes up in bulk, and rarely comes down again, while fluid is slowly emptied, and presently returns. *The tenderness, pain, and hardness at the ring remains the same.* The hernia has not been reduced even in part. Whatever promise the tumour itself may hold out, as regards tenseness, or tenderness (and it varies much), the state of the parts at the ring afford the only reliable indication.

Often deceptive as regards partial reduction.

The state of the parts at the ring the only reliable indication.

There are other considerations which I would venture to offer, as connected with this subject. If the fluid can be returned, it argues that the stricture is not of the closest nature. If no reduction in bulk is made by the taxis, it argues either that there is no fluid in the sac, or, if there is, that the stricture is too close to allow it to pass.

Further indications offered by the presence or absence of fluid.

The *condition* of the fluid is not without significance. It may be limpid, indicating mere obstruction, or otherwise showing inflammatory processes. Again, when the stricture has been divided, it not unfrequently happens that a gush takes place from the abdomen; the inference clearly is, that there is active congestion,

Its condition also indicates mere congestion on the one hand, or inflammation on the other and its kind.

or, it may be, inflammation of the peritoneal cavity; in this event, the more the fluid departs from the character of serum, the worse is the indication; so, too, of the quantity, which is sometimes so great, and so deep in colour, that it alarms the operator lest it proceed from hæmorrhage. It not unfrequently happens that when the sac contains little or no fluid, the abdomen may much. The reason I take to be this: That the processes of inflammation *are in abeyance below the stricture in consequence of its extreme tightness, while from the same cause they are in greater activity above.*

Inference to be deduced from the sac containing little or no fluid, and the abdomen much.

When fluid exists in the sac, it would always afford a safe point for opening if it can be in any way ascertained; but it may be only in very small quantity; and it may be only in part of the sac; and this must necessarily be the case when there are adhesions. In scrotal herniæ, it is most likely to accumulate in quantity at the bottom; but that is not a place where we choose to make an incision. *Pressure, however, from the bottom,* may force it into a less objectionable part.

On the nature and pathological anatomy of hernia, great labour has been bestowed, with the exception, perhaps, of the contents, but to the changes which take place in the protruded parts an equal degree of attention has not been paid; where, however, it has, that attention has brought its full amount of important information. Thus, the changes which arise from the nipping of the bowel at the point of stricture, of late, duly noticed by many

The pathology of the contents of hernia less attended to than the anatomy of natural structures concerned in it, although highly important in various ways.

eminent pathologists, and by none more ably than by Mr. Lawrence, will probably be found to produce, when all the bearings are considered, more practical influence on the results of the operation than any other circumstance whatever, except lapse of time, with which, indeed, it is immediately connected; but the changes in the bowel below are well worth attention. These also depend upon the duration and degree of the stricture. If that be extreme, the parts perish as if tied by a ligature (the gangrene of *obstructed* circulation). If the degree is less, they may inflame,* that inflammation running into gangrene from *difficult* circulation. In a less degree, we have lymph effused on the surface or adhesions. In a still less degree, the state is simply one of congestion, bordering on inflammation; and in proportion as the approximation is greater or less, we have red or turbid fluid, or simple serum. If inflammation has not been established, the surface of the bowel remains polished; if inflamed, often otherwise; and this test of the presence of bowel during the operation, much relied on, loses in some degree its value. I had a case (No. 26, Recoveries), where the effused lymph had become œdematous; and a similar case is related by Mr. Lawrence, page 17. In cases of long or severe strangulation, ulceration at the strictured part may be the result, as stated above, and the bowel may give way at the time that is divided, or afterwards, and more fatally, within the abdomen. If it does not give way, it

* The intestines which have descended have been commonly spoken of as inflamed: in some cases the stricture is so tight that they have not power for inflammation.

still may maintain the obstructed state of the canal, rather from suspending the downward action of the bowel, than from absolute narrowing, though to a certain extent existing, (a circumstance, however, which appears to have originated Mr. Travers's strong impression that the bowel was paralysed). Furthermore, by so doing, and exciting inflammatory action in its new situation within the abdomen, it is an influential cause of the peritonitis so often fatal. The bearings of this important fact on the result of both operations, will be hereafter adverted to.*

2D STAGE. Division of the stricture.

The preceding observations bear much on the difficulties which present themselves in the first stage of the operation, the opening the sac when that is the purpose; the next is the division of the stricture or strictures. The remarks I have to make will chiefly apply to femoral hernia. Some surgeons of the highest eminence dwell much on the production of the stricture by different fasciæ, cinctures of condensed cellular substance, &c., as well as the well-known fasciæ and ligaments; it would be presumption in me to doubt such authorities, but I am bound to say that in all the twenty cases of femoral hernia on which I have myself operated, I found the stricture corresponding with the edge of Gimbernati's ligament,†

* It is with reference to that part of the subject that this brief description is chiefly given. This statement is founded on my own observations. It differs not much from that given by Lawrence and Erichsen.

† Mr. Luke, in his important memoir, adverts (pp. 112, 113) to the stricture in femoral hernia having been frequently produced by bands of the fascia propria. It is possible, but I think barely so, that I could have mistaken the edge of Gimbernati's for this, in the cases I have related.

and relieved by dividing that in every case but one, and that was No. 21, Recoveries, when a large mass of omentum could not be returned and Poupart's ligature was also partially divided to free the constriction. It may savour of presumption in me to condemn the use of the director, but it is liable to grave objections; and I have seen the intestine wounded several times when it has been employed, unless the escape of fæces in these cases may have been owing to the gut giving way at the ring when the stricture was divided;*) even the deep-grooved curved director is but an insufficient guard when the intestine is tense and the folds turn over; granting also the aid of an efficient assistant (not always to be obtained). Directors with wings, or a spatula as proposed by Mr. South, may be employed to lessen the danger, or a plan which many years since I suggested when assisting one of my colleagues. The sac contained a knuckle of intestine. Two fingers of the operator had kept it back. The director having been introduced in the groove between them, I kept the handle firm, while he easily and safely divided the stricture with a curved bistoury.

Objection to the director.

A plan employed to make it safer.

I may suggest that there is another source of danger, which, as far as I can find, has too much escaped observation, and is not sufficiently guarded against; namely, that as there is not only intestine below but above the

* The recommendation we so constantly meet with, of drawing down a portion, is not free from doubt. The bowel above the stricture is commonly dilated; if the stricture has existed long, and been very close, nipping the bowel till it has been softened, it may give way if any, but the most moderate, force be employed.

Distended state of the bowel above the stricture a not unfrequent cause of disaster probably, but not attended to hitherto.

stricture, and as that is generally *much distended by flatus,* it will be exposed to mischief, not sufficiently guarded against by the director and knife as commonly used; and I am inclined to think, that when the gut *is* wounded in dividing the stricture, it is as often this part as that below which suffers. I may be permitted to mention the mode I have adopted to obviate both these risks. Great as the difficulty sometimes is, it rarely, perhaps never, happens, that the surgeon cannot feel the edge of the stricture. Having insinuated the very point of my finger, I pass a *narrow, strong,* probe-pointed bistoury, guarded *very nearly* to the end, taking care that *its edge is sharp.* Passing this with its flat side, as soon as I have got its extremity into the edge of the stricture I turn it, press its back into the pulp of my finger, press the point of that, *so armed,* against the edge of the stricture, *carefully avoiding any sawing motion, but cut as it were with the finger itself;* this safely divides a small notch, and allows the finger to be passed sufficiently far to protect any subsequent division which may be required. In all the operations, save one, which have fallen to me, I have pursued this method, and have never met with a single misadventure.

Method adopted by the author in dividing the ring.

While on this subject I may mention my persuasion, that if the stricture requires division it is not desirable to limit that to the small extent recently recommended. A free opening enables the surgeon to return the intestine with less force; it enables him to return omentum, which he might not

Advantages of free division of stricture.

otherwise do; it enables him also to pass his finger freely into the cavity of the abdomen, to ascertain whether there is any further cause of obstruction. As regards the opening the sac at this point, it can make little difference whether it is a line or two more or less, and with reference to any future occurrence of strangulation, it is very rare, as appears from the statistical records. I only had one case myself, and that was congenital, nine years having elapsed. (No. 19, Recoveries.)

Question as to active constriction by the ring.

As regards the stricture itself, I may be allowed to offer a few observations. *Is* there active constriction? High authorities have pronounced in the negative; but it may be doubted whether these do not rest their opinions more on assumption than absolute proof. It is said, the ring itself is not muscular, therefore it cannot contract; but do no parts contract which are not muscular? a name often blinds us to facts. We have been long accustomed to connect contractile power with muscular structure, but let us take another case of strangulation, that of the glans penis in paraphymosis; the stricture here is undoubtedly caused by common integuments. [I may mention two collateral but more doubtful arguments, in favour of the opinion that the constriction is active. First, the great difference there is in the degree of constriction in different cases. Secondly, the great difference between the feel of the edge in the dead subject and in hernia.] If it be said, that it is both in this and hernia merely a chord bound round, and that the effects are owing to the engorgement of the glans; the answer is,

Analogies which support the opinion of active constriction, especially paraphymosis.

that empty the glans as you will, either by cold or pressure, it will still be found, in most cases, that you cannot reduce it; but if the patient is rendered faint, it can be returned, just as in hernia; or, that failing, the stricture must be divided as in that malady. What applies to the one case, I apprehend may fairly be applied to the other, and faintness serves, both in hernia, and in paraphymosis. The auxiliary means in the former, in aid of the taxis, are largely based on this—bleeding, warm-bath, tobacco, chloroform, &c. I may further mention, that in every case of femoral hernia I have operated on—and for the most part in inguinal—on dividing the edge of the stricture I have been aware of precisely the same sensation as is communicated to the hand in any subcutaneous operation, when the part divided is rendered tense by well-ascertained active contraction.*

Statement of the proportionate mortality in the author's practice.

A few additional observations as to the results of my own experience may not be out of place. The mortality in my private practice, as compared with hospital, has been briefly alluded to; it is a point on which I should wish to make some further remarks. The proportion of deaths to recoveries was 6 out of 12 in the former, 8 out of 24 in the latter. In the former, I met with no misadventure whatever in the operation, nor was there a moment's unnecessary delay after my arrival. One

* In cases of tapping either abdomen or hydrocele, the resistance made to the withdrawal of the canula by the clipping of the skin must be familiar to every surgeon.

cause of this difference appears to be the following. Of these 12 cases 10 were at a *distance;* and of the 6 who died, all but 1 were (as some always will be) of a condition of life which while it precluded them from the advantages of a hospital, did not dispense with pecuniary considerations; hence, consultations, the operation deferred till the last moment (one great element of danger), and subsequent visits avoided. The distance, also, from the family surgeon; the want of experienced nurses; and errors from the interference of friends, all contribute to lessen the chance of success. I have been informed that the results of private practice in London are at least as favorable as of hospital, but in London the adverse conditions do not apply. It will be seen, by a reference to the table of deaths in private practice, that in No. 1 the intestine was in a state of gangrene when the operation was performed. That in Nos. 3 and 4 erysipelas and gangrene of the scrotum supervened, and added to the danger. That in No. 6 severe peritonitis existed prior to the operation; and that No. 5, a case which appeared to be going on satisfactorily, died at the expiration of three weeks, from a recurrence of the symptoms.

As regards the 22 successful cases, it will be found, and it is a fact especially important, that there was, with little exception, *an early restoration of the downward action of the bowels;* while in the fatal cases it was generally otherwise. There has been a remarkable change in the opinions of the profession connected with this point. Surgeons now are much disposed to leave this matter to

Early restoration of the action of the bowels in the successful cases, and *vice versâ.*

nature, while formerly they were very solicitous to obtain evacuations, and doubtless founded their opinions on the fact, that where these took place early the patient recovered, and their practice was the corollary; the probabilities, however, will appear to be, that the bowels acted *because* the conditions were favorable, and if they had given aperients the benefit was attributed to these in a greater degree than was warranted; but they were men of far too high ability to allow their opinions or practice to be lightly regarded, and it may be supposed that they were partly right as well as wrong. I may be permitted to remark, that their successors also may have been led to form incorrect conclusions, from a similar misinterpretation; thus, although *no* aperients whatever may have been given, it is very certain that the alimentary canal, even after, as well as before the strangulation is removed, often pours out large quantities of secretions which are vomited. If purgatives had been given I suspect they would have unjustly borne the blame. It will be recollected that from the moment of strangulation, not only is the action of the muscular coat inverted—but of the mucous coat increased and perverted—hence the quantity of secretions thrown from the mouth, until the obstruction is relieved; and hence, after the operation, the amount of vitiated matters, remaining in, and still secreted from the mucous membrane, and which must be got rid of by the efforts of nature or art, either upwards or downwards. Again, many patients remain after the operation in a doubtful state for days, and during the whole

Examination of the facts and opinions relating to the employment of medicines acting on the alimentary canal.

time there is no stool. The patient may die or recover; if he dies, and aperients have been given, albeit without effect, they are deemed the cause; but die they often do when *none* have been given, and that, too, with a scourging diarrhœa.* As far as my own experience goes, it is rarely desirable to give aperients by the mouth, but very useful by enemata or suppositories, or to use the long tube, so as to solicit the normal action of the canal; and if once that action is restored, mild aperients by the mouth are often given with great advantage, and of these the best, probably, is sulphate of magnesia. This is apart from the consideration of combating peritonitis by calomel and opium, and apart also from the question of giving opium independently in these cases. When the action is antiperistaltic, opium by the mouth will often reverse it, still more when given as an enema, and not only in strangulated hernia, but in ileus and other inflammatory conditions of the abdomen. Opium so given, if I may be allowed the expression, becomes the best purgative, as stimulants are often the best antiphlogistics in many species of inflammation.†

Examination into the causes of death after operations for strangulated hernia.

What are the causes of death after the operation? In the great majority of cases peritonitis, often combined with enteritis,

* It is truly observed by Mr. Bryant, that a copious stool and fatal collapse often go together. ('Guy's Hospital Reports,' 1856.) He imputes the collapse to the stool; but may not the stool be the consequence of the collapse?

† In 1821, when I advanced this position, there were few members of the profession who would endorse it ('On the Principles of Inflammation,' &c., 2d ed., pp. 180—187). Not so now.

aggravated very frequently, if not produced, by a continuance of obstruction still existing within the abdomen, or by the abnormal condition of the hernia, even if wholly returned, still more if partially. The most frequent cause, probably, is, that arising from the portion nipped by the stricture.

Briefly stated.

As regards this peritonitis which is so often the cause of death in strangulated hernia, I may be allowed to observe that there are some material points of difference between it and ordinary peritonitis. The symptoms of the latter are generally clear and well marked from the beginning; in this, on the contrary, while the symptoms of obstruction are clear and decided, those of peritoneal inflammation may not show themselves, if existing; and it is difficult to say when they do or do not exist.

The peritonitis from hernia differs from ordinary idiopathic peritonitis.

In hernia there are two orders of symptoms: one arising from obstruction, namely—constipation, vomiting, hiccough, and pain at the pit of the stomach or navel; the other those of peritonitis more especially, as tenderness, pain, tension of the abdomen and pain at the navel, and in an advanced stage, tympanitis; but the pulse, so important as an indication in idiopathic peritonitis, here varies so much as to be of little value, and the first order of symptoms, not essentially inflammatory, still continues. Now take the case of hernia: the taxis succeeding all the symptoms cease, generally at once. Did peritonitis exist? If it did, it must have been so

The duration and degree of stricture determine different degrees, which may be resolved into three, producing very different results.

slight as to fade away when the cause was removed. The taxis not succeeding, one of the operations is performed. If we now have peritonitis, it would be hard to say that it had or had not existed before the operation. If not, the chances of recovery would be great; if it had, they would be less in proportion to its degree. The difficulty of diagnosis consists in the fact, that the especial symptoms do not disclose themselves, although extensive peritonitis is often found after death, even in cases where it has been little suspected; a circumstance very unusual in idiopathic peritonitis. This leads to another and by no means unimportant point: it is the application of these facts to the subsequent history of these cases. The operation may have been performed, the primary cause (without which recovery is rare) removed, but it cannot be said that in all cases "the effect surceaseth still;" on the contrary, the temporary relief which consists in the cessation of the pressing symptoms, arising merely from the constriction, is followed at no distant period by those of peritonitis, which in many instances had in reality *preceded* the operation, but was *kept in abeyance*, so to say, by the depressing influence of the strangulation (the latent peritonitis of some authors). That having been removed, after a short interval the peritonitis developes itself, and the occurrence of the symptoms, *then*, leads to a wrong conclusion. It is often attributed to the operation, or the misapplication of remedies, albeit it existed before in a

Effect of the stricture in superseding the usual character of the symptoms of peritonitis, which are masked, as it were, and not declared, although really existing. The latent peritonitis of some authors.

Probably leads to false conclusions as regards the operations for hernia and the remedies employed. The true conclusion

highly important as regards treatment.

masked form.* These remarks are not merely speculative. They bear importantly, not only on the foregone conclusions stated above, but also upon a point hereafter to be considered, namely, the causes of mortality after both operations—that by not, as well as by, opening the sac. They further bear immediately on the question of treatment, for we must not be lulled into a false security by the apparent relief afforded by the division of the stricture. Peritonitis may develope itself after an interval more or less long, but it is the early indications which it is most important to watch and to meet.

Peritonitis, whether it has existed before or occurred subsequently to the operation, if not complicated with irremediable conditions, may and often does yield to appropriate treatment, but its type is commonly low, from the degraded condition of the bowel, as low inflammation anywhere will communicate its impress on the whole system. The peritonitis also is often maintained by the continuance of an internal strangulation, either complete or incomplete, it may be, from the effects of an unrelieved stricture in the sac. With

The type low.

The peritonitis often maintained by internal strangulation.

* Mr. Paget gives a different interpretation of the fact, *i. e.*, that in some cases the symptoms of peritonitis display themselves immediately, in others more remotely. The first he refers to the local cause; the second, to blood-disease. ('Med. Times and Gazette,' Sept. 15th, 1858.) I need not say, after the remarks I formerly made on the changes produced in the blood by accidents and amputations, that I should not be adverse to such an explanation, were it not that the phenomena appear to me to be much more satisfactorily explained, as I have now attempted to do. At the same time every deference is due to his opinion.

the exception of the latter, the cause may depend upon circumstances beyond our control, or upon such as are calculated to elude observation; *e. g.*, a single small hernia may be returned, with very moderate force, within its sac, if not opened if the sac does not adhere to the surrounding parts, and if the sac be thin, the fact not discovered. Again, a small recent hernia may come down behind an old one inclosed in its own separate sac, and be carried back by a force which correctly returns the primary and lower portion; and if there be stricture in the neck of the recent hernia, the surgeon may well be in entire ignorance of its existence. When the sac adheres to the surrounding parts, this will hardly occur; but if the sac be recent, not adhering to the surrounding parts, but gripping the bowel with its neck, it may very readily happen. Among my own cases will be found examples of a hernia returned in this way into the cavity of the abdomen (not between the peritoneum and abdominal muscles). A remarkable case of internal strangulation by a band of mesentery, high within the abdomen, and proving fatal;* and, again, others where the omentum was stretched down in its natural membranous form, and had formed recent adhesions to the front of the bowel, and thereby materially contributed to a fatal result, by impeding the restoration of its functions, a condition of such frequent occurrence as to deserve the notice it has lately obtained.

* Mr. Solly, in the last volume of the 'Med.-Chir. Trans.,' relates a very similar and interesting case; indeed they are far from unusual. To this I shall revert in its place.

Frequency and fatal severity of erysipelas and gangrene after operations for hernia.

The only additional remark I shall make relates to the frequency, severity, and fatal tendency of erysipelas and gangrene, especially of the scrotum, after the operation for hernia. The looseness of its texture explains the frequency of the occurrence of erysipelas; but, as far as my own experience goes, that is much more prone to run into fatal gangrene than it is after any other operation in this part. I have myself never known a fatal case after castration, or the removal of a cancer scroti; and I have known many instances of recovery even after urinous infiltration. It is not improbable that the condition of the viscera after their return, especially in the parts contiguous to the ring and continuous with the external wound, may exert an evil influence. Inflammation of the external parts consequent on the operations for strangulated hernia appears hardly to have received the attention it deserves; and I, therefore, state the facts which the examination of my own cases discloses.

In the table of recoveries, twenty-two in number, there occurred, No. 2, "sloughy abscess of the groin; No. 12, "troublesome suppuration;" No. 20, "wound, erysipelatous and sloughy;" No. 6, "great swelling of the scrotum."

In the table of deaths in private practice, out of six cases No. 3 had "erysipelas and gangrene of scrotum;" No. 4, "erysipelas of scrotum."

In the table of deaths in hospital, out of eight cases there were, "erysipelas," Nos. 3, 4, 5, and 8; also, in No. 6, "extensive sloughing in the iliac fossa and upper

part of the thigh;" so that out of thirty-six cases there were eleven who had this form of diffuse inflammation, and two had the erysipelas showing itself also in distant parts, proving the contamination of the blood. Two others, whose death was very speedy, might not improbably have proved additional cases had they lived longer.

If all these had occurred about the same time, it might have been supposed that they arose from some epidemic constitution; but when it is considered that they were spread over a long period, and presented themselves in various situations, this cannot be admitted as a cause. That the disposition is more frequent than is, perhaps, generally considered, is further borne out by the record of cases quoted hereafter from the 'Medical Times and Gazette,' and it may be suggested that a more attentive investigation of this subject is called for.

If erysipelas of such an untoward character is a frequent result of these operations, it is a fit subject of inquiry why it is so—what are its influences; and how best obviated. Erysipelas is, in fact, but a name for a kind of inflammation which has many varieties, but is essentially the same in all. Its essence consists in the failure of the adhesive, *i. e.*, the limiting process—its character to effuse sero-purulent fluid upon or under the surface, and, from want of adequate power, to mortify. The causes suggested.

In hernia, whatever may be the power of the individual, the strangulated parts are, *ipso facto*, deprived more or less of theirs, and when returned into the

abdomen are, for a time at least, in a *low state of inflammation.* The external wound offers a continuity of surface, and if this is not speedily interrupted by the adhesive process, the type of inflammation of these returned contents is extended to the external parts, and hence the low character of the inflammation there, which, if not speedily met, spreads, and spreads in the form of low erysipelas.

Again, while such is the influence communicated from within, the external inflammation will, by the same rule, reciprocally produce a lowering type in the inflammatory processes going on there, and augment a risk already but too great. Such I believe to be the true import of such cases.*

What, then, it may be asked, are the rational means of reducing these risks? In the first place, I should say, Petit's operation, when practicable, for it leaves the sac as a barrier between the external wound and the hernial contents; and, furthermore, the small incision usually made is less liable to such inflammatory processes.

What measures calculated to prevent it.

Again, when the sac has been opened, or in any case where, on the division of the stricture, fluid has passed from the abdomen, indicating inflammatory action going on there (always, be it remembered, of a low type),

* In speaking of the phenomena of inflammation, as connected with the present subject, I have not adopted new terms, which to me appear not more expressive than the old, and I may perhaps be forgiven for adding, that there is much reason to think that pathologists of late have been too much engrossed "in minimis," to the neglect of those great principles governing the animal economy which are of paramount importance.

care should be taken not to block up that fluid, especially where the sac has been opened, for nothing tends to aggravate the evil so much as keeping corrupt secretions pent up. Furthermore, the external inflammation should be promptly treated by those means which best combat erysipelas, and which, as I have elsewhere endeavoured to state, I need not now repeat; but I should wish to impress this illustration—that as a fire is more difficult to control the more it spreads, so is a spreading inflammation.

I shall now proceed to give the *whole* of my own cases, in the tabular form before stated; and first, the recoveries, both in hospital and private practice; secondly, the deaths in private practice; thirdly, the deaths in hospital practice, and the autopsies when they could be obtained. In private practice I am unable to give one; for which this reason may be assigned, that great popular objections exist in this part of the country, and they occurred among a class in which these are very strong, and, as all were at a distance, there was a greater difficulty in combating them.

TABLE

No.	Date.	Kind.	Age.	Sex.	Duration.	Strangulation.	Vomiting.	Constipation
1 Private	1821 Oct. 18	Scrotal	60	M	Many years	Three days	Yes	Yes
2 Hospital.	1822 Aug. 29	Femoral	35	F	—	Five days	Stercoracious	Yes
3 Hospital.	1825 Oct. 18	Scrotal	45	M	Quite recent	Three days	Stercoracious and hiccough	Yes
4	1826 April 12	Femoral	40	F	Two years	Three and a half days	Yes	Partial discharge

rness of elly.	Tenderness of rupture.	Contents.	Bowels moved after Operation.	Remarks.
es	Yes	Intestine only	Following day	An old hernia, and he had worn a truss. Investments were thick, excepting sac, which was thin. Stricture in the external ring, Little fluid. A shattered and gouty constitution, and saved with difficulty.
es	—	Omentum only	Following day	Went on very well for three or four days. A sloughing abscess then formed in the groin; part of the sac and omentum sloughed, and fæces were discharged. Oct. 10th, discharged "quite well."
es	Great color, tending to livid	Intestine only. A part of the circumference gangrenous	The same night	The operation was performed eight hours after admission. He at first refused consent. Tobacco clyster was tried, and produced great collapse, which was overcome by internal stimuli, *and hot stimulating fomentations to the part.* Although recent, many layers. Considerable quantity of fluid, highly offensive. Extensive and difficult adhesions. The whole intestine returned, including a portion of its calibre which was gangrenous. Great relief from the operation. On the 22d, fæces appeared at the wound. On the 24th, they resumed their natural course, after which everything progressed favorably.
Jo	Not much	Intestine adhering	Within twelve hours	It was a large hernia, and *Poupart's ligament could not be felt.* Supposed, at first, to be inguinal. Sac so thin, that at first it escaped being opened, as it was supposed to be intestine which presented;

No.	Date.	Kind.	Age.	Sex.	Duration.	Strangulation.	Vomiting.	Constipation.
	1826							
5	Nov. 16	Scrotal. Congenital	18	M	Sudden, from blow	Thirty hours	Yes	Yes
	1828							
6	July 31	Scrotal	67	M	Old	Seven days	—	Evacuation before the operation, probably accounted for by the stricture not being very tight, and the reduction prevented rather by the bulk of the cæcum than by the tightness of the stricture
	1832							
7	April 1	Femoral	72	F	Four years	Five days	Slight	Yes

Tenderness of belly.	Tenderness of rupture.	Contents.	Bowels moved after Operation.	Remarks.
				the ring was then freely divided, but the contents could not be returned till the sac was opened. There was then found no fluid, but extensive adhesions. April 24th, "Progressing quite favorably."
Yes	Tumour large, tender	Intestine	None for two or three days	Tumour extended high towards the spine of the ilium. Sac so tense that it could not be pinched up, and this was found to arise from the quantity of fluid. The testis was in the groin. The stricture at the inner ring. Its division followed by a gush of fluid from the abdomen. Had troublesome symptoms at first, but soon recovered.
Tender	Tender	Cæcum and appendix	Following day	Notwithstanding the length of time strangulation had existed before admission, symptoms were not urgent, and warm bath was tried; that failing, the operation. The contents, cæcum and appendix, and a good deal of fluid at the bottom. The intestine was a lively red, showing that the stricture was not so tight as to prevent a free circulation, and there was a fur of lymph on the surface. The reduction was rendered difficult, rather by the bulk of the cæcum than the tightness of the stricture. The scrotum, on the following day, swelled greatly; but in a few days, all the symptoms became favorable, and after the 5th, went on "perfectly well."
Not great	Not great	Intestine only	In a few hours	Tumour small. Thick external investments. Thin sack. Little fluid. Intestine healthy. No bad symptom.

No.	Date.	Kind.	Age.	Sex.	Duration.	Strangulation.	Vomiting.	Constipation
8 Private	1832 Oct. 6	Femoral	76	F	Many years, irreducible.	Two days	Yes	Yes
9 Private	Oct. 27	Scrotal	40	M	Three days	Three days	Constant, and hiccough	No
10 Private	1837 July 20	Inguinal	64	M	—	Nineteen hours	Yes	Yes
11	1838 Aug. 16	Femoral	35	F	Five years	Three days	—	—
12 Private	1842 Sept. 22	Femoral	70	M	—	Four days	Stercoracious, Hiccough	Yes
13	1843 June 14	Femoral	65	F	Several years, irreducible.	Twenty-four hours	Yes	Not stated
14	Oct. 27	Scrotal	27	M	Recent, one month.	One day	No	Yes
15	1846 April 15	Femoral	—	F	—	Two days	—	—

enderness of belly.	Tenderness of rupture.	Contents.	Bowels moved after Operation.	Remarks.
None	Little	Intestine only	Shortly after the operation; free	No bad symptom. Intestine reduced, although previously stated to have been irreducible.
None	A little	Omentum only	Following day	Large quantity of fluid in the sac. The rest, omentum, which was returned.
Great	Great	Omento-intestinal	Day of the operation	The contents not in a bad condition. The intestine was returned. The omentum could not be; it was left in the wound, which united over it. He did quite well.
—	—	Intestine	Following evening	Intestine very dark. A little fluid in the sac, a great quantity in the abdomen. Was four months pregnant. August 22d, "Wound healed, quite well."
None	Little	Large boss of omentum. Little knuckle of intestine	Shortly after the operation	He had troublesome suppuration, but did well.
Yes	Little	Omentum over intestine	In about twenty-four hours	There was a band tightly binding the centre of the omentum, which was of course divided; the omentum returned. Little tenderness at the ring. Symptoms of peritoneal inflammation followed, and the *omentum sloughed*. Discharged in August.
No	Great	Intestine only	Not till the night of the 29th, and he was in much danger until that time	A large quantity of bloody fluid in the sac. Intestines much discoloured, and adhesions, although so recent. It is also again remarked, that notwithstanding the short duration of the strangulation, the investments were very thick.
—	—	Intestine	—	State of the intestine approaching to gangrene. April 15th, "Doing well." May 10th, "Well."

No.	Date of operation.	Kind.	Age.	Sex.	Duration.	Strangulation.	Vomiting.	Constipation.
16 Private	1846 Aug. 28	Femoral	75	M	Recent	One day	Yes, Hiccough	Freely before the strangulation
17	1848 April 9	Femoral	"Old"	F	Old, irreducible in part	Two days	Operation so immediate that the circumstances were not particularly stated	
18	1849 Dec. 15	Femoral	63	F	Old	Two days	Yes	Partial relief
19	1850 March	Inguinal Congenital	40	M	Had been operated on by Mr. Fowler, of Cheltenham, nine years previously	Thirty hours	Yes	Yes
20	1850 July	Scrotal	77	M	Two years	Four days	Yes	Yes
21	1853 April 7	Femoral	50	F	Old, irreducible in part	One day	Yes	Yes

nderness f belly.	Tenderness of rupture.	Contents.	Bowels moved.	Remarks.
Little	Little	Small knuckle of intestine	Free evacuations	Investments very thick. Fat much resembled omentum. Much bloody fluid. Good recovery.
Great	Great	Omento-intestinal	Same day	Admitted in a state of *extreme collapse*, but it was not judged advisable to postpone the operation, which occupied very little time; but she was barely saved by brandy mixture. Contents not bad. Much fluid escaped from the abdomen.
Yes	Yes	Intestine	Not till five days had elapsed	Followed by collapse, and continued vomiting and constipation. She brought up two worms. Change for the better, attributable to an injection of Tr. opii ʒiss on the fifth day after the operation, which was succeeded by evacuations.
Yes	Slight	Intestine	Following day	Much dark fluid. Several inches of intestine down. Dark. Testis lying at the bottom, in contact with the intestine. Investments very thick. Sac, tunica vaginalis. Stricture rather tight at lower ring; very tight at upper. 23d, Convalescent.
Urgent	Not great, but red and firm	Intestine	Same day	There was a large and very singular effusion of lymph on the surface of the intestine, which appeared œdematous. The whole length of the inguinal canal required division. As regarded the hernia, he had not a single bad symptom. The *wound became erysipelatous and sloughy*, but he recovered, and was discharged September 12th. Mr. Lawrence mentions a similar case of œdematous infiltration.
s	Yes	Omento-intestinal	Almost immediately	Division both of part of Poupart's ligament and Gimbernat's, required on account of the difficulty occasioned by the adhesion of a part of the omentum, which could not be

No.	Date of operation.	Kind.	Age.	Sex.	Duration.	Strangulation.	Vomiting.	Constipation
22	1858 Jan. 30	Femoral	45	F	Old	Eighteen hours	Yes	Yes

nderness f belly.	Tenderness of rupture.	Contents.	Bowels moved.	Remarks.
				separated, and was left *in situ*, the free division of the ligaments removing all stricture on it. Abdominal symptoms continued, but were arrested by leeches, &c. The omentum, which remained down, kept up subacute inflammation of the neighbouring part of the abdomen. Discharged, June 16th.
Yes	Yes	Fluid, and small knuckle of intestine	Same day	Double sac. The hernia was rather large, and the greater part soft, and not tender; but near the ring, and deep, was a small portion, very hard and tender. This led me to suppose a double sac, which proved to be the case. On opening the first, a large quantity (four or five ounces) of fluid escaped, and nothing else was seen; but at the bottom of this was a small portion, of a dark colour; this, however, was not free intestine, but was contained in a separate sac, with external investments to the number of three, which being divided, intestine was exposed, and the operation finished by the division of the ring and the return of the intestine. On the division of the ring an additional quantity of fluid escaped from the abdomen. In this case there can be little doubt that there was a sac, containing merely a large quantity of fluid, and within it another, having its fascia propria; both sacs passing out through the same aperture. Lawrence quotes, from Dupuytren, a similar case, p. 505. Troublesome diarrhœa ensued. This was checked by wine and an opiate injection, and on the 13th of February she returned to her ward. Has since been discharged.

TABLE

No.	Date of Operation.	Kind.	Age.	Sex.	Distance.	Duration.	Strangulation.	Vomiting.	Constipation
1	1839 April 17	Scrotal	50	M	15 Miles	—	Two days	Hiccough	Yes
2	1840 June 7	Femoral	65	M	14 Miles	Four days	Four days	Yes, and Hiccough	Yes
3	1850 May 25	Scrotal	60	M	7 Miles	Old	One day	—	—

Deaths.—Private Cases.

Tenderness of belly.	Tenderness of rupture.	Contents.	Bowels moved.	Remarks.
Little	Great, and redness	Intestine	—	Although in a state of great collapse, and the danger imminent, he would not immediately consent to an operation, which, however, was performed four hours after my arrival. The intestine was in a state of gangrene. He died the next morning.
Little	Little	Omentum	Not	In this case there was great difficulty in distinguishing whether fat or omentum presented itself. There was no fluid, and the omentum dark, but not gangrenous. The symptoms on my arrival altogether bad. Sunk countenance, dry tongue, and hiccough. Pulse small and unsteady, The operation performed immediately. It afforded relief for a few hours, but he sunk and died on the 9th. I did not see him afterwards.
—	Very large and tense	Omento-intestinal	Yes, but not for three days	A large coil of small intestine, dark; the omentum more so. I removed a portion, which did not bleed. A large quantity of bloody serum discharged from the abdomen on dividing the stricture, which was in the outer ring. Relief immediate; but subsequently peritoneal inflammation (continued), for which treated by bleeding, &c. On the 28th evacuations, and state favorable. *Erysipelas and gangrene of the scrotum came on* and caused his death. (The incision was high up.) The abdominal symptoms having subsided. He had also retention of urine. I did not see him after the operation.

No.	Date of Operation.	Kind.	Age.	Sex.	Distance.	Duration.	Strangulation.	Vomiting.	Constipation.
5	1852 July 3	Femoral	70	F	6 Miles	Old	Two days	Yes	Yes
4	April 9	Inguinal	54	M	14 Miles	Some months	One day	Yes	Not stated
6	1857 April 22	Femoral	60	F	8 Miles	Recent	Three days	Constant, fæcal	Yes

Tenderness of belly.	Tenderness of rupture.	Contents.	Bowels moved.	Remarks.
No	Great	Omento-intestinal	Not for several days	Tongue dark. Aspect bad. Pulse little distended. On opening the sac, a little dark grumous blood escaped. Omentum and intestine both very dark. There had been no evacuations on the 7th, and I recommended a suppository with croton oil and aloes, which succeeded. On the 15th, twelve days after the operation, I had a letter from her medical attendant, stating that she was going on quite favorably; but on the 17th another, stating that there had been a relapse, and she died. I did not see her after the operation.
Great	Great	Intestine	No	Tumour very tense. Much fluid. *Immediate relief from the division of the stricture;* this continued for twenty-four hours, when symptoms of acute peritoneal inflammation required bleeding, &c., but did not succeed; and to this, *erysipelas of the scrotum* was superadded, which rapidly became *gangrenous*, and on the 17th he died. I saw him again on the 13th.
Yes	Yes	Intestine	None	The patient did not disclose the fact of her having a hernia, and the symptoms were treated as peritonitis, until the discovery was made on the morning of the 23d, when I was sent for. Relief followed the operation, but the vomiting never ceased, and she died about two days after the operation. This was one of the cases of *large femoral hernia overlapping Poupart's ligament*, and much resembling inguinal. It contained about four inches of intestine, adhering extensively to the sac; the adhesions quite recent, and broken down by the handle of the knife. The colour of the intestine not particularly bad.

TABLE III

No.	Date.	Kind.	Age.	Sex.	Duration.	Strangulation.	Vomiting.	Constipation.
1	1823 Dec. 20	Scrotal	Young	M	Old	18 hours	Yes	Yes

...tion.	...enderness of belly.	Tenderness of rupture.	Contents.	Bowels moved.	Remarks.
	...es, great, and ...ympany	Great	Cæcum	No	There were many interesting circumstances in this case. The protruded part was cæcum only, forming a tumour of the size of a small melon. On dividing the external investment a *fæcal* odour was perceptible. There was a distinct sac. There was great difficulty in ascertaining the character of the presenting part, for three inches of the intestine were exposed before a band presented itself. There was some degree of stricture in the external ring, easily relieved, but the cæcum could not be returned. This led to further examination, and a band was felt within the abdomen, which was carefully divided on a curved bistoury, as far as it was possible, without laying open the cavity of the abdomen. That *was tense in the highest degree*, and it was considered not improbable that the return of the bulky cæcum was prevented by it (a not unfrequent cause of difficulty). The ilium could be freely drawn down and returned, but the cæcum neither drawn down nor returned, nor the air it contained. The cæcum was then punctured in four or five places, with an acupunctuation-needle, replaced, and the wounds brought together. The man died in a few hours. The body was carefully examined. A band was found, nearly but not entirely divided, situated at two inches from the anterior spine of the ilium, in a line drawn from that to the umbilicus, and it resulted

No.	Date.	Kind.	Age.	Sex.	Duration.	Strangulation.	Vomiting.	Constipation.
2	1831 Aug. 20	Femoral	Middle	F	Old	24 hours	Yes	Yes
3	1832 Aug. 22	Femoral	Old, but hale	M	Old	2 days	—	—

Tenderness of belly.	Tenderness of rupture.	Contents.	Bowels moved.	Remarks.
				from a twist of the bowel (colon). The complete division was difficult, even with the parietes freely open, from the tense state of the intestine over it. The peritoneum and bowels above the cæcum highly inflamed; that, scarcely. The punctures had completely closed, and no escape of fæcal matter. There can be no doubt that it would have given this man his only chance, to have laid open the abdomen; but it is highly probable, in its tympanitic state, a volume of intestines would have been protruded, and never returned. A very similar case is related by Mr. Solly, in the last volume of the 'Medico-Chirurgical Transactions,' and there are many on record. In a similar case I should lay the abdomen freely open.
Yes	—	Omento-intestinal	Yes, following day	The hernia was large; the upper part situated in the right groin, and doubled back; this was omentum, and had been irreducible. In the hollow of the thigh a small, globular, tense tumour. Intestine separated from the former by a very close band, requiring division. The intestine very dark; this was returned easily—the omentum with difficulty. Aperients were given, and evacuations followed. Twelve hours after the operation she was reported "very comfortable;" but on the 21st bad symptoms returned, and on the 23d she died, at 6 a.m. The body was removed the same day.
—	Great	Cæcum and appendix, and ilium	Yes, speedily	Went on favorably at first, but, on the 24th, *erysipelas of the wound*, which increased, and became dusky. On the evening of the 25th, symptoms of peritonitis; and at 3 p.m. of the 26th, he died, not without

TABLE III.

No.	Date.	Kind.	Age.	Sex.	Duration.	Strangulation.	Vomiting.	Constipation
4	1843 Jan. 18	Femoral	56	F	4 days	4 days	—	—
5	1852 March 30	Femoral	66	M	Old	4 days	Stercoraceous	—

* Lawrence, p. 13, gives example of double hernia passing through a common apert

Tenderness of belly.	Tenderness of rupture.	Contents.	Bowels moved.	Remarks.
				some suspicion of having been affected by the epidemic (cholera) which then raged in Exeter, for there was great blueness of the extremities and lips. The evacuations, however, continued fæcal and moderate. No examination.
Yes, and distended	Yes	Omento-intestinal	Large evacuations on the 22d	Sac was very thin; no fluid; contents, omentum and intestine, smelling badly. Stricture very close, requiring a large opening before the omentum could be returned. Vomiting continued after the operation, until the 21st. On the 22d, *erysipelas*, and the wound had shown no action; 23d, worse, and died at twelve. Examination. Peritoneal inflammation. A knuckle of intestine, dark and strangulated, in the neck of a sac within the abdomen. The ring was largely divided. There was no omentum in this sac. It was supposed that this was a double hernia—that the knuckle of intestine last protruded was first returned, still strangulated by the neck of its own sac, and followed by the return of the omentum.* It is singular that there should have been free evacuations on the 22d.
Yes	Yes	Omento-intestinal	Next day	A person who had been in much better circumstances, and whose constitution was as much broken down as his fortunes. He was eminently bilious. The intestine was dark, but not sphacelated. Relief immediately followed, and free evacuations the next day. The abdominal symptoms did not subside at once, but gradually improved, under free evacuations and good support. On the 3d of

* so *vide* South, p. 4; Chevalier, 'Med.-Chir. Trans.,' vol. iv, Case 2.

No.	Date.	Kind.	Age.	Sex.	Duration.	Strangulation.	Vomiting.	Constipation
6	1855 March 7	Femoral	Middle	F	1 year, not reducible	4 days	Yes	No

enderness of belly.	Tenderness of rupture.	Contents.	Bowels moved.	Remarks.
				April there was *erysipelas of the wound*, which also appeared on the opposite hip. At the end of the third week a little bile appeared in the discharge. On the 22d, the sac sloughed away, and about the same time there was a large discharge of fæces through the wound. May 6th, a complete fæcal fistula. In the early part of June, more than two months after the operation, he sank exhausted. The body was removed.
Yes	No	Omento-intestinal. Intestine with a thin expansion of omentum firmly adhering	No	The operation was deferred for three days after her admission. 1st, from her own conviction that the symptoms did not arise from hernia. 2dly, from the absence of tenderness in the tumour. 3dly, from the undoubted, and rather free, evacuations. A sudden change took place towards the evening of the 7th, and the operation was performed at 10 p.m. The intestine, which was *very dark*, adhered closely to the sac, which was also very thin; and although every care was taken, a small puncture was made. This was immediately surrounded by a ligature. The stricture was freely divided. From the state of the intestine, it was deemed advisable not to return it. For twenty-four hours there was very considerable relief, but no satisfactory evacuation. On the 10th, fæces appeared at the wound. On the 12th, at 11 p.m., she died. Examination, 13th. Small intestines above inflated; reddened. No lymph. Had serum in the abdomen. The intestine in the wound had *sloughed*, and a considerable portion above was of a greenish colour. The intestine below ex-

No.	Date.	Kind.	Age.	Sex.	Duration.	Strangulation.	Vomiting.	Constipat
7	1855 June 17	Femoral	18	F	Old	4 days	Yes	—
8	1858 May 28	Femoral	45	F	Recent	2 days	Yes, stercoracious	Yes

Tenderness of belly.	Tenderness of tumour.	Contents.	Bowels moved.	Remarks.
				tremely contracted. *The iliac fossa and upper part of the thigh in a sloughy state.* The third insertion had been divided to the spine of the pubis. A band of omentum was stretched down from the stomach to the hernial portion of the intestine, to which it strongly adhered.
Little	Great	Intestine	No	It was intended to open the sac. A distinct fascia propria was divided, and another well-defined layer under it; what then presented was doubtful. The preceding case was fresh in our recollection, and, as after a free division of the ring, the protrusion could be returned without any force, this was done. The operation was late in the evening. She was not relieved by it, and died the following day in a state of collapse. The abdomen tympanitic. Examination, June 19th. Intestines highly inflamed, with scarcely any effusion. A knuckle of intestine still bound by the neck of the sac, though not very tightly, as it slipped out during the examination. It laid quite within the cavity of the abdomen. The sac thin, and almost identified in colour with the intestine; no fluid between them. The state almost gangrenous. Canal above distended; below, contracted. Band of adhering omentum dragged to the lower inguinal region, but not within the sac. The ring amply divided.
Not much, a little tumid	Tense, little painful	Intestine.	Began May 22d.	Sac not opened. The hernial sac was soon exposed, and I had no difficulty in passing my finger through

the edge of the stricture, which I freely divided. I felt the obturatrix artery lying under it. I now emptied the sac, by pressure on its contents, but their reduction was not without difficulty. It was effected, however, leaving the sac quite free; not discoloured; rather thick. This I returned, but it came down again empty; it was replaced, when the wound was dressed.

There was considerable febrile action, with flushed face; and frequent, full, and soft

REMARKS—(*continued*).

pulse, and copious perspiration; with tenderness in the inguinal and iliac region; but without any hardness whatever. Leeches were continuously applied here, in small numbers, for two days and nights. Vomiting continued for two days, but gradually ceased, and the bowels began to act at the same time. No purgatives were given by the mouth, except calomel and opium be so considered, but aperient enemata and suppositories were employed. When the bowels began to move the secretions soon became very abundant, dark and fetid, and they were not checked till they began to show an enteritic character. Aromatic confection with opium, was then given with decided benefit.

On the 25th. The neighbourhood of the wound exhibited *dusky erysipelas, which spread.* Simultaneously, an *erysipelas of the same character showed itself at the back of the thigh.* It was a very unfavorable circumstance, that it was necessary, from our operation-wards being full, to remove her at once to her own rather over-crowded ward. The symptoms as regarded the *abdomen,* at the time of her death, which was at six a.m., on the 28th, were favorable, and she was passing healthy stools with yellow bile.

An examination could not be procured.

Large proportion of fatal cases of omento-intestinal hernia.

It will be seen from the foregoing tables, that of the 22 recoveries, 15 were intestinal only; 2 omental only; and 5 omento-intestinal; but of the 14 deaths, 7 were intestinal only; 1 was omental only, and 6 were *omento-intestinal;* so that out of 22 intestinal herniæ, only 7 were fatal; but out of 11 omento-intestinal, 6—a nearly double proportion. For this difference I shall now endeavour to assign reasons. In merely intestinal herniæ, the intestine being replaced, is, saving the changes which strangulation has induced, in a condition to return to its natural state; but when omentum is combined, it often happens that a part of the mass cannot be replaced, or must be cut away; or that the membrane stretched down from above has formed adhesions to the surface of the intestine, impeding its function, at the same time dragging down the stomach. Again, it often forms a dense lump (the result of its long

displacement), which, when pushed into the abdomen presents a surface the very reverse of that which omentum is intended to offer. From the tables given by others, I think the opinion I have now ventured to give will be confirmed, as to the frequent mortality of this form.

It will be observed, also, with reference to another important point which has been more attended to, and on the bearings of which I have also ventured some remarks in an earlier part of this memoir, namely, the restoration of the peristaltic action in its normal direction; that in 20 out of the 22 which recovered, the bowels moved shortly after the operation; and in 2 cases (the 5th and 16th), where the evacuations were late, the symptoms were at first bad. In by far the larger proportion of those who died, evacuations either did not take place at all, or with difficulty, and at a remote period, showing either that a mechanical obstruction still existed from some unrelieved cause, or from changes wrought in the imprisoned bowel prior to the operation; or from peritonitis existing before, or occurring subsequently, for in 3 only were there any speedy evacuations; in 7 there were none, and, in the remaining 4, several days elapsed before any took place, and then shortly before death.

Normal action of the bowels speedily restored in the cases which recovered, and the reverse in those which proved fatal.

I adopted the columns in my tables from those of Mr. South, and, to a considerable extent, they show that I had noticed and recorded the existence of more or less tenderness, either in the rupture itself or in the abdomen,

Not safe to argue on the degree of tenderness of the abdomen or tumour.

but I do not think it would be safe to attempt any conclusion, even if the number of cases were much larger. The state is often uncertain, sometimes contradictory; thus the tumour may have been tender, and the abdomen not, and *vice versâ;* but the main source of difficulty is this: that in several cases the entry was made at the time the cases came under my care, which in those in private was just before the operation; while in the others it was commonly recorded on admission, and not always followed up till the operation was performed, which, although generally very speedy, was not always so, on various accounts; one, but too common, the patient demanding the consent of friends at a distance. Another source of doubt consists in the fact that different people manifest a greater or less degree of pain and apprehension when handled. It is no easy thing to guage this.

Great difference in the value of statistical evidence. Some of a decided character.

Statistics are valuable in proportion as the subject-matter is one capable of being ascertained with more or less certainty. For instance, a hernia being simply intestinal, or omento-intestinal, is a matter of fact, and so is the proportion of deaths in each. Again, the bowels having been moved shortly after the operation, or otherwise, is a matter of fact; so, frequently, correct information can be obtained as to the extent and character of such evacuations. On such points as these we have good right to found an argument.*

* There are other recent and very important contributions to the Statistics of Hernia, *e. g.*, by Mr. Ward, who has given a very valuable report of 100 cases, operated on in the London Hospital. ('Lancet,' June 19th,

With this I conclude the more immediate results of my own practice; but there is a subject which remains, and to which I have before alluded (p. 5), of so much importance that I proceed to offer some comments upon it. If it be objected that I have seen but little of the operation about which I am going to speak, and that it is not fit that I should discuss its merits, I have one answer to give, which will not be without its weight; *i. e.*, that whereas if I argued on facts purely my own they might be liable to challenge, by adopting those of others, which are free from misinterpretation, no such objection can lie; and such are the records to which I have before alluded (published in the 'Medical Times and Gazette'), founded on the practice of a large proportion of the metropolitan hospitals for three years,

The operation by opening the sac compared with that by not opening it.

1856.) The table of Mr. Gay of twenty-two cases, operated on by him, and published so recently as August, 1858, 'Medical Times and Gazette,' is also highly important, as will hereafter appear. Mr. Prescott Hewitt's cases, in the twenty-seventh volume of the Med.-Chir. Transactions,' are especially valuable with reference to the operation by opening the sac, they amount to 34; 9 died, 25 recovered. (This paper also contains four very interesting cases of omentum surrounding and strangling the intestine.) I am also bound to mention Mr. Bryant's valuable analysis of the cases which occurred at Guy's Hospital, ('Reports,' 1856.) No doubt many of the cases included in the above records, constitute a part of those which are given during the three years' statistics in the metropolitan hospitals hereafter quoted, which, as I have elsewhere stated, being of a more comprehensive character, were better calculated for the purpose; but they receive confirmation, rather than otherwise, from the separate reports of the surgeons above given, and also, as it appears, from those of the provincial hospitals since added, but which, as yet, are extended over a much shorter space of time, and where probably Petit's operation has been less generally tried.

and including that of the most earnest and most able supporters of Petit's operation. I subjoin these statistics. They comprise, it will be understood, *all* the cases of strangulated hernia which were operated on at these hospitals during the space of three years. The recoveries are separated in the reports from the deaths, but otherwise they are given indiscriminately. The plan I have pursued has been to arrange separately those in which the sac was, and those in which it was not, opened. I next separated the fatal cases of each. I then carefully analysed the results of the *last* of the three years under both heads.

Arguments chiefly founded on copious and independent statistics of both operations in the 'Medical Times and Gazette.'

Mode of analysis.

The general summary, then, of the first two years is as follows: there were 265 operations; the sac was opened in 179, giving 97 recoveries and 82 deaths; the sac was not opened in 86 cases, giving 55 recoveries and 30 deaths.

In the third year the sac was opened in 87 cases; giving 43 deaths, 42 recoveries, and 2 reported under treatment; the sac was not opened in 39 cases; giving 24 recoveries and 15 deaths. It will be perceived that the rate of deaths to recoveries under the last head considerably exceeds that which occurred to particular surgeons; thus, Mr. Luke lost only 7 out of 59;* but similar differences in success are to be found in the history of all operations; and much depends not only on the skill in the operation, but in the judgment which selects appropriate cases.

* 'Medico-Chir. Trans.,' vol. xxxi, p. 103.

These reports were made quarterly, and I shall take them as they occur, endeavouring to analyse the fatal cases in which the sac was opened, with the view of ascertaining as far as may be possible, whether the deaths were imputable to that mode of operating, or to causes beyond the control of surgery; in short, to ascertain whether, in the cases which died, the deaths may be attributed to the operation, rather than the disease, or to any aggravation of the consequences of the disease by the operation; and if so, whether to a greater extent than when the sac was not opened.

Object to ascertain how far the deaths were due to the particular operation, or to causes beyond the control of the operator.

The first quarter of the last of these three years is reported in the 'Medical Times and Gazette' of October 25th, 1856. The sac was opened in 12 cases, with 4 deaths and 8 recoveries. On examining the causes of death in these 4 cases, it may be stated as regards—

Analysis of the cases in which the sac was opened.

Case 16.—Femoral. The bowel was found adherent to the sac; strangulation five days. Death in twenty-four hours.

Case 18.—Scrotal. Symptoms very acute. When the sac was opened an ulceration was found beneath the stricture. Death from peritonitis in forty-eight hours.

Case 20.—Inguinal. The intestine was found in an almost sloughing state, and afterwards gave way within the abdomen. Death, ten days.

In the last two cases death would in all probability have occurred, whatever operation had been performed.

In the first, Petit's operation might possibly have succeeded better, but it is not very probable.

The second Quarter dates January 30th, 1857.

The sac was opened in 17 cases; recoveries 5, deaths 11; 1 remained under treatment.

From the fatal cases the following are selected with reference to the causes of death.

Case 12.—Femoral. Strangulation fifty hours; condition urgent. Attempt made to return the contents without opening the sac (Luke), omento-intestinal. Intestine returned; omentum adherent, left *in situ*. Death from peritonitis fourth day.

Case 13.—Inguinal. Reduction prior to admission; strangulation remaining; inguinal canal opened but nothing found. Autopsy; intestine within gangrenous; constricted by a band of lymph; peritonitis. Death following day.

Case 14.—Femoral. Attempt made to return without opening the sac (Quain). At the autopsy a coil of intestine was found twisted on itself, and gangrenous.

Case 16.—Femoral. Strangulation four days; autopsy showed the bowel to have given way at the seat of the stricture.

Case 19.—Femoral. Strangulation five days; bowel had given way in two places. Death from peritonitis following morning.

Case 20.—Inguinal. Strangulation ninety hours; symptoms not very urgent; $1\frac{1}{2}$ feet of intestine;

lymph on its surface; sac sloughed. Death ninety-five hours after operation. Bowel found congested, with a thin layer of slough at the seat of the stricture; peritonitis.

Case 22.—Femoral. Strangulation fifty-six hours; when sac opened, bowel found nearly gangrenous. Death next day.

Case 24.—Kind not stated. Death from internal strangulation by a band passing over a portion of the ilium.

Case 25.—Femoral. Woman; bedridden. Attempt to operate without opening the sac (Wordsworth,) failed. All did well as regards the bowel. Death from exhaustion six weeks afterwards. Abscess of the pleura.

Thus, out of 17 deaths, 9 may fairly be accounted for by circumstances which might well have baffled the best surgery, whatever operation had been performed. Indeed, in three, attempts were made to return the contents without opening the sac, and we may be assured did not fail from want of skill. Nos. 12, 14, and 25.

The third Quarter dates May 30th, 1857.

The sac was opened in 28 cases, giving 13 deaths, 14 recoveries, 1 under treatment.

Case 11.—Scrotal. Hernia contained, it is stated, nine feet of intestine. After it had been reduced it was forced down again, and could not be returned. The epigastric wounded but secured. Death in sixteen hours.

Case 19.—*Scrotal.* Operation five hours after strangulation; two feet of intestine down. Death from peritonitis thirty-six hours.

Case 21.—*Inguinal.* Strangulation "many hours." Admitted in a state of collapse, and died in that state three hours after the operation.

Case 22.—*Femoral.* Bowel found gangrenous, and was laid open. Death eight weeks afterwards, from inanition.

Case 23.—*Femoral.* Abdomen in a state of collapse. Died a few hours after the operation. No autopsy.

Case 24.—*Femoral.* Omento-intestinal; adhesions which were separated; intestine black but polished; returned.

Case 28.—*Femoral.* Omento-intestinal. The bowel was found to have given way through nearly its whole circumference, Death soon after. No autopsy.

Case 32.—*Femoral.* Omento-intestinal. Intestine was found healthy. Death on the tenth day from *bronchitis*, to which the patient had been long subject. Autopsy showed the bowel and peritoneum healthy.

Case 33.—*Inguinal.* Congenital. From previous violence in the taxis the sac itself had been ruptured; there was much adherent lymph on the surface of the intestines. Death from peritonitis in thirty hours.

Of the 13 deaths, 9 have been selected as cases where either the death was independent of the hernia, as in No. 32; or where no other operation was likely to have served,

excepting, perhaps, in the first two. Another, No. 30, in which it was intended to open the sac, was the subject of a misadventure, an external layer having been mistaken for it, and the sac was not opened. Death in twenty-four hours. The intestine still strangulated and nearly gangrenous. This case is included in the series of "sac not opened."

The fourth Quarter dates October 10th and 17th, 1857.

The sac was opened in 30 cases; recoveries 15, deaths 15.

Case 12.—*Scrotal.* Omentum in a "cancerous state," and was cut away. Patient died comatose the third day,

Case 15.—Inguinal. Strangulation eleven hours; had *chronic bronchitis.* Death after thirty-nine hours. *No peritonitis.*

Case 20.—*Femoral.* A woman bed-ridden several years; had a large bed-sore at the time; the result of the operation favorable. She died from *bronchitis* and debility *two months* afterwards.

Case 21.—*Femoral.* Had erysipelas and pyæmia. Death *three months* after the operation.

Case 23.—Inguinal. Intestine found nearly gangrenous. Death from peritonitis forty-eight hours.

Case 25.—*Large scrotal.* Child, thirteen months. Death from *convulsions and coma*; autopsy showed the intestine healthy.

Case 26.—*Large scrotal.* About six feet of ilium

down; almost in a *gangrenous state;* strangulation only ten hours, Death from collapse.

Of the 15 deaths in this quarter, 7 are clearly accounted for, and no other operation would have afforded a better chance.

There are 2 more which are given with less precision, but I think they may be considered as additional cases of death not due to the operation of opening the sac, namely—

Case 13.—"Sac opened. The bowel had been reduced without opening the sac, and omentum only was exposed. The omentum was adherent, and the crural ring very tense. Death from peritonitis the second day." I suppose Petit's operation was tried in the first place, and the intestine was returned, but that the omentum remaining the sac was opened. The account is by no means clear.

Case 19.—Femoral. It is stated that it had been strangulated three days. The patient subject to cough; "very ill at the time." Death on the tenth day.

The results of the year may now be briefly stated.

RESULTS.

Sac opened.	Total Number	No. of Deaths.	Probably accounted for.	Doubtfully given or under treat.	Recoveries.	Remain.
1*st Quarter* . .	12	4	3	...	8	1
2*d Quarter* .	17	11	9	1	5	2
3*d Quarter* .	28	13	10	1	14	3
4*th Quarter* .	30	15	7+2	...	15	6
	87	43	29+2	2	42	12

The large proportion of deaths is very startling, amounting to one-half of the cases operated on; but if I have given a tolerably fair solution of the 31 cases which died from causes for the most part beyond the control of art, and in by far the greater number such as would have been unfit for Petit's operation, it will leave only 12 for fair comparison.

This analysis shows that a very large proportion were unavoidable deaths.

This is not the first attempt that has been made to ascertain the causes of death after the operation, for in Mr. Lawrence's valuable work will be found a very able statement on the subject, more recently also by others;* but, in the present instance, the materials have been supplied from *various* independent and unbiassed sources, and they are both ample in number and sufficiently comprehensive. I may further observe with respect to the principal object of this inquiry, that no one of the distinguished surgeons alluded to, has expressed any opinion adverse to the *alleged analogy* between Petit's operation and that by the taxis, which is one principal object of this inquiry, but rather the contrary. As regards the cases now cited, it will be found that peritonitis existed in a large proportion. In a great many of these it was clearly traceable to the changes produced in the protruded contents from inflammation, gangrene, nipping of the bowel by the stricture, adhesions preventing the return, or separated forcibly. Also from causes within the abdomen, such as bands, or twisting of the bowel; but

Various causes of death independent of any operation. Common to both.

* I may particularly mention Mr. Bryant's 'Analysis of the Fatal Cases in Guy's Hospital.'

besides these we find erysipelas, gangrene of external parts, pyæmia, inflammatory affections of the chest, failure of constitutional power, inability to bear the shock of an operation or of the disease, bed-sores, &c.,—circumstances quite independent of the operation, and, as will be seen hereafter, common to the operation without opening the sac.*

* Since this was written, the paper of Mr. Gay (to which I before alluded) was published in the 'Med. Times and Gazette,' August 14th, 1858. It contains a table which singularly confirms the foregoing views. It describes 22 cases, operated on by Mr. Gay himself: 11 of these had the sac opened, 7 died, 4 recovered; 11 had not the sac opened, 4 died, 7 recovered (a sufficient proportion, I submit, if others were wanting, to set aside any analogy with the taxis); but the remarkable circumstance is, that of the 7 who died where the sac was opened, death may, I think, be fairly accounted for, as in the cases I have previously quoted, independently of any influence from the operation. The following is a brief abstract:

"No. 3. Strangulation had existed twelve days; the contents highly inflamed.

„ 4. Strangulation had existed ten days. Intestine dark, not gangrenous 'evidently unfavorable.'

„ 5. Omentum gangrenous. A knuckle of intestine nearly cut through by the stricture.

„ 6. In a state of collapse. Death in three hours.

„ 12. Omentum and a knuckle of gangrenous intestine in the sac.

„ 17. Died suddenly from disease of the heart, while otherwise progressing favorably.

„ 19. Hernia protruded by a severe blow, which appears also to have occasioned large hæmorrhage into the abdomen."

I may add the important contribution by Mr. Ward, who gives the result of 100 operations performed in the London Hospital by different surgeons, as follows: out of 63 cases of femoral hernia, the sac was not opened in 42, of these 10 died. Of 21, where it was opened, 9 died; but the ages of the patients, and the periods of strangulation, appear to have been much less favorable than in the former; the same probabilities, therefore, attach to them as to the others I have quoted.

There can be little doubt that the majority of these fatal cases were the victims of *time;* that many of them might have been relieved by the taxis at a sufficiently early period; and that either Petit's or the operation by opening the sac (the taxis failing) would have saved them if time had not run on; this I am aware is an error little imputable to the distinguished surgeons by whom these operations were performed. It is generally the unfortunate patient who is the cause of his own disaster.

I have expressed my belief that in three or four of these cases Petit's operation might have savêd life; but, on the other hand, it is not improbable that of the 42 recoveries, all might not have occurred if the sac had not been opened; of course this is matter of conjecture.

Record of cases when the sac was not opened.

I now proceed to examine the same records of those operations in which the sac was not opened, which for brevity's sake may be called Petit's, although much and very advantageously modified since his time by Key, Luke, Solly, Hancock, Gay, and other able surgeons.

The first two years give 86 cases; *i. e.*, 55 recoveries, 31 deaths.

The third year gives 39 cases; *i. e.*, 24 recoveries, 15 deaths. Total number in three years—126 cases, and 46 deaths.

Sac not being opened, the state of the contents at the

In the first series, where the sac *was* opened, as the state of the parts was shown by that proceeding, a selection could be made of such cases as gave presumptive proof of their

time of the operation unknown and cannot be stated.

being decidedly unfavorable or otherwise at the time of the operation; in this series no such means were offered, from the very fact of the sac not having been opened. I therefore give the whole without selection, and any conclusions which can be drawn must be deduced from autopsies when made, or from the narrative when not made.

Analysis.

First Quarter.—Case 19.—Femoral. Died with *pleuro-pneumonia*, but as the symptoms are not detailed, and there was no autopsy, there is nothing certain as to the abdomen. Death on the ninth day.

Case 22.—Femoral. Death on the sixth day. Autopsy showed perforation of the bowel at the seat of stricture.

Case 23.—Femoral. Death from peritonitis third day.

Case 21.—Scrotal. Must I think be added to this list, for it is stated that an opening was made into the abdomen, *not through the ring.* At the autopsy it was found that the strangulation was not relieved. There were 7 recoveries.

Second Quarter.—Case 15.—Femoral. Condition favorable, peritonitis following day. Death on the third day.

Case 17.—Femoral. Death from peritonitis on the third day.

Case 21.—Femoral. Death on the second day, imputed chiefly to extensive hæmorrhage from an artery

supposed to have been the obturatrix. Autopsy imperfect. There were 5 recoveries.

Third Quarter.—CASE 25.—Femoral. Strangulation fifteen hours. Peritonitis at the time of the operation. Death from peritonitis ten days afterwards.

CASE 26.—Femoral. Strangulation fifteen hours. Peritonitis at the time of the operation. Death eleven days afterwards. There was cellular inflammation about the wound; not stated whether there was an autopsy.

CASE 30.—"It was intended to open the sac, but an external layer having been mistaken for it, this was not done. Hernia returned; and at the autopsy bowel found strangulated and nearly gangrenous." There were 2 recoveries.

Fourth Quarter.—CASE 17.—Femoral. Strangulation four days. Death from peritonitis.

CASE 18.—Femoral. Death from peritonitis fifth day.

CASE 27.—Femoral. Strangulation ten days. Death from peritonitis.

CASE 28.—Scrotal. Strangulation twelve hours. Death from peritonitis the same day.

CASE 14.—Femoral. In this case it is most probable that it was intended to open the sac, which was not, however effected. It is stated "that a considerable mass of fat was cut away, under the belief that it was omentum," (an appearance very capable, I may add, of deceiving a

good surgeon). The account, however, is not very clear. "At the autopsy, the sac was found empty and unopened. It was surrounded by enlarged glands and lobulated fat much resembling omentum." There were 10 recoveries.

The result then is, that out of 39 cases in which the sac was not opened there were 15 deaths; of these, no doubt, there were several in which circumstances beyond control produced the fatal termination, as well as in the first series, where the sac was opened; but what the proportion may have been it is not equally possible to judge, inasmuch as the state of the contained parts was not seen when the operation was performed, either in those who recovered or in those who died.

These facts show that the analogy between the taxis and Petit's operation fails.

We may now return to the supposed analogy between Petit's operation and the Taxis, on which its advocates chiefly base its supposed advantages. (Its advantages in appropriate cases I by no means deny.) The preceding statement justifies me in affirming *that there is no true analogy between them. Death hardly ever occurs after a successful taxis.* There is another fact, sufficiently worthy of notice. When hernia has been reduced by the taxis, recovery is generally immediate. When by Petit's operation it is much otherwise. Mr. Ward says the shortest period in which a case of unopened sac had recovered was *the tenth day.* I avail myself of this information in comparing this with the taxis. The inevitable conclusion is, that there are cir-

cumstances involved in Petit's operation which cause the difference in the result, and these demand inquiry.

A reference to the fatal cases in the second series will show that the immediate causes of death in both operations are precisely the same, chiefly peritonitis; also inflammation of the lungs, especially bronchitis, erysipelas, gangrene of external parts, pyæmia, &c.; the next point is as to the relative numbers. How does the matter stand with reference to Petit's and the old operation? If the analysis of the fatal cases after the latter be in the main allowed to be just, by subtracting the unavoidable deaths it reduces the number to twelve out of eighty-seven (p. 76), in which the operation itself, may (or may *not*) have contributed essentially to the result. On the other hand, we find that fifteen out of thirty-nine operations where the sac was not opened died, and making every allowance for cases of unavoidable death, as in the former series (but which, the sac not being opened, could not be justly ascertained), the difference may be deemed not very great. Furthermore, it must be considered, that Petit's operation is only performed in selected cases, and generally at an earlier period,* and when the sac also is opened at an early period, the

Causes of death the same as when the sac is opened.

The question would be as to the relative proportions supposing all circumstances the same.

* Mr. Ward states, that in the forty-two cases of femoral hernia, in which the sac was unopened, the period during which the strangulation had lasted prior to the operation was less by twenty hours than in the cases where the sac was opened. He thinks, that if an equal number of cases precisely similar as to duration and other circumstances, were operated on by surgeons of the same skill, there would be no difference in the results. This may be doubted.

amount of success is comparatively great.* When these matters are duly estimated, the relative merits of the two may be better appreciated—of this presently; but it will, I think, be conceded, that the results in every case, whether accomplished by the taxis, by Petit's operation, or the old one, depend mainly on the conditions existing prior to the operations. A few observations on these may now be permitted. We ask the question, what constitutes the difference which in certain cases allows a hernia to be reduced without division of the ring, *i. e.*, by the taxis, and in others does not? Again, what is the cause of those cases so often terminating fatally when it has been necessary to divide the ring, albeit the sac is not opened?

What conditions allow the taxis to succeed. What Petit's operation, and, finally, what require the sac to be opened.

The period within which a hernia is reducible varies much according to the degree of strangulation, which depends upon the tightness of the stricture, and the changes in the bowel; I believe that while the latter remains smooth and polished, not grooved or nipped, not thickened materially by congestion, it may be returned, and so much the more readily as these changes have less advanced,† and *when returned, the state of the bowel speedily becomes normal within the abdomen.* This is the period available for the taxis. When the converse

* Mr. Luke states that of 60 cases, operated on within forty-eight hours, 12 died; whilst of 38, after more than forty-eight hours, 15 died.

† Mr. Gay attributes the difficulty of reduction in a great degree to the angular or twisted position of the bowel in a hernia. That such changes may occur, and act unfavorably in some cases, I have no doubt, but neither in my own, nor in the much larger number I have seen under other surgeons, have I been aware of this state existing.

is the case, when the bowel at the ring is no longer smooth, but nipped and grooved, and its tissues congested, when also, if I am right in my conjecture, a greater degree of active constriction has taken place in the ring, a division is necessary to return the contents and whether that division is made external to the sac, or otherwise, *by this time, such changes have taken place in the bowel as render it but too capable, when replaced in the abdomen, of increasing any peritonitis which may have commenced, or of exciting it, if not;* and hence the number of cases of fatal peritonitis, after Petit's operation as well as the old. If the causes of the different results of the taxis and Petit's operation are thus explained; it will further free the operation of opening the sac, from much of the suspicion which has attached to it. The two grounds of objection to that procedure, are, on the one hand, the opening of the peritoneal sac, on the other the exposure to the air, and handling the contents. The former I believe to have been much exaggerated; and I quite agree with Mr. Le Gros Clark * that the sac of a hernia, although a part of the peritoneum, is generally so altered in its pathological condition, as to be very differently affected by a wound than the peritoneum proper and unchanged. The latter cannot be denied, and is the very essence of any valid objection; but on the other hand, there are advantages often arising from opening the sac, which must be taken in its favour; and after all it becomes a balance between the two, a balance, however, which can only be deduced

Brief estimate of the advantages and disadvantages of both.

* 'The Lancet,' March 3, 1855.

from a fair estimate of both, and applied to each case which may present itself.

Where Petit's operation is applicable to be performed.

It must not be supposed that I have argued this question with any prejudice against Petit's operation, I only think that its true bearings have not been sufficiently considered. I should undoubtedly prefer it when the ring can be divided with facility, and where there is no reason to suppose such a state of the contents as to require examination; but when the statements now made are duly considered, I do not think there will be found any inherent difference in the two operations so intrinsically great, as to lead us to prefer Petit's, where these conditions do not recommend it, and, indeed, his own advocacy can hardly be considered to go further than this.

The following case, to which I have alluded in the early part of this memoir, interesting in many respects, I give more in detail.

March 12th, 1845.—I was sent for, to the wife of the coachman of a gentleman, who resided about fifteen miles from Exeter, where I met three of my medical friends in consultation. She had given birth to a child ten days before, and was then supposed to be labouring under strangulated umbilical hernia.

Chiefly above, but extending a little below the umbilicus, and rather to the right side, was a large tumour, having no well-defined edge, and under which the fingers could not be passed, but it was evident, from percussion, that intestine was beneath. On steady pres-

sure it appeared to recede, but slowly would return when that pressure was removed. It was tender, but not much so. She had pain in the abdomen, looked distressed, vomited intestinal secretions, and had obstinate constipation. The tongue furred and bilious. Pulse nearly 100, and active. The *umbilical ring could be felt.* The symptoms had continued four days. It was stated, that she had rather improved since the morning. My advice was, that in such a doubtful case, an operation should be deferred, and it was arranged that I should see her on the following day.

On the 13th, I saw her again with the same consultants, and there having been no improvement, an operation was determined on, (a doubt still strongly existing in my mind as to its being an hernia), and it was also determined to make it in the following way. which would involve no serious consequences, if a hernia did not exist:

I made an incision of about three inches and a half in the line of the linea alba down to and a little below the umbilicus, this showed nothing but the linea alba. I cautiously divided that, and came to the peritoneum of a natural appearance, and not tense. Here I stopped, being myself satisfied; but after an anxious consultation, by the desire of my consultants, I divided the linea alba for a further space of about two inches downwards, underneath which was peritoneum still of a perfectly natural colour. Not having opened the cavity of the abdomen, there was now nothing but a wound of common parts; this I closed.

On the 17th, I was informed that the symptoms were

yielding to the use of injections thrown up by the long tube. She subsequently recovered.

This no doubt was one of those cases, not of internal strangulation, for there most probably would have been no recovery; but of internal inflammation similar to those recorded by Mr. Pott, but accompauied with a tumefaction near the umbilicus, so peculiar as to justify the apprehension that it was hernia.

I shall now conclude by briefly stating the principal points which it has been the object of this memoir to bring before the notice of the profession; and first, I shall endeavour, notwithstanding the repetition it involves, to set forth those which are of general application, as regards all herniæ. Which equally concern the taxis; the operation without, and that by opening the sac, and which tend to illustrate the symptoms which more or less take place in each. In this part, there are few statements which do not find support in previous authority; the conclusions to a considerable extent may be considered more peculiarly my own, and as such, must be received with allowance and with caution. They are chiefly a summary of what has been stated pp. 35 to 37, and 82 to 86, and are as follows:

That the taxis commonly succeeds soon after strangulation, but with increasing difficulty as time goes on, is

a received fact. It succeeds, probably, before the changes which have been made by the stricture have made much progress, *i. e.*, before the bowel has been long and strongly nipped; before the tissues of the bowel itself have been much thickened by congestion; and it may be, before the return is further impeded by the active constriction of the ring itself; all causes mechanically preventing it, and as these changes operate more and more, so the return of the contents becomes more and more difficult, and *after a time impossible.* In this statement may also be found an explanation of the very natural question, *why patients rarely die when the taxis succeeds;* in fact, the taxis *can* only succeed, when these changes have not proceeded so far as to originate, or maintain (if already existing), any serious amount of mischief within the cavity. The taxis succeeding, and the contents replaced, everything speedily resumes the natural course. This may be termed the First Period.

When these changes have gone so far as mechanically to prevent the return of the hernia by the taxis, they have also gone so far as to produce a more grave and lasting mischief. The return of the contents can now only be obtained by the division of the stricture, but when this is effected, peritonitis, in a greater or less degree, having for the most part already commenced, or, being subsequently induced by the advanced stage of mischief in the returned bowel, those results very commonly follow, which occur, though not equally, after both operations by incision, and often to a fatal extent. Between the time when the taxis has ceased to be

practicable, and that when, to return the contents, an opening of the sac is necessary, an interval intervenes, when Petit's operation *is* practicable, other circumstances not forbidding it, and this may be considered the Second Period; but as regards any true analogy between that operation and the taxis, the opinion is, as it appears to me, wholly fallacious; it goes no further than the mechanical advantage of returning the hernia without opening the sac. All other circumstances are now different.

When these changes have further advanced. When adhesions have formed, or other causes prevent the sac from being emptied of its contents, or relieved *in situ* by Petit's operation if not emptied, the simple division of the stricture will not suffice. The sac must be opened. This is the Third Period, and it will not be wondered at, that death more frequently occurs, because the graver the changes, the greater the danger from collapse, peritonitis, gangrene, &c. &c. These changes often extend to the utter disorganization of the bowel.

Two important questions connected with these operations remain:

1st. To what extent are the manipulations in attempting the taxis prejudicial or otherwise? Before the First Period is over, generally highly beneficial if prudently conducted; after it, often more or less injurious. The difficulty is in determining when that period is past. This can only be deduced from want of success in the attempt in most instances: nevertheless, the conse-

quences so commonly imputed to the taxis, are much more frequently the result of the changes which have been advancing in the contents of abdomen during an unnecessary delay.

2d. To what extent do the two operations by incision prove prejudicial *per se?* The wound in Petit's operation can rarely do so, excepting so far as it may give rise to erysipelatous inflammation. The old operation has been subjected to reproaches it does not deserve; but still, by exposing the contents to the air, by the handling the unprotected bowels, and in many cases by establishing a communication between a wound digesting badly and the cavity of the abdomen, it induces risks which often cannot be avoided; the danger, however, in both operations, does not arise from such causes in any proportionate degree to that from the previous changes in the viscera concerned.

A difference of opinion exists with reference to the effects of the incision in the sac. It is probable, that in quite recent herniæ, the state of the membrane being unchanged, it may be a source of evil; but in old herniæ, its constitution is so altered as to render any injurious results very doubtful.

The attempt now made to explain the conditions which govern the different stages of strangulated hernia, and their bearings on the three operations, may be accepted or otherwise; but this good will at all events result from it, that if not satisfactory, it may induce others to redeem them from the doubt, the obscurity, and con-

trariety of opinion at present prevailing. There are some other points which I have commented upon in this memoir, which also may be deserving a brief recapitulation.

1st. That omento-intestinal herniæ are more fatal than any other class. The reasons for this are submitted (p. 66).

2d. That as regards the stricture or strictures analogies with other phenomena, especially those which are observed in paraphymosis, offer grounds for supposing an active constricting power (p. 29).

3d. That the peritonitis originating from the strangulation in hernia, differs in type from idiopathic; that its symptoms are materially modified by the sympathetic influence of the strangulated portion, and that its being so often "*latent*" is owing to the processes of inflammation being *kept in abeyance* by that influence, especially while the constriction is not freed (p. 34—37).

4th. That the intestine above the stricture, dilated as it always is, may not unfrequently be the seat of injury, if a wound is inflicted on the bowel in the operation (p. 27).

5th. That the chronic character attributed to the strangulation when occurring in old people, rests upon very doubtful evidence, for hernia being incident to that portion of existence in a very great proportion of cases,

and consequently strangulation also, and while the larger number of fatal cases on record are of an acute character, it is a fair conclusion, that even in the old, such is the predominant condition (pp. 8, 9, &c.).

6th. That in addition to the general indications offered by the *fluid*, there may be these further conclusions afforded by it, as determined by the *degree* of constriction: namely, that when the fluid can be pressed into the abdomen, the degree is not extreme, and *vice versâ;* and again, where no fluid is found in the sac it affords a probable indication of the degree of stricture being extreme. Furthermore, when in such cases a gush takes place from the abdomen, on the division of the stricture, it shows much congestion or inflammation there (p. 23).*

7th. That inguinal hernia in the female, although sufficiently common, is rarely strangulated (p. 9).

8th. That in very large femoral hernia in the female, it is sometimes impossible to make out Poupart's ligament; and in these, the diagnosis may be founded on a different principle (p. 10).

To this I may further add, that the important ques-

* Since this part of the memoir went to the press, I had occasion to look over again the earlier volumes of the 'Medico-Chirurgical Transactions,' and I found that a surgeon whose merits have hardly been appreciated as they deserve, Mr. Chevalier, had made very similar remarks on the indications offered by the fluid. They have, however, been but little regarded.

tion of the action of purgatives, as connected with the pathological condition of the alimentary canal after the reduction of hernia, has been considered; more, however, with the view of exonerating them from undue prejudice, than with the intention of recommending their use, otherwise than by injections (p. 32). The frequent occurrence and fatal complication of erysipelas of a bad type, and its causes, have also been adverted to (p. 38), and in dealing with the question of the large mortality of these operations in rural districts, I have endeavoured to explain the cause by reference to the distances which operate adversely in many very intelligible ways (p. 30).*

"Time and chance happen to all men;" but in very different proportions. To the members of my own profession the latter is abundantly the case; but as regards the former, it must be confessed that it is in an inverse ratio, and especially to that class who have most frequently to grapple with the difficulties and great responsibilities which involve the practice in strangulated hernia. Leisure is so scanty, that they can ill spare the time for reading any useless or superfluous matter. So

* In speaking of the operation, I have alluded (p. 17) to the difficulty often experienced in returning the intestines into the abdomen, from the inflated condition of the viscera within; from the tension of the muscles; and the struggling of the patient; and have mentioned Dr. Buchanan's having proposed a plan to meet this, a plan, however, which so much depends upon the control the patient can exert over himself as to make it often difficult. I have, however, omitted to speak of another method which I have sometimes tried with much success. It is simply to turn the patient on the opposite side. It converts enemies into friends—for the bowels within no longer resist the ingress of those protruded, but rather draw them back.

deeply impressed am I with the paramount importance of this being a maxim to be attended to by every one who ventures to publish, that I have endeavoured to make this memoir as brief as I possibly could, consistently with the importance of the subject. It too oftens happens that Horace's warning applies in such cases, but it is possible to reverse it. The public will always look with a favorable eye on the attempt, to be brief without obscurity.

J. E. ADLARD, PRINTER, BARTHOLOMEW CLOSE.