neck of the sac is unnecessary in children, but I have always done so in adults to prevent the possibility of any semblance of pouching at the internal ring.

If it be granted that oblique inguinal hernia in adults is primarily due to a preformed sac, then, from the clinical evidence we have in children, the operation which will deal with the sac with the least damage to the canal is what we must aim at. The operation I have suggested appears to me to carry out the above requirements in the simplest manner possible. Murray⁷ says, "Clearness of purpose and simplicity of method should be our aim." I think you will admit the simplicity of method. I can only hope that I have succeeded in making my purpose clear.

REFERENCES.

- ¹ H. M. Rigby, *Practitioner*, August, 1907. ² H. J. Stiles, *BRITISH MEDICAL JOURNAL*, October 1st, 1904. ³ R. Hamilton Russell, *Lancet*, November 3rd, 1906 (references to previous papers given in the above). ⁴ R. W. Murray, *BRITISH MEDICAL JOURNAL*, June 16th, 1906; *Liverpool Med. Chir. Journ.*, July, 1906. ⁵ William T. Bull and William B. Coley, *Journ. Amer. Med. Assoc.*, September 21st, 1907. ⁶ H. S. Clogg, *Practitioner*, September, 1907. ⁷ A. Keith, *Lancet*, November 17th, 1906. ⁸ C. B. Lockwood, *The Radical Cure of Hernia, Hydrocele, and Varicocele*, 1898, pp. 12, 270. ⁹ John Langton, *The Bradshaw Lecture*, 1900, p. 42. ¹⁰ J. W. Seaver, *Yale Med. Journ.*, February, 1904, p. 277. ¹¹ A. E. Barker, *Surgical Operations*, 1887, p. 334. ¹² Charles MacLaren, *Australasian Med. Gaz.*, September 20th, 1900. ¹³ E. F. Neave, *Indian Med. Gaz.*, May, 1901. ¹⁴ Th. Kocher, *Textbook of Operative Surgery*, translated by H. J. Stiles, 4th German edition, p. 244. ¹⁵ William H. Bennett, *Clinical Lectures on Abdominal Hernia*, 1893. ¹⁶ Lucas-Championnière, *Cure Radicale des Hernies*, 1892, pp. 193 to 196.

THE MORBID ANATOMY AND PATHOLOGY OF INFANTILE AND ENCYSTED HERNIA.

WITH A NOTE ON ACCIDENT OF TAXIS.

By R. HAMILTON RUSSELL, F.R.C.S.ENG.,

SURGEON TO THE ALFRED HOSPITAL, MELBOURNE; CONSULTING SURGEON TO THE MELBOURNE HOSPITAL FOR SICK CHILDREN.

In this paper I purpose setting forth a view as to the morbid anatomy and pathology of infantile hernia, which in important respects is at variance with that which surgeons have come to regard as firmly established, and which is associated with the name of its author, Mr. Lockwood. Needless to say, this is not an undertaking that I should enter upon lightly nor without the pressure of very strong conviction; and if I should succeed in throwing an additional ray of light upon what is admittedly a very obscure subject, Mr. Lockwood, who probably realizes its obscurity better than anybody else, will be the first to recognize whatever is well founded in my reasoning. My experience of infantile hernia is limited to two cases that I have met with on the operation table.

CASE I.

A man aged 33; Alfred Hospital, May, 1902. Left inguinal hernia. The initial incision in the groin laid open a serous bag, which was found to be continuous with the tunica vaginalis testis. The posterior wall of the bag was incised to expose the structures of the cord and the hernial sac. The sac was separated from the cord up into the abdomen in the usual way after incision of the external oblique. The operation differed in no way from that which I habitually perform, except that both layers of the front bag were incised before the cord and hernial sac were reached, and that the incision of the external oblique necessarily involved incision also of the upper part of the front bag, which was thus virtually disregarded. The operation consisted in simple removal of the sac, after free exposure of the canal by means of incision of the external oblique.

CASE II.

A man aged 30; Alfred Hospital, November, 1906. In this case the hernia was right-sided, and the hernial sac bulged more markedly into the front bag when this was opened. In other respects the operation was identical with Case I.

Infantile hernia is a variety of inguinal hernia that has had a somewhat eventful history. It was first described by Hey, of Leeds, in 1764, and the pathology of it was the subject of the wildest and most erroneous theoretical speculation, until Lockwood in 1886 very carefully reviewed the subject by the light of much thought and no inconsiderable amount of research, and published his views in a paper entitled, *The Morbid Anatomy and Pathology of Encysted and Infantile Hernia*.¹ I shall offer no apology for commencing with a brief elementary description of the anatomy of infantile and encysted hernia, in order to show the great value of Mr. Lockwood's contribution to our knowledge of this subject, and

to make clear the relationship of infantile and encysted hernia, which he was the first to demonstrate.

The anatomy of these two forms of hernia is simply shown in the diagrams A, B, C, Fig. 1. The essential arrangement of the serous membranes is that of a hernial sac, which lies behind a long prolongation upwards from the tunica vaginalis; in B the sac is represented as bulging more markedly into the cavity of the serous membrane in front of it, with a slight tendency for its lower end to become enveloped, while in C the bulging and enveloping has been pushed to an exaggerated degree, so that the sac not only bulges into the front bag of serous membrane, but is actually enveloped by it to a large extent. Thus it is evident that C is merely a variant of the anatomical peculiarity that is displayed by A and B. A represents a typical case of infantile hernia, C encysted hernia. I have never seen a case of encysted hernia, and I doubt if it has even been seen in the exaggerated degree in which I have depicted it. In operating upon a case of infantile hernia, A, the surgeon will necessarily cut through three layers of serous membrane before the herniated bowel is exposed, namely, the front and back layers of the anterior bag, and the front wall of the hernial sac. In operating upon a case of encysted hernia, like C, on the other hand, after having opened the front layer of serous membrane, he will find what appears to be a hernial sac,

Fig. 1.

pendent and loose in the cavity. He will, of course, have to cut through just the same number of layers of serous membrane to reach the bowel as in operating upon A, but the naked-eye appearances will obviously be quite different; so different, indeed, that until Mr. Lockwood elucidated the subject, C was classed as a separate class of hernia under the title "encysted."

I have said that the wildest theories were indulged in to explain the occurrence of encysted hernia, and all presupposed the view, which we now, many of us, believe to be completely mistaken, that the typical mode of causation of hernia is that of becoming "acquired"; which means that sac and hernia together are pushed out through the inguinal canal by intra-abdominal pressure overcoming a weakened abdominal wall. Without going into further detail, suffice it to say that Mr. Lockwood made short work of all such theories by showing clearly that the sac is a congenital structure, and undoubtedly is developmentally associated with the descent of the testis. Furthermore, as the result of most careful research, he concluded that the sac is an abnormal structure that owes its origin to the tractive power of the gubernaculum testis. I may, perhaps, reproduce in his own words the conclusions at which he arrived as the result of his research; they were:

- That the London museums contain no specimen of encysted hernia such as is usually described.
- That the various specimens designated by that name belong to the infantile variety.
- That the latter owe their origin to the tractive power of the gubernaculum testis.

There the matter has remained. Mr. Lockwood's views gained immediate acceptance, and it was right that they should, for assuredly no investigator has either before or since studied the subject with such laborious care. My own opportunities for studying the matter have been limited to the two cases that I have described. Yet this

scanty experience has thrown a flood of light upon the subject that emboldens me to reopen the question as to whether Mr. Lockwood's view of the etiology of infantile hernia is not susceptible of amendment in certain of its details. My two cases were identical in character and anatomical arrangement; they were, I think, undoubtedly of the nature of infantile hernia, and yet for reasons I shall point out, they certainly did not originate in the way described by Mr. Lockwood. This fact has opened up some very interesting considerations. I shall have to suggest that a curious mistake has been made as to the nature of the various parts concerned in infantile hernia. Turning to Fig. 1, A, I would specially fix attention on the two chief structures there displayed, the sac *s* and the long process extending upward from the tunica vaginalis, which has been regarded as the funicular process, but which I will call for the present *x* (because I am convinced that it is not the funicular process). Mr. Lockwood's view is that *x* is the funicular process closed only at one point high up near the internal ring, leaving the remainder of the funicular process and tunica vaginalis open; the hernial sac he takes to be an abnormal structure pulled down by action of the gubernaculum testis, which is still to be recognized connecting the sac with the testis. The view I am putting forward is that the sac is a perfectly normal funicular sac, that the connecting bond between the sac and the testis is presumably the usual one resulting from obliteration of that portion of the funicular process; and, finally, that there is only one abnormality in the whole arrangement—namely, the long prolongation *x*, which is the result of a developmental accident to the tunica vaginalis.

My argument will be divided into three sections, which will briefly deal with—

- The *a priori* improbability in Mr. Lockwood's explanation.
- The evidence afforded by my own two cases.
- The relationship between infantile hernia and other well-recognized forms of hernia which the new view establishes.

A. The *A Priori* Improbability in Mr. Lockwood's View.

It is curious that this does not appear to have attracted notice. The theory presupposes the occurrence of two distinct developmental happenings: (1) The closure of the funicular process at its upper part only, and (2) the appearance in the canal of an abnormal sac. When, however, we look for the relationship between these two occurrences, and ask ourselves why they should appear coincidentally in this way, the answer does not appear to be very evident. It is perfectly true that the funicular process may be obliterated at one spot only, leaving a very large tunica vaginalis, but this arrangement has been in my experience excessively rare. It is also perhaps true that a sac altogether independent of the funicular process may appear in the inguinal canal, but such an occurrence is probably still more rare than the other, for I do not think I have ever seen such a case. Now, if these two abnormalities do occur simultaneously it is absolutely inevitable that there should be some causal relationship between the two; their association cannot by any stretch of imagination be accepted as a mere coincidence. On the latter assumption, their concurrence in even a solitary case would be a coincidence of a most extraordinary nature; but for us to suppose that they should habitually coincide with such regularity as to constitute a recognized variety of hernia is obviously out of the question. And yet I am unable to find the slightest shadow of a causal relationship whatever between the two. When we once begin to analyse the matter in this way we shall, if I mistake not, have it suddenly borne in upon us that there must be something wrong, some source of error in Mr. Lockwood's explanation that does not appear at the first blush, but which ought to be revealed on closer examination.

B. The Evidence Afforded by my Two Cases.

I have already given a sufficiently detailed description of these two herniae, which were practically identical in character. Both were met with in young men operated on at the Alfred Hospital in May, 1902, and November, 1906; they were respectively left and right sided. In both the anterior serous bag (tunica vaginalis and its prolongation upwards) was opened straightway by the initial incision in the groin; in both the hernial sac was exposed by incision of the posterior wall of the tunica vaginalis; in both the hernial sac presented the appearance of an ordinary funicular sac, having a perfectly normal relation

with the structures of the cord; and in both the process of separation and removal of the sac after its exposure differed in no way from that ordinarily practised. The fact that the upward prolongation of the tunica vaginalis (the process *x*) was not the funicular process is proved in two ways. In the first place, it is rendered certain by the position of the upper extremity, which was outside the external ring, on the surface of the external oblique; and, secondly, by the fact that it was opened immediately by the initial incision, thus proving that it could not have been inside the coverings of the cord. Either of these two characteristics would alone suffice to render it certain that the process was not the funicular process. What, then, was it, and how was it formed? In the operation on my first case, the etiology of this condition seemed to be perfectly obvious; the testicular portion of the processus vaginalis had been caught and anchored to the abdominal wall, just outside the external ring, and the subsequent descent of the testis had caused it to be drawn out into the long process, which thus simulated the funicular process. In a published address on the subject of hernia¹ this case is described and illustrated by two diagrams, showing what I conceive to be the pathological basis of the condition.

Fig. 2.—In A the funicular process is shown in its original state; B shows the result of obliteration of the lower portion: *f. p.* = funicular process; *s* = sac; *o. f. p.* = obliterated portion of funicular process.

These diagrams I reproduce here. (Fig. 2, A and B.) It will be seen that the formation of the sac and the obliteration of a portion of the funicular process has taken place in a way that is very frequent, and that there is only one unusual occurrence that has imparted the peculiarity to the hernia, and this is the anchoring of a part of the tunica vaginalis to the abdominal wall. As I have expressed it elsewhere, a developmental accident has resulted in the serous membrane being "caught" or "hung up," and this is the sole cause of the singular arrangement that is presented.

Now I am aware that the specimens in the London museums that Mr. Lockwood has examined so carefully may not present anatomically identical characters with my two cases. No mention is made by Mr. Lockwood of the precise situation of the upper extremity of the process *x* in relation to the abdominal wall. I can quite conceive that in a museum specimen this point might perhaps not be clearly shown, and unless the explanation that I am suggesting had chanced to present itself to the mind of the observer, the importance of the point would probably escape notice. I am going to assume, however, what I am certain must be the case, that the upper extremity of the process *x* will sometimes be found inside the inguinal canal—in such a situation, therefore, that it will be found impossible to tell that it is not the funicular process. My reasons for believing that such an arrangement will be occasionally found will be best understood after consideration of the third section of my argument.

C. The Relationship between Infantile Hernia and Other Well-recognized Forms of Hernia which the New View Establishes.

Sacculation of the funicular process is a matter of frequent occurrence, and it is undoubtedly the result of what is apparently a developmental accident, the serous

membrane being caught up or anchored by the abdominal wall in the process of development, so that a sacculus is formed. When the sacculus lies between the peritoneum and the abdominal wall, a hernia passing into it will be a properitoneal hernia; when the sacculus lies between the layers of muscle in the abdominal wall, an interstitial hernia will be presented; when the sacculus lies superficial to the abdominal wall, still another variety of hernia, recently named "hernia inguino-superficialis," will result; this last form is probably the most frequent of all. All these varieties of hernia are frequently, but by no means necessarily, associated with imperfect descent of the testis. Now, it will be evident at once that the view I am putting forward with reference to my two cases is that they are really variants of the last variety of hernia. As in the case of hernia inguino-superficialis, the processus vaginalis has been anchored outside the external ring, but superficial to the external oblique aponeurosis. In operating upon cases of imperfectly descended testis in which the testis is retained close to the external ring, it is a matter of frequent observation to find the processus vaginalis spreading outwards in the form of a sacculus on the surface of the external oblique aponeurosis. It is clear that its presence in this situation is the result of a developmental accident, and that the non-descent of the testis is closely associated with it.

Both testis and serous membrane have been caught and fixed in their abnormal position as the result of a developmental accident, but that they are not mutually interdependent we know by clinical experience; it is quite possible for the serous membrane to be caught or hung up in this way without any interference with the descent of the testis. It is clear that when this occurs in the case of a portion of the tunica vaginalis, the serous membrane must be drawn out into a long process such as is presented in cases of infantile hernia. Moreover, this occurrence, as I have described it, will not in any way affect the course of events in respect of the true funicular process, which will lie behind it. Should an ordinary funicular sac be formed in the usual way, and a hernia descend into it, the phenomenon of infantile hernia will be presented to the operating surgeon.

Now, the two cases that I have described were both of them variants of hernia inguino-superficialis, because the upper extremity of the process *x* lay superficial to the abdominal wall. One may, I think, reasonably assume, however, that there must be occasionally cases of infantile hernia which are variants in like manner of the interstitial and properitoneal forms of hernia. In such cases all the appearances would be identical with those presented by my two cases, with the sole exception of the position of the upper extremity of the long process *x*. In the one case corresponding to interstitial hernia this would, I imagine, be traced to between the abdominal muscles; in the other corresponding to properitoneal hernia it would pass right through the length of the inguinal canal, to lie in the subperitoneal tissue. In this last case the simulation of the true funicular process would naturally be specially misleading.

To put the matter in another way, which also serves as a convenient recapitulation of the whole subject, I would state it as follows: Infantile hernia stands in close relationship to the forms known as interstitial and properitoneal hernia and hernia inguino superficialis in the following way. All four varieties depend on sacculatation of some portion of the processus vaginalis, the sacculatation being obviously due to developmental implication of the process in the musculature of the abdominal wall. For the production of infantile hernia it is only essential that the part of the processus vaginalis implicated shall be the tunica vaginalis testis and not the funicular portion, and usually the testis descends completely, although Mr. Lockwood has met with an interesting case in which the testis was retained. In the other three forms of hernia the part of the processus vaginalis implicated will be the funicular, as distinguished from the testicular portion of the processus vaginalis, and the character of the hernia will be unaffected by the behaviour of the testis as regards its descent or non-descent into the scrotum.

AN ACCIDENT OF TAXIS.

It would appear that certain recorded cases of infantile or encysted hernia that disclosed a very curious state of affairs during operation, and which have established

themselves firmly in the literature of infantile hernia, may be misleading. The typical case of the class to which I refer is that of M. Méry (1701), which has furnished the subject of an interesting note on infantile hernia by Mr. Macready that appeared in the BRITISH MEDICAL JOURNAL of March 26th, 1892. One of the objects of Mr. Macready's contribution was to call attention to the fact that this case of M. Méry's was the first case recorded of infantile hernia, contrary to the general belief, which ascribes priority in the matter to Hey of Leeds (1764). The case is so interesting that perhaps I may be permitted partly to transcribe it from Mr. Macready's article.

Case of a man, aged 70, with large right inguinal hernia, strangulated, and apparently gangrenous. M. Méry incised the coverings of the hernia, and no sooner were they divided than a blackish fetid fluid escaped, leaving a large cavity, "in which I saw the testis sound and naked." He expresses his astonishment at this, and then his still greater astonishment on seeing in this open cavity *un intestin aveugle*, healthy and not tense, instead of being gangrenous, as he anticipated. "This *intestin aveugle*, from the groin to the bottom of the tumour, was separate from the membranes of the scrotum, but it was so closely united to the ring of the abdominal muscles that, despairing of overcoming its adhesion without rupturing it, I proposed to M. Petit to leave it and to content ourselves with dilating the rings; of this he did not approve. I then separated this supposed intestine from these parts of the muscles and returned it to the belly. I perceived that in returning it to the abdomen it was still adherent to the peritoneum." The patient died. At the *post-mortem* examination a mortification of that part of the ileum which had been strangulated was found with a rupture of two-thirds of the circumference of the gut and extravasation of faeces. The gangrenous part was nowhere adherent. After careful examination of the parts in the groin, "I found," he says, "I had been mistaken, and that the part which I had taken for *un intestin aveugle* was only the peritoneum prolonged in the form of a cul-de-sac into the scrotum. In ordinary hernia the prolongation of peritoneum (sac) is always found united to the membranes of the scrotum on the one side, and to those of the testis on the other; but, on the contrary, in this hernia it (the sac) was entirely separated from the one and the other."

Mr. Macready remarks that this case appears to admit of only one interpretation, namely, that it was a case of infantile hernia, and it certainly would appear to do so; no other interpretation would have occurred to me had it not been for the following experience in my own practice:

A man, aged 31, admitted to the Alfred Hospital, November 9th, 1905, with strangulated right inguinal hernia. Unsuccessful attempts at reduction had been made prior to admission. An operation was performed. On opening what appeared to be the hernial sac dark fluid escaped and coils of deeply engorged intestine were seen. The "sac" reached to the bottom of the scrotum, and the testis was found lying in it. Pendent from the upper part was a second sac, lying loosely among the coils of strangulated bowel, and having no connexion with the coverings of the hernia, except at its neck, where it was attached to what was apparently the front part of the circumference of the neck of the main "sac." This second sac contained omentum which was evidently not strangulated. Close examination disclosed the explanation of this curious condition, which was as follows: It was the result of an accident of taxis. Just above the neck of the original sac the peritoneum had been torn, and through the rent the strangulated intestines had escaped and come down by the side of the sac, causing it to appear pendent among the coils. What at first appeared to be the sac of the hernia would therefore be one of the coverings of the cord, doubtless the infundibular fascia. The operation was accomplished by laying open the canal by incision of the external oblique; the intestines were returned, and the funicular sac removed after separation and return of the omentum; the rent portion of the peritoneum was included in the ligature. That the sac was an ordinary funicular sac, containing omentum from birth, I have no doubt whatsoever. I found on examining the left side a similar funicular sac containing omentum there, and after an interval of a week I removed that also. Recovery from both operations was uneventful.

The points of similarity between the case I have described and that of M. Méry are very marked; there are, of course, points of difference, but even if we were to assume for a moment that they were actually identical in nature, it would be quite reasonable to look for quite considerable diversity in the accounts of the different observers. All surgeons who have been in the habit of closely examining varieties of hernia during operation will know that to observe and to interpret accurately is by no means an easy matter, and that even much practice and experience will not secure immunity from occasional moments of perplexity. It is remarkable that cases such

as I have described are so few in surgical literature; they can, I believe, almost be counted on the fingers of one hand. That they should be practically unknown at the present day is not remarkable, because the taxis is employed to a relatively slight extent as compared with former times. We must also remember that our predecessors in whose hands such cases were more likely to be met with could not have the practice and training in examining herniae that we have, seeing that their opportunities were entirely confined to cases in which strangulation was present. I think, therefore, that there is good ground for a very reasonable suspicion that some of the most notable cases of infantile hernia that have acquired an established position in our records may not have been genuine cases of infantile hernia at all, but may have been produced, as in my case, by an accident of taxis.

REFERENCES.

¹ *Medico-Chirurgical Transactions*, 1886. ² *Lancet*, March 12th, 1904.

An Address

ON

THE USE OF FILIGREES OF SILVER WIRE IN THE CURE OF HERNIAE USUALLY CONSIDERED INOPERABLE.

READ BEFORE THE NORWOOD DIVISION OF THE BRITISH
MEDICAL ASSOCIATION.

BY LAWRIE MCGAVIN, F.R.C.S.ENG.,

SURGEON TO THE SEAMEN'S HOSPITAL SOCIETY; LECTURER ON CLINICAL
SURGERY, AND TEACHER OF OPERATIVE SURGERY IN THE
LONDON SCHOOL OF CLINICAL MEDICINE.

GENTLEMEN,—In thanking you cordially for the honour you have conferred upon me in asking me to address you, I must confess that when some time since your Secretary approached me with the suggestion that I should deal with the subject of Filigree Implantation, I felt some diffidence in appearing before you. I thought the subject, although to my mind one of considerable importance, might not present itself in a particularly interesting light to you; if, therefore, this should be so, I trust you will bear with me, for the sake of those who suffer from the condition which I propose to consider, while I endeavour to lay before you a method of curing, in the truest sense of the term, those cases of hernia which have hitherto appeared, to surgeons and physicians alike, to be beyond the range of legitimate surgery. The cases to which I refer may be classified as follows:

1. Those of repeated recurrence after operations generally known by the misnomer of "radical cure."
2. Those of such dimensions that the probability of firm union of the deeper tissues is open to grave doubt.
3. Those in which there is a chronic condition present tending to the constantly repeated increase of intra-abdominal tension; such, for example, as chronic bronchitis, asthma, constipation, urethral stricture, etc., especially where these are the concomitants of old age and feeble muscular development.
4. Those cases in which the hernia is the direct result of loss of some portion of the abdominal wall, in consequence of accident or the operative removal of tumours.
5. Those simply of hernia in patients beyond the age at which it is reasonable to hope for a cure by the ordinary methods.

Now, if you will consider for a moment the question of the recurrence of hernia, and the factors upon which it depends, you will, I think, agree with me that, putting aside all other contributory causes, the chief reasons of the reappearance of a hernia are the employment of unsuitable methods of operation, the occurrence of deep suppuration, and the undue curtailing of the period of convalescence in the recumbent position.

With regard to the two latter points I need say little; they are usually avoidable, and, provided the method of cure is suitable to the needs of the particular case, the accident of recurrence should be a very rare event. Few of us, however, have finished our hospital career without having seen recurrences after operation which led us to wonder who the optimist could have been who invented the immoral term "radical cure," and how many unfortunates have been condemned to wear trusses of all shapes and sizes, in an endeavour to control a protrusion which

marked the site of a "radical cure" of former years! I do not propose to tax your patience by a dissertation on the dull subject of the application of trusses to herniae, but I would maintain very emphatically, that an operation for the cure of hernia which requires the subsequent application of a truss to prevent its return, can in no sense lay claim to the term "radical cure." I am personally very much opposed to the use of trusses in all but perfectly inoperable cases; and by inoperable I mean those which, from their huge dimensions, preclude the possibility of returning the hernial contents to the abdomen, those in which some diathesis such as haemophilia is an absolute contraindication, and those in which the patient steadfastly refuses to undergo any cutting operation. It is most disappointing for a surgeon to have to undertake the attempt to cure a hernia whose coverings have been thinned out, matted together, and histologically altered by years of truss pressure. Such cases have long since passed from the stage in which the ordinary operative methods might be expected to result in a true cure.

If I might be permitted to offer you advice on this point as a surgeon, it would be never to apply a truss in any case that is operable, for by so doing you will vitiate the chance of cure by operation in subsequent years. Do not presume that a case is inoperable simply because of the size of the hernial orifice; modern surgical methods have brought within reach many cases which from their size alone are certainly not within scope of the older operations. Lastly, do not make use of the term "radical cure"; it is misleading alike to patients and to their friends; but if you do use the term, let it be reserved for cases of hernia (excluding femoral hernia) in young and healthy subjects, and for those which may be submitted to the method which I am here to introduce to your notice—namely, that by the implantation of a prepared filigree of silver wire.

I do not wish to trouble you with statistics of the frequency of recurrence of hernia; the tendency to this unfortunate accident is sufficiently well known to all of you; but I wish to draw your attention to one or two points which may help to further explain the reasons of such an occurrence.

The question as to which layer of the abdominal wall is the chief delinquent in the formation of a hernia is still, I believe, *sub judice*. At one time it was supposed to be the peritoneum that held this unworthy position, but, as I have elsewhere pointed out, this theory is erroneous. The peritoneum has no influence in the production of a hernia where it is backed up by sound abdominal wall, nor of a recurrence where the sac has been efficiently removed. Some writers have laid stress on the importance of accurate union of the fibrous aponeuroses of the rectus muscles in median hernia, and have split, fashioned them into flaps, and overlapped them, apparently with little result. But few, however, have assigned to the musculature its full importance. Those of you who will cast back in your memory and endeavour to call to mind any case of hernia which you have seen submitted to operation, either inguinal, umbilical, or ventral, will, I think, realize that in no case have you ever seen muscular tissue (excluding, of course, the cremaster muscle) forming part of the coverings of a hernial sac. A hernia in its descent will always choose the most inelastic structures through which to force its path. These it will pick out and patiently stretch, almost as if it knew it would not have to do so a second time. Muscle fibres, being composed of very highly organized and elastic material, refuse obstinately to be permanently stretched. They may be pushed to one side and allow less important structures to give way to pressure, but they will not stretch and cover a hernial sac. Where are examples of this to be seen? Firstly, in the median line, where the recti muscles, being forced apart, permit a hernia to pass between them; secondly, in the hypertrophied bladder of stricture and prostatic enlargement, where the muscular fasciculi, although hypertrophied, allow the sacculated mucous membrane to pass between them; thirdly, in cases of ventral hernia following wounds, where only the cicatrix stretches, the muscle never forming part of the sac. The reasonable inference to be drawn from these facts is—that it is upon the musculature of all other structures that the duty of withstanding the extrusion of the abdominal contents devolves. If only the recti muscles could be kept in close contact with each