Thesis for M.D. degree of the Edinburgh University by George More Reid.

"On the Radical Cure of Hernia with special reference to some of the methods that have been adopted for that purpose"

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the writings of those who declare against a Radical cure, their objections are seen to be based on the answer, that they believe should be given, to the second question. In short they say, that because operations for radical cure have not as yet proved a complete success, and in some instances, have been not only dangerous but fatal, and as a suitable truss, is usually sufficient to relieve the sufferer, therefore operation should not be undertaken. For example Bryant in one of the earlier editions of his text book says, "I believe that when a hernia, can be kept up by a truss, and the patient is likely to remain in a civilized country, where trusses can be obtained, any operation for the Radical cure

Ed 1872
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of hernia is an unjustifiable one;
to risk the life of the patient on the
theory of a cure, with the probability
that the patient will be rendered
less liable to its descent, when a
truss has to be worn subsequent
to the operation, as a matter of safety
is a practical delusion."
An opinion so strongly expressed,
as this and coming from a Surgeon
in the position of Mr. Bryant, ought
to be received with all respect.
But if we put aside for the present
the question, as to the safety and
success of the operation as that have
been performed for this purpose,
and consider only the question
of desirability, it can hardly
be doubted, that most Surgeons
(including Mr. Bryant) would answer
in the affirmative.

The matter is put in a nutshell by asking "Which is better to have, or not to have a hernia."

If it is better not, then a radical cure is a desideratum.

Hernia can hardly be considered otherwise than as evil: some authors call it "only an inconvenience". It is indeed an inconvenience, and a very serious one it may prove to be. It incapacitates its victim, from taking his proper share in the actual duties of life; it prevents him occupying many offices, which he might otherwise do with advantage to himself, and to society. In many cases it causes the insurance premium to be raised, which shows that they consider it an extra risk.

At one time it was considered to be an immoral disease. Such

views are no longer held, but a feeling of delicacy or shame. (improper no doubt but not less powerful for all that.) prevails among who believe it to be, an incurable disease, applying for the relief they ought to receive from Trusses. They are so sensitive about it, (and probably more so from their believing it to be incurable). that they make it a secret and hide it, till only the grave consequences of a strangulation appear, and compel them to apply for relief. "but more than this" Mr Paxton points out." frequently gives rise to a morbid mental condition. the patient becomes a prey to every depressing influence which brooding over such a state is certain to induced, he conceives

Paxton's Pamphlet

himself to be the victim of a defect which can only result in physical incapacity and misery: dyspepsia and its innumerable train of grievances follow; and the life of the hernial man is, in many instances rendered an unhappy and to often a useless one". Besides this, there is the fact that not unfrequently, whether from want of a truss, or an insufficiency of it, a strangulation of the hernia may occur. This condition if not relieved by taxis, or a cutting operation, usually proves fatal, and even after taxis or herniotomy, a fatal result may occur. Such are some of the risks and "inconveniences" a hernial individual is subject to. Further hernia is a disease or deformity of very wide spread

prevalence. It affects a very large proportion of mankind, some writers calculate that from an eighth to a sixteenth are so afflicted. Malgaigne considered, that one in every thirteen of male males was ruptured.

Spanton Pamphlet

Around one in every eight.

Some slight idea of its extent, may be got when it is stated that Mess. Son & Thompson of London make at the rate of 33,000 trusses every year, most of which are for this country, and this is independent of those made by other makers.

The writer, during his residence in an up country town in Victoria Australia, with a population of about 10000, on an average fitted on 300 trusses every year.

Spartons Pamphlet

Many recruits for army & navy are annually rejected because of it. Dr. J. H. Baxters statistics, of examinations for military service, in the United States army during the War of the Rebellion, show that of 304.508 rejections, 38.132 or more than one eighth were because of hernia. Thus there is a great loss to the community of men who might otherwise be able to serve it well. Such considerations as these, make it extremely desirable, that hernia should be cured. In some cases this is done by means of a truss, and if a truss were curative in all instances, there would be no need to discuss the question of operative procedure, but in the vast majority of cases, it is

only palliative. We are led then to consider the second question "Can a radical cure be effected easily, safely & with presumption of Success"?.

The answer to this, can only be arrived at after a consideration of the methods, that have been adopted, (for the cure of hernia). As the Inguinal hernia is the most common form, and the one to which most attention has been paid, by those who have aimed at a radical cure, it will be most convenient to consider it. only bringing in the others as they may seem to bear on the subject. The greater number of operations up to 1858 were performed on very unscientific principles and many of the

older methods were both absurd and barbarous. Few were based on even an approach to a correct knowledge of the cause, and pathology of hernia, and many of them were positively dangerous. Yet successful results, have been put on record. * Hildanus tells of a case where the horizontal position in bed, with low diet, effected a cure in six months.

Blood letting, purging &c. were adopted in other cases in addition to the position. Compression and the use of astringents was a favourite with many, and could have done but little mischief, had not some writers in Germany recommended its application so powerfully as to cause gangrene. Some opened

*Coopers S. Dictionary 7th Edit (p 706)

Warren on Hernia p 96 "

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Warren p 100 the sac and having reduced the contents removed it along with the testicle. Others cauterized the " 97 interior of the sac a very dangerous proceeding. Less dangerous but equally valueless, were the opera- " 100 tions of the "Royal stitch" and "punctum aureum". The former consisted in opening the sac and sticking the edges close, so as to obliterate the cavity. In the latter a golden wire, sometimes a leaden, was passed behind the sac and cord and tied tightly enough to close the sac, but not so tightly to prevent the circulation going on in the cord. Other methods had for their object, " 97 the closure of the sac by causing adhesive inflammation of its interior. Wood p. 80 In some cases this was effected by passing a seaton and leaving

it in for a time. In others an irritant was injected into the interior of the sac. M Velpeau in Paris & Prof Lancaster in New York, first introduced this method using a solution of Tincture of Iodine or Cantharides.

Wood on Rupture p 80

Rankins Abs Vol IV 1854 (p 159)

and in 1854 M Jobert presented to the French Academy an account of three cases in which he had successfully performed the operation. Two of them were congenital hernia, and one of these suffered also from hydrocele, which was cured at the same time as the hernia.

M Jobert did not allow the iodine to remain permanently in the sac, but withdrew it by syringe, shortly after injection. M Bonnet of Lyons endeavoured to close the sac by transfixing it with pins below the external inguinal ring.

Wood 81

a procedure which could only convert a scrotal hernia, into a labonocele. None of these methods, can be considered as strictly scientific, they aimed at obliteration of the sac. A knowledge of the pathology as well as the cause of hernia, would have shown their inventors, that when they did succeed it was only by closing a sac, already formed, which did not prevent the formation of another. leaving as they did open rings, and a canal down which bowel might force another peritoneal protrusion.

Putting aside the danger of sepsis, they could only succeed in cases where the canal happened to be narrow enough to prevent the formation of a second sac.

Later operators said that it was not the sac, but the condition of the

canal that was at fault. The sac was only an accident - one which had to be provided for no doubt, but not the main feature of the hernia. They saw that somehow or other the canal must be closed, but it was not at first seen how this could best be done. Earlier operators endeavoured to do it, by simply plugging the canal, plugs of various kinds have been used. In some cases of Entero-epiplocele or simple Epiplocele an endeavour has been made, to insert the omentum into the rings, which it was hoped would then contract, so that the hernia would not reappear. It is stated that Cooper Stephens Velpeau and Goyrand obtained cures by this method. It is however applicable only to a limited number

Warren 181

of cases, is uncertain and may be
production of serious inconveniences
by dragging on the stomach or other
Warren viscera. The testicle has been
101 p recommended to be used as a plug,
but such an operation is not one
calculated to find favour. The
" hernial sac itself has been used
for the same purpose. In 1829
an ingenious operation was tried
Warren by Delmas upon dogs, and with
103 p success. It consisted in the
introduction of a small piece of
gold beaters skin into the upper
part of the sac; the plastic matter
poured out by the irritation set up,
from the presence of this body,
penetrates the material of which
it is formed, and becomes incor-
porated with it. Organization is
said to take place, and a resisting

barrier to the protrusion of Viscera is formed. The operation was performed first on a boy of 14, his life was in danger for ten days, but he ultimately recovered, and is said to have been Radically cured. In at least one case, a plug of skin was formed and turned into the femoral canal with success. The patient was a lady extremely anxious to have a radical cure performed, and the operator was Jameson of Baltimore.

Warren p 101

Still later attempts have been made to plug the canal by an invagination of the skin, and tissues beneath it.

Warren p 102

In 1837 Gerdy proposed and performed an operation, in which a fold of skin, was pushed up into the canal, carrying a portion of the glandes of the hernial sac,

before it. Two patches were then passed thro this to the skin of the groin, tied over a compress and made to retain the invagination. Still adhesion was supposed to have taken place within the canal. Sometimes in addition an attempt was made, to cause adhesion of the surfaces of the invaginated skin, by painting them with strong ammonia. Very often when the patches were removed the plug gave way, and seldom remained, any length of time in the canal. It not, unfrequently, too, proved fatal and has long since deservedly fallen into disrepute. In 1838 Wartzer of Bonn proposed a modification of Gerdy's method. in so far as that he recommended the use of an instrument whereby the invagination of the skin

Warren p 104

might be carried out more easily and effectually. This instrument consisted of three parts (or four if we include the screw). - a cylinder for the canal, a curved needle running through the cylinder, and a cover usually made of a concave shape to lie over the skin of the groin and compress. The skin and tissues underneath were first invaginated into the canal, the cylinder was then pushed in, and the half curved needle passed through it, to transfix the upper portion of the invagination, the canal & the skin of the groin. It was then passed through a hole in the concave cover, the other end of which was fixed to the lower end of the cylinder, by means of a screw, and pressure thus effected. This differed from Gerdy's method in the plug being

retained till adhesions had formed, which it was hoped, would permanently retain the invaginated skin in the canal. As a matter of fact, they did not. They proved too weak. The canal was dilated rather than contracted, and the rings left open. Wurtzer operated on 14 cases in Bonn, not one of which was permanently cured, the invagination in every one gradually descended. These operations were founded on the erroneous principle of dilating a canal for the purpose of reducing it in calibre, and as a consequence they failed. Neither of them are now performed.

Warren p 105

In 1858 John Wood by a careful study of the appearances and condition of the inguinal canal in hernia came to the conclusion that any

operation to be successful, must not only close the rings, but must unite the anterior & posterior walls of the canal as well, more especially at the upper part, where the rectum by its contractions, acting on the posterior wall, greatly helped the dilatation of the canal after it had begun. Sir W Lawrence, had already indicated this, in his great work on hernia. But it is to John Wood, that the credit belongs of being the first, to devise and perform, an operation whereby the canal, might be closed in the way mentioned. He had like previous operators, to consider the presence of the sac, and got rid of the difficulty by invaginating it, along with a portion of scrotal fascia, into the canal. Thus using it as a plug

but at the same time bringing the walls as closely together as possible, by means of suture. In congenital cases, where the neck of the sac and canal were very narrow, he was able to perform the operation without invagination. The necessary instruments for the operation are, a small knife like a tenotome, a full curved needle set in a handle, and a piece of strong copper wire silvered, or silver wire itself. In his earlier cases, hempen ligature was used, but this seemed to produce much greater irritation, than was necessary. He therefore adopted the metallic suture which was so strongly recommended about that time by the late Prof Simpson. The operation with ligatures differs slightly from that by wire. but as it is not now performed

there is no need of going into details regarding it. The patient is prepared as he would be for any other operation, and put under the influence of an anesthetic. Pubis and scrotum of affected side are then clearly shaved, the shoulders are well raised, the bowel is reduced, and kept out of the way, by an assistant. An incision is then made, in the skin of the scrotum over the fundus of the hernial sac; or a little more than an inch below the spine of the pubis, if the hernia be a bubonocele. This should be large enough to admit finger and needle. The fascia is then displaced from the skin to the extent of an inch all round the incision. The finger is then passed through the incision behind the sac, and pushed up into the canal carrying

sac and surrounding fascia before it, as far as possible. The edge of the internal oblique is then hooked forwards, making the edge of the Conjoined tendon prominent. The needle is then passed through the incision, along the inner side of the finger, through the scrotal fascia, invaginated upon it, and probably also through sac, and made to transfix the conjoined tendon. A firm "grip" of this must be obtained. The point of the needle is then made to pass out through the skin of the groin, which is drawn upwards and inwards, before the puncture is made. One end of the wire is then fixed in the eye of the needle, which is quickly drawn back through Conjoined tendon, canal, and scrotal wound. It is then disengaged from

the wire and passed a second time into the canal, but now along the other or outer side of the finger up to a level with the internal opening, where it is made to pass through aponeurosis close to Poupart's ligament. The skin of the groin is drawn downwards and outwards, to permit of the point coming through the puncture just made. The other end of the wire, is then fixed to it, and pulled through the tissues, to the scrotal incision, leaving a loop outside in the groin. The needle is again disengaged from the wire. The tissues in front of the cord, including the portion of the hernial sac that is not invaginated, are then taken up between the finger and thumb, the needle passed beneath them and one of the ends of the wire, fixed in the eye

of the needle, and drawn through D.
Sometimes the pillars of the external ring are included more especially in direct hernia. The sac may be punctured or not. The two ends of the wire are then pulled down so far as just to admit the finger of an assistant within the loop left in the groin. This loop being firmly held, the ends are twisted three or four times, below; the wire is then pulled up by the loop, and thus the invagination is increased and made secure from slipping.
The loop is twisted three or four times also, and united with the ends over a roller bandage or a pad of lint. A broad spica bandage is applied over the part to keep the pad in place and make compression.
The after treatment is conducted

on general principles: for some days.
The sores are untwisted about the
eighth or tenth day, but not removed
for five or six days more, after
which an astringent may be used,
to hasten the healing of the fistulous
tract left by them. As soon as
the parts will bear it, Wood recommends
the use of a light truss of proper shape.
In congenital hernia invagination
is not practised. The necessary
instruments are a couple of pins
half curved with a head at right
angles, about three or four inches
from the point, the head being
made so as to form a loop large
enough to allow another pin to pass
through. The hernia being reduced,
the finger is passed within the canal
up to the internal ring, and parts
examined. One of the pins is then

passed through skin and tissues in front of the canal, and slipped down alongside of finger so as to transfix conjoined tendon and internal pillar of outer ring, then over fundus of hernial sac, and out through skin of scrotum. The second pin is passed in at this point, and the finger placed below it, pushes the scrotum into the canal. The pin is thus carried through the outer pillar, and up towards the puncture by which the first pin entered, and through loop in angle of the pin, so that both pins may be locked together. The sac is penetrated by both pins. The points are removed and the heat ends twisted round once which is done easily by turning the upper pin towards the thigh.

The punctures being guarded by lint a small pad is put over the groin and kept in position by means of a spica bandage.

The effects produced by these operations are said by Wood to be (1) the union of the conjoined tendon and inner pillar of superficial ring (in direct cases the edge of the rectus muscle) with Poupart's ligament, and the outer pillar of the ring.

(2) The prevention of dilatation of the superior and posterior portions of the canal by making the rectus act on the anterior wall of the canal, as well as the posterior through the cicatrix formed.

(3) Obliteration of the sac by the adhesive inflammation set up by means of the wire or pins. Which with the compression of the neck of

of the sac. prevents the protrusion of the bowel into it.
(4) strengthening of the consolidation that forms a barrier to hernial return, by the invaginated parietal fascia the opposing raw surfaces of which unite. (5) Support of adhesions further up in canal, by union of pillars of the hernial ring, especially in direct hernia.
We have now to ask ourselves, "Is the operation one that can be performed with safety to the patient?" The theoretical objection of its being performed near to structures (cord epigastric artery & peritoneum), that it would be dangerous to meddle with, does not seem a valid one. It might be said with equal truth that ovariotomy should not be performed, because

the internal carotid is in the vicinity and has been wounded by some surgeons. In the hands of a skilful operator these structures need not be involved in the operation. The risks are however sufficiently localized to prevent any but skilful operators performing. We are more likely to arrive at an idea of the amount of danger by looking at the results that Wood himself has had. In the most recent account given by him, he had performed the operation 310 times. In 167 of these the results had been verified as to success or non success, but out of the 310, there had been only 3 deaths, and these occured in the first hundred cases, none in the last 210. Death in the first case at least was due to an accident.

Amer Pract Aug 1882 p 88.

that might have followed any other operation, and not to anything special in the operation itself, or its mode of performance - Pyemia occurring three weeks after. Apart from the danger to life, there is risk of atrophy of testicle, should the cord be interfered with, but sufficient care should enable the operator to avoid this.

With regard to the success of the operation, Mr. Wood reports that of the 167 (out of 310) of which the results have been verified, there have been 119 cures after a lapse of from 2 to 24 years. Recurrence but to a much less extent, than formerly occurred in 48 cases. Looking at the matter theoretically however one cannot be surprised that there should be a recurrence

in many cases to the extent of a bulging in the groin. The operation seems to be imperfect in the respect that the internal ring is not sufficiently acted upon. (closed.) Doubtless attempts to effect this would be exceedingly dangerous, but nevertheless it is one of the drawbacks of the operation, for only the external ring and the lower portion of the canal are completely closed, and thus all that the operation can be said to effect is the formation of a barrier to the protrusion of viscera, below the arched border of the internal oblique and conjoined tendon, and thus a chance is given to nature to effect a cure itself. Coci in the hands of Wood himself it cannot well be said

to do more, and thus all that the most sanguine operator can say is, that by this operation a better chance of cure is given than by the wearing of a truss or any other means that had been previously adopted.

Next to Woods operation may be placed "Spantons" not chronologically but because of its manner of performance. Spanton considers that the drawbacks of Woods operation are that "a hold is secured on the pillars of the ring at two points only, while the indaginated tissues are forcibly drawn up in such a way as in some measure to defeat the object the surgeon has in view of approximating the sides of the canal as much as possible"

Brit. Med. Journal Dec 11. 80

To avoid these drawbacks. he proposes

that the walls should be brought together and the invaginated tissues and sac secured by means of a corkscrew instrument nickel plated. With a fine point moveable handle. The preliminaries of the operation are similar to those of Woods.— the incision in the scrotum. and the invagination of sac scrotal fascia. With the forefinger in the canal an examination is made of the parts around. The screw instrument is then thrust through the skin of the groin. and tendon of the external oblique. opposite the internal ring; it is then made to pierce the conjoined tendon as high up as possible. The internal ring is said to be practically closed when this is done. The screw is then turned through the invaginated tissues. then through. the outer pillar, across

to the inner pillar of external ring and through it. after which the point is brought out through the wound in the scrotum. The point is protected by a ball of india rubber and a pad and bandage placed over all. The instrument is left in for a week, usually after which it is removed. A similar operation is performed in congenital hernia, the tunica vaginalis being invaginated instead of the sac. In some cases instead of leaving in the seton, it, has been threaded with cat gut, or tendon ligature, and withdrawn along the tract made by its entrance, and passage through the canal. Each end of the ligature is then tied to a glass rod, laid over the groin. But the results do not seem to have been so satisfactory, as when the

screw alone was used. In the British Medical Journal of July 22. 82 W. Spanton reports 57 operations and gives details of 34. none of them have proved fatal, and in none has the temperature risen as high as 102 F. 30 are considered as cured, 4 as relieved. none are made worse by it. Of the 30 returned as cured, in two there was a slight tendency to return, but in one this disappeared after the use of a truss. As to age all the cases were under 20 - 18 of them were under 10, - 9 ranged from 10 to 20, while 7 were over 20. - 27 were males. 7 females. Of the 7 above 20, 3 were females. - 14 of the cases were congenital. It may be noted that W. Spanton prefers that no truss should be worn after the

operation, or if one is necessary that it should be a simple pad truss without a spring. As to the question of safety this operation must be regarded as one of the most satisfactory that has yet been performed for the radical cure of hernia. There have been no deaths, and slight if any fever. Of course it may be argued that it has been performed principally on healthy children. So it has. But this is no objection for no one would think of performing such an operation on an unhealthy person. It is also an operation that is more easy of performance, than Woods, and must be considered at least as successful. The same objection would however seem to apply to it as to Woods. That it is the external

ring and lower portion of the canal that are closed. the internal ring being to some extent still left open. The Writer saw M Annandale perform this operation twice during last Winter session. The first case was a man between 20 & 30 with a large scrotal hernia which almost incapacitated him from working. he was discharged cured. The other case was a boy about 2 years old also with a scrotal hernia who had had an operation for the radical cure unsuccessfully performed in Glasgow about a year before. discharged relieved so that the hernia could be kept up by a truss

Other modifications have been proposed, one of the best of these being recorded in the British Medical Journal for Dec 25 1880. by Dr Whyte of Elgin. In a case

of double congenital inguinal hernia in a boy of 18. he passed a specially prepared carbolized suture in a bootlace fashion through walls of canal and invaginated sac of hernia, with marked success. It is not perhaps at first sight easily understood. but once it is, it will be found comparatively easy of performance.

Listerian antiseptics have been the means of reintroducing some old operations, that have been given up because of their dangers. Now of them are equal to the one recommended by W. Mansdale, which owes its existence entirely to antiseptic surgery. That is ligature of the neck of the sac, and excision of the sac, and stitching together the margins of the abdominal

opening. Objections to other methods need not be gone into as they are not now performed. In this operation the neck and upper portion of the sac are exposed by a free incision the sac opened and the contents returned. If there are any adhesions of viscera to sac they are ligatured and divided. The neck of the sac is then thoroughly exposed and a ligature passed round it as high up as possible. The sac is cut away immediately below this. and the margins of the opening and stump of the sac are sewed together with a continuous suture.

Braithwaite's Retrospect 1881

By the abdominal opening Mr. Annandale seems to me on the external ring for in detailing one of his cases (p. 4) he writes "the neck of the sac was ligatured

the sac cut away and stitched to the margins of the external ring in the usual way". Several successful cases have been recorded. But the same theoretical objection seems to apply to it. as to Woods viz. that the external ring and the lower portion of the canal are closed against the hernial protrusion. That the operation is practically safe there is little room to doubt. That it can be performed with ease is seen whenever surgeons do it. That it is a success there is some doubt among surgeons. Mr. Ivy in the American Pract.r for Aug 1882 writes. "It is useful for cases of irreducible hernia and for some cases of reducible or strangulated hernia in patients beyond the age of 30. and for

those in whom owing to ill health it is not advisable to proceed to the major operation of Wood. It is not difficult to perform. but it does not afford so firm an indagmating material nor as copious an exudation of lymph as Woods operation". He also considers that no patient should ever be without a truss after the stitching operation. On the other hand, Kennett McLeod in the Indian Medical Gazette of June 1. 82 considers it the most promising operation for radical cure. According to him it combines (1) An assurance of obliteration of the sac, (2) occlusion of it at the internal ring. (3) plugging of the canal from within, and (4) approximation of the sides of the canal after the manner of Wood.

"(This last is not brought out in W. Annandales paper as he mentions only the external ring and stump of the pad). It secures all the advantages of Woods operation with greater precision and accuracy, inasmuch as every thing is done under the eye, it removes the two great disadvantages of Woods operation, viz uncertainty regarding the treatment and fate of the pad, and invagination of structures from without, which had a constant tendency to be pulled down, and it provides a solid plug from within, which assists in closing and corking the canal and most materially aids in preventing subsequent descent".

It is however a doubtful matter whether the objection that has

been shewn to exist to Wood's and Spratons operations does not also exist here, viz an incomplete closure of the internal ring. The operation would appear to be more applicable to cases of femoral hernia where the canal being so short the strangulation is more likely to play it.

Warren on Hernia

The last operation is one that comes to us from America, and is connected with the names of Heaton & Warren.

Heaton on Rupture

It has not as yet received sufficient attention in this country. There would seem to be two reasons for this neglect, 1st its somewhat unfortunate history, and 2nd its not being properly understood. It consists essentially in the hypodermic injection of an irritant upon the rings, and walls of the canal, through which the

hernia has come. that is to say "those portions of fibrous tissue lying directly in contact with the interior of the neck of the hernial sac". For the operation a hypodermic syringe and needle are required. The needle is not that ordinarily used. It must be stronger and less liable to bend or break. It should not open at the point, but by two or more apertures in the side, a little way from the point, so as to throw the injected material at right angles upon the tissues. Dr Warren recommends a spirally twisted needle. because it is made to pierce more easily than the ordinary flat or round shaped needle. The point should not be too sharp. The irritant used

is a preparation of oak bark usually the liquid extract and may have either or alcohol. besides a small quantity of Morphia salphate added to it. The amount to be injected varies from 10 - 30 minims, and depends upon the calibre of the canal. (or this operation is said to be applicable to femoral & umbilical as well as inguinal hernia) and upon the condition of the parts. The hernia is first returned to the abdomen, and if possible the sac along with it, an effort being made to empty the canal, as much as possible. If it cannot be returned as in the majority of cases it cannot, then it must be left in the canal. The skin is then invaginated into the canal in front of the finger the operator

cord and pad, are pushed aside so as to leave only skin & fascia between the outer pillar of external ring and the finger. The needle is introduced at this point so as to enter the canal at once, grazing the pillar, but not cutting it. The finger is then removed and the needle pushed gently on towards the internal ring, Care must be taken not to touch cord and not to enter pad, nor penetrate the fascia transversalis. When it has been pushed up to this fascia, the injection begins and is continued as the instrument is withdrawn. If necessary the point may be moved about so as to sweep over the tissues. The injection stops as the needle is withdrawn from the external ring.

so as not to act on the tissues in front of the canal. A pad and spica bandage is then applied and the patient kept in bed for 10 days or a fortnight. A cure is said to be obtained in this way sufficient to allow of a truss being dispensed with in from three months to a year after the operation.

Sometimes in larger hernia the operation must be repeated. As to how the cure is effected there is some difference of opinion. Sometime after the operation there is a slight constitutional disturbance, the temperature rising to 100° or 101° F. but this passes off in a few days. Inflammation ought not to occur but there is a slight tenderness on pressure over the canal. An effusion of

lymph is thrown out, which becomes organized, forms adhesions and so unites as in Woods operation. the anterior & posterior walls of the canal thus shutting off the hernia. Nature himself would seem to indicate that the plastic material thrown out acts in itself as a barrier, and that the irritation of the fibres around the walls induces them to contract, so that along with the plastic matter the hernia is prevented returning, and that in this way time is given to allow nature to effect a cure, This contraction he asserts, actually takes place to a certain extent, directly after the operation, and continues to make progress for weeks, and even months afterwards. The neck of the sac is sufficiently compressed

by the material thrown out to prevent blood passing into it and locally it may be counted as in other operations a mere cord. The operation has hitherto been performed without any fatal result, so that no opportunity for an immediate examination of the parts involved has been obtained. Keetow obtained an examination found of his cases, five years after the operation which had been a complete success. The account he gives of it is somewhat meagre.

"I called in Dr. Winslow Lewis to witness the autopsy, upon examination of the growth the appearances were so natural, that it would not have been suspected that he had ever been subject to hernia. The fibrous parts were

as firm, tough and resisting on the side where the hernia had existed as on the side, which had never been ruptured. But it is worthy of observation, that although the healed side did not retain any superior thickness over the normal side, yet the pillars had lost all the thinned sharp edged appearance, which is always presented to a greater or less extent in all hernia, that have existed for a length of time.
The interstitial deposit of fibroid material was able to persist because there was need and use for it in the economy".
He tells us nothing of the sac so that it is to be presumed that this was a case where he was able to reduce the sac, as

well as the hernia. Till more attention has been paid to it a correct knowledge of the modus-operandi will not be attained. There is only one instance of its performance on record in an English Journal (Lancet Vol II 1881 page 375). The patient was a sailor set 22. admitted to Guy's Hospital under the care of W. Bryant on May 18.80. with a right inguinal reducible hernia. which had first appeared about eighteen months before. When at rest it was about the size of a hens egg. after walking it became larger. As the man was anxious to have something done. W. Bryant permitted Dr Warren who was in London at the time to operate. The Report states that Dr Warren reduced the hernia

and inaginated the scrotal skin tissues and hernial sac into the canal but did not as he himself believed reduce the sac along with the hernia. The needle was then passed to the inner side and the injection thrown on tissues to inner side of internal ring and along canal. A pad and bandage were then put on. No anesthetic was used and the patient said he felt very little pain. During the night and following day he felt more pain and the temperature rose to 99.4. On the 21st the report says. "Morning temp 98.6 passed a good night. there was considerable inflammation extending from the external ring on the right side, downwards and over the whole scrotum". Lead lotion relieved this and the inflammation had

subsided by the 23rd. On the 24th a thickening of the cord on the outer side was noticed, but the testicle was not affected. This thickening subsided next day. On the 27th eight days after operation, the abdomen was much distended. there had been no motion for three days and patient was unable to pass water. Relieved by soap & Water enema and catheter. A urethral discharge then made its appearance but there was no pain on micturition. the discharge ceased by the 31st. On Sept 12th the patient was allowed to go about the ward with pad of lint & bandage on. A thickening over external Ring could be felt. He was dismissed on the 15th with orders to wear a truss for six months at least, and to report himself from time to time.

He returned in six weeks.
"The thickening could still be felt.
The invaginated skin over the external
abdominal ring had a tendency to
protrude. But the patient stated
that the hernia had not been down
since he left the hospital." He had
however constantly worn a truss.
He did not again return so that
Mr. Bryant was unable to watch the
progress and result of the case.
So far as it goes Mr. Bryant con-
sidered it satisfactory. But he
hesitated to pronounce any opinion
as to the value of the operation
not having material or results to
enable him to do so. He points out
as a weakness in the operation
the danger of injecting the pus
or even the peritoneal cavity itself.
This report is to a certain extent

unsatisfactory. It does not correspond with Keetons description of the operation. One is led to understand that there was a permanent invagination of skin into canal. Keeton inveighs against Gerdys. Wertzels & Woods operations because of this invagination stating that "the tendency of nature is to get rid of these tissues (invaginated) which are like foreign bodies in the canal and the rectum usually recurs". Moreover as soon as the needle has passed the external ring, he recommends that the invaginated finger should be withdrawn. In the second place we are left to infer that the swelling of the abdomen on the 5th day, and the urethral discharge were the result of the operation.

but are not informed whether inquiries were made as to the previous history of a gonorrhoea. It is only from the context that we see the swelling of the abdomen must have been due to the fact that the condition of the bowels was not seen to for three days. Thirdly Heaton would probably have said the irritation here had been too great, as we find that inflammation occured down to the right side of the scrotum. It must be to a certain extent regarded as a triumph to have obtained an opinion from Mr. Bryant who formerly inveighed against radical operation for hernia. to the effect that so far as it went the case was satisfactory. Were it not for its somewhat unfortunate history it would have been

more extensively tried before this, and we would have been better able to come to an opinion as to its value. It was important firstly in that Keaton for some reason best known to himself would not make his professional brethren acquainted with it, at the time he was requested to do so, practically in their opinion making it a secret remedy for a number of years. It would be unprofitable to treat on the controversy that took place it is sufficient to say, that a little mutual confidence would have helped matters greatly, and put the operation in a position where it could have been extensively tried, and its value tested. This probably because of this unfortunate history that proper attention has

not been paid to it. Even John Wood himself does not seem to understand it for we find him in the London Med Record for 1879 page 390 calling it "a record of helpless discarded plan of injecting the hernial sac, with the characteristic variation of the use of a vegetable decoction viz of oak bark". and even D. Steele classifies it in his "Digest" with operations for the injection of the neck of the sac. Surely they cannot have read with any thing like a degree of care what Heaton has written, that his operation must not be confounded with that of injection of the sac. "Subcutaneous injection of the hernial sac is neither a simple nor advisable operation although successful in many cases

THE RADICAL CURE OF HERNIA BY HEATON'S OPERATION.—Dr William S. Bull reports the results of twenty-one cases on whom he has operated since 1879. He explains that he has had forty patients in all, but nineteen of these had not been seen since leaving hospital, and extended search failed to find them. The operation has proved in his hands, as in those of Heaton, a very safe one, there being no deaths and little constitutional disturbance. In only one case was there enough local inflammation to warrant the application of a cooling lotion for a few days. No swelling has been perceptible externally, but a plug of induration has generally been felt over the site of the canal, which has disappeared within two weeks. A very slight epididymitis occurred in six cases, but subsided in two or three days. One patient had retention of urine for five days, and in another the rupture (omental) came down the day after the operation, and was irreducible for a month. Of the twenty-one cases, five were cured, seven improved, four temporarily improved, and five were failures. Of the seven improved, two might be considered as cured were it not that the patients continued to wear a support. Three others Dr Bull hoped to cure by a repetition of the operation. The patients were all males but one. The ages varied from four to seventy-three, the majority being from twenty to forty. From his experience Dr Bull feels justified in recommending the operation, and is sure that in another series of twenty cases he could greatly improve on this record. In the discussion which followed the reading of the paper in the N. Y. Surgical Society, several other surgeons gave their experience. Dr Weir reported the results of forty-one cases, which he divided into two series of twenty-eight and thirteen. Of the first series eight were successful, and the others improved. He did not place much reliance upon the teachings of this series, as it required some time to properly carry out the technique of the operation. He had not at first found it an easy matter to throw the fluid deep into the canal. The second series of cases were operated on with an improved instrument, and he felt that they were more reliable. Of the thirteen six were cured. In two the condition was improved, so that a truss could be worn, which was impossible before the operation. The rest were failures. Dr James L. Little reported four cases with two successes. Dr Briddon reported three cases, all failures. Dr L. S. Pilcher mentioned that one of his acquaintances had been operated on for inguinal hernia by Heaton, between fifteen and twenty years ago. The result was complete relief, which had been permanent.—*N. Y. Medical Record*, Nov. 11, 1882.

From the Edin Med Journal of February 1883.

if rightly performed, the difficulty of performing it without bad consequences ought to condemn it entirely". The risk of entering the sac may be as Bryant shews a weak point in the operation, but it is questionable if the risk be not magnified. Care ought however to be exercised by the operator not to penetrate it, if possible. We have not yet as yet the complete statistics of Boston or Warren to enable us to judge of the success of the operation in their hands. But Warren considers that his cures must number about 80 per cent of his cases. The operation has many recommendations. however to induce surgeons to give it a trial. These are its simplicity, the fact that no anesthetic is

required. there being absolutely no cutting. which in itself is a recommendation to the patient, its applicability to umbilical & femoral hernia, as well as inguinal, and its safety. there being as yet no fatal cases. It would also seem to be free from the objection to other operations for the whole canal as far as the internal ring can be acted on by the irritant, and thus it may be closed entirely instead of only the lower portion. It is also claimed for it. that the effusion of lymph and subsequent consolidation is firmer, and more lasting, than that got by other operations. Last but not least if a second operation is necessary a patient will submit to it. with

greater readiness than to the more formidable ones of Wood and Spanton or the cutting one of Wm Annandale.

It has occurred to the writer that an operation directly attacking the internal ring ought to be aimed at, leaving the canal and sac to contract when they cease to be dilated. The following he thinks might answer, it may have been suggested before but not to his knowledge.

Make a vertical incision down to the transversalis muscle about two inches long, two inches external to the internal ring and the lower end one inch above Poupart's ligament. Then with the handle of the knife separate the transversalis muscle

from the internal oblique to about one inch internal to the internal ring. The last stroke of the parts will then enable you to drag them inwards, so that the incision is immediately over the internal ring. Then expose cord and sac with its covering of transversalis fascia, and having satisfied yourself that the bowel is reduced allow the muscles to take to return to their normal position.

Then by means of a curved needle bent at right angles to the shank and fitted on a handle, stitch the sac with its covering to the inner surface of the internal oblique opposite to the internal ring, or to the arched border of the transversalis above. This would cause inflammatory

exudation. which would most likely obliterate the sac, at its true neck, and fill up the internal ring without interfering with the cord. In direct hernia the neck of the sac would be stitched to the fibres of the conjoined tendon if they were pierced or to the edge of the rectus making the incision at some distance from the opening. It may be urged that there is increased risk of peritonitis by following this method. but performed under antiseptic precautions it does not appear to the writer that there is likely to be increased risk especially when contrasted with the formidable abdominal operations now successfully performed.

Also it may be said there is a risk of the remains of the sac becoming gangrenous. Mr. Chiene in operating for strangulated hernia ligatures the sac (also sewing up the canal) and he has not found it so. The abdominal wall is not weakened as the incision is removed from the position of the internal ring.

It will thus be seen that there is now good reason to recommend the more extensive performance of operation for the "Radical Cure". Especially as of late years the results are becoming more and more successful and doubtless, careful observation of cases with criticism and comparison of various operations,

may lead to the discovery of a safe and successful method of treating this one of the most troublesome ailments of humanity.

In consequence of my entering the University ~~London~~ under the old regulations, pursuing courses commenced study in 1856. and being required to read in a Thesis before my final Examination. I could not possibly prosecute any original research during the four years. I had been here. I therefore selected the subject of Hernia. being one. I had always felt deeply interested in. Herniotomy was the first operation I witnessed

over 30 years ago, and since then I have had an opportunity of examining some thousands of cases of hernia. Also in two instances I was perhaps instrumental in saving life. when I diagnosed strangulated hernia (which led to operation) in cases where the patients thought they were only suffering from Colic.

I intend if possible to make Hernia a special subject of future study

G. Moore Reid.

Edinburgh
April 2nd 1883.