ON REPEATED CÆSAREAN SECTION

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ON April 6, 1901, I performed the first Cæsarean section on Mrs. J. J., aged 27, who was in labour with her first child. She was a feeble, anæmic person, with a cachectic appearance due to syphilis. When five years of age she had suffered from hip-joint disease, which had occasioned marked pelvic deformity. The pelvic measurements were as follows :

	Inches.		Inches.
Interspinous ...	7	Conjugata vera ...	2 to 2½
Intercristal ...	8	Transverse of outlet	2
Ext. conjugate ...	6	Antero-posterior of	4
Post. Sp. II. ...	2¾	outlet ...	

The operation was carried out in the usual manner, without administration of ergot, eventration of the uterus, or compression of the broad ligaments. The anteriorly lying placenta gave no trouble, but after it had been removed, together with the membranes, the interior of the uterus was found to be lined by a layer of greenish-yellow, pulpaceous material. This was extremely tenacious, and was only stripped off with difficulty. The uterine wound was closed with deep, interrupted, chromicized catgut sutures, followed by two layers of continuous catgut sutures that included peritoneum only. The parietal wound was sutured with silkworm-gut.

At the end of a month the mother and child were discharged from hospital. The uterus lay in the pelvis, and was apparently quite movable.

Pregnancy supervened again in July, and the patient was at once placed upon anti-syphilitic treatment, from which she derived great benefit throughout the whole period of gestation. Labour set in on the morning of April 16, 1902, and the patient entered the Lying-in Hospital some hours later. On examination the abdominal scar was perfectly sound ; the fœtus lay with its back turned to the mother's right, and the transversely lying head was above the brim of the pelvis. The cervix admitted one finger ; membranes unruptured. Labour pains were strong and the cervix dilated to a

considerable extent, and the membranes gave way before the operation took place.

Assisted by my colleague, Dr. A. Stookes, I performed the second section, making the incision along the centre of the abdominal scar, which was composed of tough cicatricial tissue $\frac{3}{4}$ inch in thickness, and showed no sign of yielding.

Presently the surface of the uterus appeared, covered with normal peritoneum, over which the parietes glided with every respiration. The introduction of the right hand into the abdominal cavity confirmed the suspicion that adhesions were quite absent, and ascertained that the placental site was on the posterior wall of the uterus. On the anterior wall the position of the first incision was indicated by a faint linear depression. There was no thinning, and not even any appearance of cicatricial tissue when the incision was made through the 15 mm. thick wall. The child was extracted without difficulty, and the posteriorly attached placenta and the membranes removed. Interrupted catgut sutures were used to close the uterine wound, and the latter was then attached to the lower part of the abdominal incision by seven catgut sutures and two of silk tied tightly in order to relieve any strain on the catgut. These sutures passed through the entire thickness of the abdominal parietes of each side, and entered and emerged from the uterine wall at a distance of $\frac{1}{2}$ inch from the line of the uterine incision, whilst their loops were sunk about $\frac{1}{3}$ inch in the uterine parietes. When they were tied they not only approximated the edges of the abdominal wound, but they fixed firmly to the parietes an area of the uterine wall measuring about $3\frac{1}{2}$ inches by 1 inch. The procedure was, in short, an extensive ventro-fixation. The extreme upper and lower sutures were passed about 1 cm. beyond the extremities of the incision, in order that a repetition of the incision at a future section should not by any chance run the risk of entering the peritoneal cavity at the upper or lower limits of the utero-parietal adhesion. The remainder of the parietal wound was sutured in three layers.

There was no compression of the broad ligaments, and very little handling of the uterus, with the result that bleeding was trifling. Recovery was easy and uninterrupted. The female child was apnoëic when delivered, and did not attempt to breathe for three minutes. Its weight at birth was 6 lb. 3 ozs., and it is now a strong healthy infant.

The absence of adhesions was a matter of disappointment to me, since perusal of the experiences of W. J. Sinclair, H. R. Spencer,

A. H. F. Biggar, C. Everke, and others had led to the expectation of a more or less complete utero-parietal attachment. If, as Paul Bar declares, its absence is to be regarded as an indication of the triumph of asepsis, then the success is a matter of congratulation only when viewed from the scientific standpoint, since the condition implies for the patient an exact repetition of the risks attendant upon the first operation. But, disregarding for the time the question of the causation of adhesions, it cannot be gainsaid that their complete development under modern methods immeasurably improves the chances of success at subsequent sections. Examples of this, recently reported in England by Sinclair and Spencer, have aroused anticipations that are not altogether justified by a study of the experiences of others; for, unfortunately, in the majority of cases there are present conditions intermediate between total adhesion and total absence of it, and included in this category are instances more or less tragic in their consequences.

Few repetitions of an operation, itself infrequent, fall to the lot of any one surgeon, hence individual opinions on the subject are apt to be based on a limited number of cases. Herein lies the explanation of the diversity of opinion prevalent in Great Britain at the present time.

In July, 1900, the London Obstetrical Society¹ had under consideration the subject of Cæsarean hysterectomy for fibro-myomata, and the discussion strayed, as happens occasionally, from the limits of the subject proper into more general paths. Several members assumed an attitude of hostility towards the conservative operation in cases of permanent pelvic obstruction. Wm. Duncan stated that 'abdominal hysterectomy with intraperitoneal treatment of the stump was much less dangerous than any Cæsarean section, and he would adopt it in all cases which necessitated removal of the foetus per abdomen, the only exception being in favour of cancer of the cervix, in which he thought it safer to clamp the cervix and fix it in the lower end of the abdominal incision.' J. H. Targett considered 'that a non-sterilizing Cæsarean section was very rarely justifiable; while between a supravaginal hysterectomy and a Cæsarean section with sterilization the balance would usually be in favour of hysterectomy, because it could be more rapidly performed and prevented the risks of hæmorrhage and sepsis.'

P. Horrocks preferred sterilization by snipping half an inch out of the middle of each Fallopian tube. H. R. Spencer opposed Cæsarean hysterectomy in cases of permanent pelvic obstruction, and would have nothing to do with sterilization by tying or cutting the tubes,

as he considered the conservative section the proper operation in such circumstances.

In 1901, at a meeting of the North of England Obstetrical Society in Liverpool, W. J. Sinclair² stated that he was opposed to tying or removing the tubes with a view to sterilizing the patient, and expressed himself in favour of the conservative operation. This opinion received almost unanimous endorsement at a subsequent meeting of the same society early in the present year.³

Murdoch Cameron,⁴ at the meeting of the British Medical Association in Manchester, entered a protest against 'the appalling frequency of hysterectomy along with Cæsarean section, as advocated by some members of the London Obstetrical Society,' and stated that his usual practice was to tie and divide the tubes in order to produce sterility. At the same discussion A. L. Galabin⁴ said, 'I would urge that the time is ripe for further extension of Cæsarean section in the treatment of pelvic obstruction'; and again, 'The results now obtained justify the advice that sterilization be not carried out, except in such cases as obstruction by fibroid tumour or cancer.'

Thus, there are three different views as to the procedure to be followed:

1. Cæsarean hysterectomy—W. Duncan, J. H. Targett.
2. Cæsarean section, with resection of portions of both Fallopian tubes—P. Horrocks, Murdoch Cameron.
3. Cæsarean section without sterilization—W. J. Sinclair, H. R. Spencer, A. L. Galabin, N. Raw.

The comparative paucity of cases of the repeated operation led earlier writers to assume that diminished fertility was one of the results of the first section, an opinion supported by a case of Korn's,⁵ in which the decidua was absent over the site of the scar. Recently Franz Torggler⁶ has shown that there is no real ground for the supposition, and a study of the cases has led me to the same conclusion.

Of the cases that occur scattered throughout Obstetrical literature, some are reported too briefly to warrant their inclusion in this paper. (A list of these will be found on page 605.) In making an examination of those available, it has to be borne in mind at the outset that they divide themselves naturally into two classes:

1. Examples of the so-called 'old method,' in which the operators 'confided the closure of the uterus to nature.'
2. Cases in which the uterine wound was sutured.

Division of these two groups by a time limit would occasion

difficulties, and might incur the charge of sciolism. Since the first recorded instance of the application of uterine sutures by Lebas⁷ in 1769, the procedure had been repeated in isolated cases until the work of Kehrer and Sänger revolutionized its technique. These two surgeons published the results of their independent labours in 1882, and from that time onwards suture of the uterus became the rule. Only those cases will be considered in the reports of which occurs the definite statement of suture by modern methods.*

Study of these cases reveals the existence in the majority of intraperitoneal adhesions of varying extent; in a minority they are entirely lacking. The cases may be classified under the following heads:

I. Cases in which there is complete adhesion of the uterus to the peritoneum of the anterior abdominal wall; complete utero-parietal adhesion.

II. Cases in which the uterus has contracted adhesions with—

(a) The anterior parietal peritoneum to a varying degree; incomplete utero-parietal adhesion.

(b) *In addition*, one or more of the abdominal viscera, usually intestine or omentum, or both; utero-visceral adhesion, subdivided into utero-intestinal and utero-omental. *At least one of these forms invariably accompanies incomplete utero-parietal adhesion.*

III. Cases in which utero-visceral or parieto-visceral adhesions alone exist.

IV. Cases of slight filamentous utero-parietal adhesion.

V. Cases in which adhesions of every kind are entirely wanting.

I. COMPLETE UTERO-PARIETAL ADHESION (SEE TABLE A).

Out of a total of 8 cases, in only 3 was the utero-parietal adhesion sufficiently extensive to allow of the repeated operation being absolutely extraperitoneal. In 5 others the adhesion was defective over a small area, so that the operations cannot strictly be described as extraperitoneal.

Cases in the First Category.

1. A. H. F. Biggar found at the second operation, some six years after the first, that 'the whole length of the uterus' was entirely adherent to the abdominal wall, and that, in consequence,

* Case 25 is an exception. It is very imperfectly reported, but the condition found at the second section is so strongly in favour of the use of uterine sutures at the first that I have felt justified in including the case.

the premeditated design of sterilizing the patient could not be executed.

2. R. Olshausen, operating for the second time after an interval of seventeen months, found some thin adhesions between uterus and abdominal wall, and also between uterus, omentum, and abdominal parietes. The uterus showed no trace of the first incision. The adhesions were separated so as to allow of the eventration of the uterus. When the patient left hospital the uterus was adherent to the abdominal wall. Four years later the third operation took place, and this time the utero-parietal adhesion was complete, the whole anterior surface of the uterus being involved. This opportunity for the performance of the extra-peritoneal operation was ignored, the adhesions were separated, and the uterus eventrated. With manual compression of the broad ligaments a median fundal incision was made, and after delivery had been effected atony and post-partum hæmorrhage occurred.

3. W. J. Sinclair, five years after the first section, operated for the second time on a patient in whom there were evidences of utero-parietal adhesion. This was confirmed at the operation, for, 'on cutting through the cicatrix, the incision was found to extend at once into the muscular wall of the uterus, so that the uterine cavity was entered without opening the peritoneal cavity.' Unfortunately, when the sutures were being introduced, 'anæsthetic vomiting took place, and caused a slight tearing upwards of the wound, so that it extended a short distance into the peritoneal cavity. This was closed.' The condition necessary for the extra-peritoneal operation was present, and but for an accident beyond the control of the operator the peritoneal cavity would have remained intact, so the case is grouped with those of Biggar and Olshausen. It is to be noted that the tear occurred at the upper end of the wound, the place where utero-parietal adhesion seems apt to be defective.

Post-partum hæmorrhage occurred only in Case 2, after an operation involving considerable handling of the uterus and compression of the broad ligaments.

In two cases (Nos. 1 and 3) adhesion followed the first operation, and in one of these (Dr. Sinclair's) it was intentionally brought about by padding the abdominal wall after the operation. In Case 2 complete adhesion only resulted after the second interference, and although an extraperitoneal operation was then possible, the opportunity was not taken advantage of.

The Second Category.

This includes cases in which utero-parietal adhesion was all but complete.

4. The first operation took place in 1886, and Korn performed the second in 1887, when the cicatrix of the pendulous abdominal wall was so thinned that the silver sutures used at the first operation could be easily palpated. The incision was placed to the right of the scar. To the whole length of the latter the uterus was adherent, and in its thinned wall four silver sutures were visible. After separation of adhesions the uterus was everted. The detachment of the anteriorly situated placenta was effected with difficulty. Catgut was the suture material employed on this occasion.

At the third operation, four years later, the uterus was bound by adhesions to omentum and abdominal parietes. Its wall was very thin, one part of the cicatrix being actually transparent, so that a rupture appeared imminent. Leopold separated the adhesions, and on opening the uterus again encountered the placenta. The uterine cicatrix was excised, and the wound sutured with silk. Drainage with iodoform gauze.

5 (Olshausen). At the second section, twenty-two months subsequent to the first, the opening of the abdomen close to the old scar revealed numerous firm broad adhesions between uterus and anterior parietal peritoneum. Their separation was effected with finger and scissors. P.P.C.* caused free bleeding, despite the use of the rubber tourniquet. Catgut sutures applied. Uterus remained atonic, and bled profusely, but after removal of the tourniquet it gradually contracted. On the left border of the uterus was a peritoneal tear, 3 cm. long, caused by separation of adhesions, which required suturing.

Four and a half years later the third operation was performed, the abdominal incision (placed close to the former scars) encountering wide utero-parietal attachments, so that extensive dissection with scissors was required to expose the uterus, and even then the peritoneal cavity was only opened at the upper and lower angles of the wound. Complete separation was carried out, an omental adhesion requiring ligature; the uterus was everted and incised through the fundus and upper part of the anterior wall. The placenta was attached anteriorly, but lay below the level of the incision. After

* The letters P.P.C. (placenta prævia Cæsarea) indicate that the placenta was attached to the anterior wall of the uterus.

suturing with catgut, atony led to free hæmorrhage. The uterine peritoneum—'shaggy' by reason of the numerous shreds and tags which beset its surface—was repaired with catgut, the procedure drawing the right round ligament close to the wound. The bleeding had now ceased, but it was found that the lower sutures had partly cut through the muscular tissue, so a second layer was applied. Exact suture of the abdominal wall was not possible. The operation lasted one hour. On dismissal, the uterus lay high and was adherent.

6. C. Everke, operating on a patient for the third time, found adhesions so extensive that 'only 2 cm. of peritoneum' were opened. Beyond this statement details are lacking.

7 (J. C. McCoy). After the first operation in 1895 a utero-abdominal fistula formed in the lower angle of the wound. Through this fistula menstrual blood escaped regularly until February, 1898, when conception occurred. At the second section utero-parietal adhesion existed over an area of $2\frac{1}{2}$ inches at the site of the fistula. Adhesions also extended along the whole length of the uterine scar except for a deficiency at the fundal end. 'The adhesions completely surrounded the field of operation save at the fundus of the uterus, where they were deficient. Uniting as they did the anterior surface of the uterus to the parietal peritoneum, they made the operative field practically extraperitoneal.' The defective area above was packed with gauze, and the operation proceeded with. P.P.C. Uterus sutured with silk, and the operator then excised both ovaries and tubes.

8. H. R. Spencer operated for the first time in 1893. At the second operation in 1894 there were adhesions to the omentum and cæcum. At the third in 1900 he found that, 'owing to the adhesion of the uterus to the abdominal wall, resulting from the previous operations, the peritoneum was only slightly opened at the upper and left part of the incision.'

Adhesion occurred after the first operation in Cases 4 and 7, and after the second in Nos. 5, 6, and 8. In Nos. 6, 7, and 8 the operation was actually just short of being extraperitoneal; but in Nos. 4 and 5, although the extent of adhesion was sufficient to justify the view that the section was potentially extraperitoneal, yet actually the uterus in each case was freed from its attachments. These two cases are, therefore, classed with the lesser degree.

In Case 5, and also in Case 2, the uterus appeared to have been handled considerably during the separation of the adhesions, and, in addition, the broad ligaments were compressed manually. It is

significant that in each case atony of the uterus and post-partum hæmorrhage followed delivery.

Cases 5 and 8 illustrate the tendency of adhesions, once they have been formed, to become denser and more extensive with each repetition of the operation.

The formation of a utero-parietal fistula, as in Case 7, was formerly a not uncommon occurrence after Cæsarean section in pre-suture days. Then rupture of the uterus generally took place in such cases in subsequent pregnancies. (Cf. Schenk, *Siebold's Jour.*, bd. v., p. 783; bd. vi., p. 377.)

II. INCOMPLETE UTERO-PARIETAL ADHESION (SEE TABLE B).

9. Zweifel (1888) performed the second section some eighteen months after the first. Intestine and omentum were glued to the parietes, and omentum only to the uterus. With one exception requiring ligature and division, the adhesions were separated by the finger, and the lower part of the uterus was found directly adherent to the abdominal wall. The uterine scar was recognisable only on close inspection. The Fallopian tubes were ligatured with silk. On dismissal, the utero-parietal adhesion had recurred.

10 (Leopold). Utero-parietal adhesion occurred after the first operation in 1886. Five years later, at the second section, the uterus was found firmly adherent to the parietes and mesentery (? omentum). Ligature and division of these attachments were required before it was possible to turn the uterus out of the abdominal cavity, and the ragged surfaces left after separation necessitated drainage with iodoform gauze. Eight silver sutures used at the first operation were removed. Resection of the old uterine scar and extirpation of a right-sided parovarian cyst. On dismissal, the uterus was again adherent.

11. After the first section Krassowski's patient suffered from peritonitis for the first ten days, and as the result of this, utero-parietal adhesion was established, and at the lower part of the wound there opened a fistula six inches long, which persisted 'for some time.' The second operation, eight years later, disclosed a uterus adherent to parietes, bladder, and omentum, the parietal and omental bands being important enough to require division. The uterus showed no trace of the old incision.

12. Therese A. Barth underwent Cæsarean section four times successfully. B. S. Schultze performed the first two, and at the second ($2\frac{1}{2}$ years subsequent to the first) he found the uterus firmly adherent to the parietes, and below to the bladder; the omentum adherent to the parietes, and above the upper limit of the wound

the colon was attached. Considerable difficulty was experienced in freeing these vascular adhesions, twenty-four minutes being occupied by this alone. P.P.C. Severe post-partum hæmorrhage occurred. The old silver sutures were removed. On dismissal, recurrence of utero-parietal adhesion was found, although the corpus uteri was freely movable. Two years later Zweifel performed the third section; several utero-intestinal adhesions were present, but no mention is made of utero-parietal attachment. Three years afterwards Schultze operated for the final time; the abdominal scar was extremely thin, and from it numerous adhesions radiated to the uterus. On the latter the cicatrix was fibrous, 1 cm. wide and 3 mm. thick.

13. G. Braun operated twice—1891 and 1892—and Koffer once, in 1893. At the second section there was considerable omento-parietal adhesion, and part of the omentum was resected. Utero-parietal adhesion not mentioned. Uterus not eventrated.

At the time of the third operation the patient had a pendulous belly and a ventral hernia. The abdomen was opened between the two old scars. Omentum was adherent to both uterine and abdominal parietes, the uterus dextro-rotated 90 degrees, and fixed in this position by tough adhesions. Omentum ligatured off, divided, and the uterus eventrated. The uterine incision opened a small collection of inspissated purulent material, in which was embedded an old suture. The application of the rubber tourniquet was rendered difficult by intimate adhesion between the lower segment of the uterus, omentum, and abdominal parietes, especially on the right side, where a piece of omentum, the size of the palm of the hand, had to be resected. Porro's operation.

14. Rühle, after suturing the uterus, varied the first operation by drawing down the omentum over the anterior surface of the uterus. On the tenth day an abscess formed in the lower angle of the wound. Nearly three and a half years later, at the second section, very vascular adhesions were found uniting a coil of intestine on the one side with the uterus, on the other with anterior parietes. Two long adhesions passed from the fundus to the abdominal scar, and a broad-based one ran from the left fundal area to the thinnest part of the abdominal scar. The omentum was not adherent at all. Porro's operation.

15. The first operation was carried out by an unknown surgeon, and the sole detail concerning it is the vague history of the appearance of 'numerous small abscesses' over the abdominal wall afterwards. Subsequently a hernia developed over the symphysis pubis. Almost six years later Löhlein found at the repeated operation that a

cord-like adhesion, springing from the parietes, had by traction on the uterus rotated it on its long axis, and that the omentum was adherent to the abdominal parietes. Porro's operation.

16. H. Löhlein operated in all three cases, in 1890, 1891, and 1895. At the second section there were adhesions between the great omentum and abdominal wall, and between uterus and anterior parietes. These were readily peeled off. Fever was present from the third to the ninth day, and on dismissal from hospital the uterus was adherent to the abdominal wall. Four years later, when the abdomen was opened for the third time, about 1½ ozs. of clear fluid escaped. In the neighbourhood of the earlier scars were numerous slender adhesions between omentum and the left side of the abdominal parietes, as far down as the pelvis. They were easily separated. The linear uterine cicatrix was clearly visible. P.P.C. Deep silk, superficial catgut sutures.

17. G. H. van der Meij performed the first two operations. At the first the placenta presented through the uterine incision. 'Slight circumscribed peritonitis' followed, so it is not surprising that several strong utero-parietal adhesions were encountered at the second, two and a half years afterwards. There were no traces of the old scar or sutures on the uterus. C. N. van de Poll performed the third section six years later; the omentum was adherent to the upper part of the parietal scar, and below this there were broad utero-parietal adhesions.

Porro's operation. The abdomen had to be reopened the same evening on account of hæmorrhage from separated intestine.

18. There is no information regarding the first operation, except that silk sutures were used. G. M. Boyd, five years later, opened the abdomen at one side of the scar, and after loosening several omento-parietal adhesions found firm utero-parietal adhesion at the lower part of the incision. He did not interfere with this. There was no trace of the former uterine incision or of the sutures.

19. Hegar performed the first operation, and Sonntag the second, after an interval of seven years. Silk sutures were used on both occasions. At the second section the abdominal wall was thin, but adhesions are not mentioned. Three years later Bulius operated for the third time, and he remarks that the abdominal wall was 'right thin'; at its lower part were utero-parietal adhesions, and above, in the umbilical region, the omentum was attached. The latter required double ligaturing and dividing, and some uterine adhesions were freed with scissors; but it was then discovered that the lower part of the uterus 'was but little developed, and proportionately

thin,' so the incision was begun at the fundus and carried downwards.

Each Fallopian tube was matted to its own ovary, so double removal was carried out.

20. The first section was performed in 1891 by a surgeon unknown. Selhorst was responsible for the second in 1899. When the abdomen was opened the finger introduced ascertained utero-parietal adhesion below, but above 'all was well.' Immediate contradiction followed, for after scissors had been employed to enlarge the wound fæces promptly welled up. On closer examination several coils of intestine were discovered adherent to the parietes, and they had to be loosened before the wounded gut became accessible, when a gap involving two-thirds of the wall presented itself. This was repaired. The utero-parietal adhesions were next separated, and the operator was about to open the uterus, when his attention was attracted by a swelling on the uterine parietes to the left of the old cicatrix. It resembled 'half an egg' in appearance, and when opened proved to contain a great deal of pus in which were some well-preserved relics of the first section in the form of silk sutures. The abscess cavity was scraped, and its walls, after partial resection, sewn together. At this point the operator casually remarks that the proceedings had occupied an hour and a half! The uterine scar was recognisable as a blue stripe, it was well consolidated, and quite as thick as the rest of the uterine wall. To its right was placed the incision, which invaded the placenta, free bleeding ensuing. Post-partum hæmorrhage followed, and was treated by 'massage of the uterus.' A short length was resected from each tube, and the old abdominal scar excised.

Dr. Selhorst complains in the preface of his pamphlet that the editors of the *Nederlandsch Tijdschrift voor Geneeskunde* had repeatedly declined to publish his paper!

21. Johannovsky performed both operations, the first in 1892, after which utero-parietal adhesion took place. At the second, in 1900, the abdomen was opened a finger's breadth to the right of the scar, above the umbilicus. Extensive firm adhesions were at once encountered, for the separation of which knife and scissors were required. Figure-of-eight utero-parietal sutures were applied (see under 'Adhesions'), as Johannovsky felt some doubt regarding the condition of the uterine wound.

22. Concerning the first operation in 1895 information is lacking. Brünings performed the second in 1897, and eight days after the operation an abscess formed between the uterus and the abdominal

wall. Even after it had healed there remained a shallow depression, sometimes moist, always covered with a scab. Through this fistula a great deal of blood was discharged when the third labour commenced. On this occasion G. Wiener operated, and found the uterus firmly attached to the abdominal wall, omentum, and intestines. Porro's operation.

III. CASES IN WHICH THERE OCCURRED ADHESION BETWEEN UTERUS AND INTESTINE OR OMENTUM, OR BETWEEN ABDOMINAL PARIETES AND INTESTINE OR OMENTUM, OR IN WHICH THERE WAS A COMBINATION OF BOTH, THE UTERUS NOT BEING ATTACHED TO THE ABDOMINAL WALL (SEE TABLE C).

23. The well-known case of Frau Rittgen, who submitted to no fewer than five Cæsarean sections. Of the first, in 1875, there are no details. F. G. H. Birnbaum performed the second in 1878, when the omentum was adherent to the abdominal wall. A subperitoneal blood effusion, considered to be indicative of tearing, was present in the lower part of the uterine scar. Post-partum hæmorrhage was checked by ice placed in the uterus. The latter was closed with four catgut sutures. Drainage of the abdomen. Of the third section in 1879 no report is forthcoming, but Birnbaum performed the fourth in 1881, and had to divide the omentum from the entire length of the abdominal scar. The subperitoneal blood effusion was again in evidence, bleeding was stilled with ice as before, and catgut sutures employed to close the uterus. The final operation was done by Birnbaum also, the omentum having this time to be ligatured and divided from the uterus. On the latter the blood effusion was again visible. The plucky woman succumbed on this occasion, and the post-mortem examination disclosed general peritonitis, evidently due to leakage from the gaping uterine wound.

24. Birnbaum operated in 1882 and 1884. At the second section a coil of intestine was adherent to the abdominal wall. P.P.C. led to 'enormous hæmorrhage.' Death from septic peritonitis.

25. The patient was a dwarf, who submitted to the second section in 1890, two years after the first. Some intestines were adherent to the uterus, the wall of which was thinned. The uterine wound was not sutured! Death occurred from general peritonitis.

26. At the first operation in 1891, Staude found the placenta anteriorly attached, a condition again present at the second in 1893. The omentum adhered to the abdominal wall, the uterus being free

save for one long slender adhesion uniting it with the parietes. The scar was visible as a smooth, narrow streak.

27. The first section took place in 1891, and G. Braun performed the second two years later. The intact abdominal wall was incised near the scar under which the peritoneum was thickened. Omentum adherent to uterus over an area the size of a crown-piece was tied and divided. Examination of the uterine scar showed it to be well formed, thick, and composed of tough cicatricial tissue. P.P.C.

28. The second section was performed a year after the first by Schneider. An unusual condition presented itself in the shape of adhesion of omentum and intestine to the *posterior* wall of the uterus. The eventration of the uterus was thus rendered difficult and the application of the rubber tourniquet impossible. Manual compression was therefore resorted to. P.P.C.

At the first operation, which was carried out with the strictest aseptic precautions, the uterus had been eventrated and the rubber tourniquet employed, but the uterus appears to have been so tenderly treated that the infliction of any injury does not seem probable. There was no rise of temperature during the puerperium, but for the first eight days the patient complained of abdominal pain to which little importance was attributed. Adhesion was probably taking place then.

29. Smyly operated both times. The second operation was begun when daylight was fading, and had to be completed by lamplight. Intestines were firmly adherent to the uterine scar, and were detached with considerable difficulty. Further trouble arose with the uterine cicatrix, which was so thin that it gave way to the pressure of the thumb. The cicatricial margins offered so little raw surface that union appeared doubtful, and they were therefore split with scissors and then united with deep and superficial sutures.

The patient died on the fourth day from peritonitis, due to leakage from a small opening in the intestine, which had been overlooked.

30. Leopold operated in 1890 and 1897. During the interval diastasis of the recti muscles had taken place. At the second operation firm adhesion of the sigmoid flexure with the uterus was divided with Pacquelin's cautery. The anterior wall of the uterus was thinned and had the placenta attached to it.

31. All three operations were performed by E. Pollak, in 1896, 1897, and 1899. At the second the omentum was adherent to the uterus, especially on its left, and at the third similar adhesion existed in several places.

32. N. Raw was the operator at both sections. The second took place twenty-one months after the first, and 'the uterus was not at all adherent to the abdominal wall, although some bands of omentum were adherent to the scar.' P.P.C.

IV. CASES OF SLIGHT (FILAMENTOUS) UTERO-PARIETAL ADHESION (SEE TABLE D).

33. Olshausen found 'no important adhesions' at the second operation, two and a half years after the first.

34. The first two operations were performed by Tarnier, who makes no mention of the presence of any adhesions at the second. They were probably slight or absent, for when Paul Bar opened the abdomen for the third time, although 'sheets of fibrous tissue completely masked the uterus,' they were easily broken down, and formed a complication of no importance. The uterine wall was so thin that the ovum threatened to burst its way through.

35. Paul Bar operated on three occasions—1894, 1896, 1897. The uterus was sutured with silk each time. Weak adhesions, easily separated by the finger, were found at the second section, and again at the third. This time the uterine wall was extremely thinned, and a hernia ovi appeared imminent.

36. Schauta performed the second section two and a half years after the first. The uterine cicatrix was covered by a 'pseudo-membrane,' which spread out in a fan shape to the abdominal parietes.

The filamentous adhesions in these cases appear from the descriptions to have been thin and delicate—mere cobwebs, which offered no difficulty of any kind, so that each repetition of the operation was a simple conservative section.

In Cases 37 to 43 (inclusive) there were no adhesions.

CASE OF REPEATED SECTION AFTER POSTERIOR (MEDIAN) INCISION OF UTERUS (SEE TABLE F).

44. This is the only instance of a second section after the deliberate performance of posterior median incision. Sippel, who was responsible for the latter, maintains that it is impossible to suture accurately a uterine wound which involves the placental site. Therefore, after diagnosing the position of the latter, he places the incision so as to avoid it, and accordingly, at the first section in 1898, the posterior wall of the eventrated uterus was incised along the middle line. The wound was closed with continuous catgut sutures.

Fifteen months later, E. Petersen opened the abdomen to the left of the scar, and found a cord-like adhesion running to the anterior parietes. This was divided and the uterus eventrated, when similar adhesions were discovered uniting small intestine to the cicatrix on the posterior wall of the uterus. The placenta was attached anteriorly, so the 'Fundalschnitt' was carried out at the cost of considerable hæmorrhage. When the patient was dismissed from hospital, the high-lying, anteflexed uterus was adherent to the lower third of the abdominal cicatrix.

CASES OF REPEATED 'FUNDALSCHNITT' (SEE TABLE G).

45. Both operations were performed by Fritsch. After the first, in 1897, the uterus lay freely movable in the pelvis. At the second, in 1899, the abdomen was opened to the left of the scar. Omentum adhered to the right extremity of the uterine cicatrix (the only portion of the latter that was recognisable) and to the fundal area behind this. It was tied, divided, and the uterus opened. Examination failed to demonstrate the presence of cicatricial tissue in, or thinning of, the fundus. The after-history of the case is interesting. Progress was normal until the eleventh day, when the sutures were removed from the primarily united wound. From the thirteenth day onwards slight evening rises of temperature were noticed, and the lochia became profuse and offensive, and on the fifteenth day suppuration of a stitch-track at the lower part of the wound was present. Whilst the uterus was being washed out with lysol some of the solution was observed to be escaping through the suppurating stitch-track, so the douching was at once discontinued. Later, several silk sutures came away, both *per vaginam* and through the fistula. Gradually all disturbance disappeared, the fistula diminished to 2 cm. in length, and the patient was transferred to the Poliklinik as an out-patient. The fistula healed up, only to break out again to give exit to more sutures, so the patient re-entered hospital. On April 17 a probe passed 5 cm. along the fistula, to the neighbourhood of which the uterus seemed firmly fixed. After dilatation by means of laminaria tents, a panelectroscopic examination of the fistula revealed the presence of a buried suture, but attempts to remove it failed. Under anæsthesia, the fistula was scraped and sutured, but, as it broke down again, Fritsch resolved to excise it, and at the same time free the adherent uterus. This was done on May 14. Tough, thick, cicatricial masses united the uterus to the abdominal parietes around the whole circumference of the fistula and its neighbourhood. Two coils of

small intestine were adherent to the fundal area behind the scar and to the posterior uterine wall. Scissors had to be employed to free these adhesions, and in the process injuries were inflicted on the intestinal serosa, which necessitated careful suturing, whilst the raw surfaces left on the uterus required touching with Pacquelin's cautery in order to check the oozing of blood from them.

The patient died on the fourth day from general peritonitis.

46. At the first operation, in 1898, R. Hlawacek discovered, after replacing the sutured uterus in the abdomen, that two coils of intestine were adherent to the abdominal parietes above the upper limit of the incision. R. Ludwig performed the second section in 1899, the abdomen being opened along the line of the perfectly intact scar. Omento-parietal adhesions were found at the upper end of the incision, and a small part of the omentum was attached to the sites of the silk sutures beside the scarcely recognisable uterine scar. Separation was effected without difficulty, 'Fundalschnitt' repeated, the placenta presenting through the incision. The uterine cicatrix was $1\frac{1}{2}$ cm. in thickness, and had not yielded in the slightest.

It is interesting to note that in both cases (45 and 46) of repeated 'Fundalschnitt' the uterus acquired adhesion to omentum alone after the first operation. But in Case 45, and also in Case 44 (in which the 'Fundalschnitt' was performed at the second section), the repeated operations were followed by extensive utero-parietal adhesion.

Perusal of the foregoing cases suggests many points that call for more extended consideration, but the scope of this paper is limited mainly to those bearing on the important subject of adhesion.

It is evident that in the majority of cases there are formed adhesions whose development it is beyond the power of the surgeon to prevent, and whose extent it is impossible for him to control. It is also evident that these adhesions may seriously complicate the repeated operation, or reduce it to one of extreme simplicity. The attention is arrested by the ease and safety with which the repeated operation may be carried out when performed extraperitoneally, as compared with cases in which less extensive adhesion necessitates laparotomy. The former condition, however, is by no means a modern one.

The old operation, when the patient recovered, left her with utero-parietal adhesion, either of an extensive nature and sometimes associated with fistula, or limited to the line of the wound. The operators themselves practically, though unintentionally, connived at the occurrence of this adhesion by placing in the lower angle of the wound *sindons* or *bourdonnets*, along which the secretions of the

uterus and the wound found their way, or, in default of such a drain, became encapsuled as abscesses between uterus and abdominal wall. In fact, it was as though recovery depended on the occurrence of adhesion. One observer, at least, accepted this hint from Nature—G. A. Michaelis^s of Kiel. This surgeon performed the third and fourth Cæsarean sections on Frau Adametz, and his description of the fourth operation, in 1836, is worth quoting :

‘I had already expressed in my treatise that the most favourable condition possible for the repeated operation was when the abdominal wall was found adherent to the uterus to such an extent that the incision fell within the limits of the adhesions ; I thought that this might be the case with Adametz. The advantages which such an incision holds out, with which the peritoneal cavity is not opened at all, are too evident to require further exposition. Prolapse of intestines, entrance of blood and pus into the peritoneal cavity, would then be impossible, and the only disadvantage to be feared would be that the contracting uterus would hold open the abdominal wound and hinder its rapid closure. I was therefore firmly resolved to investigate carefully beforehand in what directions such adhesions existed and where to make the incision, in the which resolution Professor Busch of Berlin strengthened me with his most kindly advice. However, the examination afforded no satisfactory information, as accurate investigation was not admissible on account of the tenderness of the scar ; and even after the onset of the pains had led to the contraction of the uterus, the skin was wrinkled in only three places, which I had already earlier recognised and noted as adherent ; between them the skin was movable over the hard, contracted uterus. I therefore designed the site of the incision in such a manner that it coursed near all three adherent patches, since these isolated points only promised partially the advantage of adhesion, which I had expected to find developed to its full extent. The incision was placed to the left of the middle line, and ran obliquely from above and externally downwards and internally, crossing the second and third scars at an acute angle. The incision was 5 inches in length. Two strokes of the knife divided completely the one and a half lines thick abdominal wall, and the third stroke entered the substance of the uterus, in which two large veins bled profusely. The peritoneal cavity appeared unopened, since the uterus was completely adherent to the abdominal wall.’

After delivery of child and secundines, Michaelis goes on : ‘Thereupon I examined the adhesions to the abdominal wall, and found them so intimate below that a square inch of the external skin

formed, as it were, the outer surface of the uterus. In other places, however, it (the adhesion) was only effected by a loose extensible cellular tissue which completely surrounded the wound without interruption. I could not recognise former scars of the uterus on its inner surface by touch. The anterior wall appeared of varying thickness in different places, internally uneven, yet completely cicatrized. That the placenta had covered this surface was an unfavourable circumstance for this investigation, by reason of the loose, uneven surface left after its detachment.'

The successful issue of the operation justified the views expressed by this acute observer—views which were speedily forgotten even by contemporary operators. Their successors of later generations had to deal with uteri which had been carefully sutured at previous sections, and with the introduction of the accurate uterine suture there came a change in the significance of utero-parietal adhesion. Once a desideratum, it came to be regarded as a complication that might, and did, lead to disaster.

I have collected from European and American literature 96 cases of the repeated operation. Of this number, 28 belong to the period when the 'old method' was in vogue, so that only 68 are instances of the modern operation. To the literature of 5 of these I have not been able to obtain access, 2 others are examples of repeated 'Fundalschnitt,' and in another the uterus was opened by a posterior incision at the first operation.

Cases in which the uterus was not sutured	...	...	28
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Modern cases :

1. Cases more or less fully reported	...	...	60
2. Repeated 'Fundalschnitt'	...	...	2
3. Case of posterior incision of uterus	...		1
4. Cases literature of which is inaccessible	...		5
			— 68
Total of all cases	...	...	96

Taking into consideration the 60 modern cases, Cæsarean section was performed twice in each of 43 cases, three times in each of 15 cases, four times in 1 case, five times in 1 case.

Examples of the 'old method' give the following numbers: Twice in each of 15 cases, three times in 2 cases, four times in 2 cases.

Altogether, there are 58 instances of two repetitions each, 17 of three repetitions each, 3 of four each, and 1 of five.

In the reports of 17 out of the 60 modern cases no mention was made of the presence or absence of adhesions of any kind. Thus, but 43 are left for analysis. As I indicated in the earlier part of the paper, these cases may be arranged into five groups, according to the variety and extent of the adhesions present. The number of cases and percentages in each class are tabulated below :

Table.	Varieties.	Number of Cases.	Per- centages.	Mor- tality.	Per- centage.
A.	1. Complete utero-parietal adhesion	3	6'9	0	9'30
B.	2. " " " " "	5	11'62	0	
C.	Incomplete " " " "	14	32'55	0	
D.	Utero-visceral adhesion ..	10	23'25	4	
E.	Slight utero-parietal adhesion ...	4	9'30	0	
	Adhesions absent	7	16'28	0	
		43	—	4	
	Cases in which adhesions are not mentioned	17	—	0	
		60		4	

The extent of adhesion in the cases in Group D was so slight that for clinical purposes these 4 cases may be classed with those in which adhesion was entirely absent, the two together representing 25'38 per cent. of all cases. In the remainder, almost 75 per cent., marked adhesions existed. In the former, no deaths occurred ; in the latter, 4 patients died, a mortality of 9'30 per cent., or, including only cases of adhesion (36), of 11'11 per cent.

Further investigation shows that the presence of any marked form of adhesion, except the complete utero-parietal, tends to render repeated sections more formidable for the following reasons :

1. Their separation increases the duration of the operation (*cf.* Case 12, in which the duration of the second operation was lengthened by twenty-four minutes, spent solely in freeing adhesions). Further time may be lost in repairing areas denuded of peritoneum by separation of adhesions. Surgical shock is thus intensified.

2. Their separation may cause serious hæmorrhage.

3. The handling of the uterus during the separation of adhesions appears in some cases to favour the occurrence of atonia uteri and post-partum hæmorrhage.

4. Injury to intestine :

(a) Actual perforation, with fatal result directly due to this traumatism, as in Case 29.

(b) Bleeding from separated intestine, which may necessitate the reopening of the abdomen, as in Case 17.

(c) Direct wounding of adherent gut, as in Case 20.

5. Rotation of the uterus, illustrated by Cases 13 and 15. In the former, rotation was permanently maintained by adhesions, and its possibility should be borne in mind in cases of utero-parietal adhesion, otherwise the incision may be placed close to, or even involve, the broad ligament.

In the face of difficulties and dangers such as these, it is not surprising that the majority of operators have hitherto regarded adhesions with strong disfavour, and have endeavoured to solve the riddle of their prevention. Torggler⁶ recommended the use of silver wire sutures as being least likely to cause adhesions, but Korn declares that silver wire promotes their development, and urges the advantages of catgut and silk. Subsequent experience has shown that the material of which the sutures are composed is a matter of indifference. Döderlein tried the application of iodoform collodion over the uterine wound, but with negative results. Rühle⁹ spread the omentum over the whole anterior surface of the uterus without success. Buckley³ suggested pushing the omentum behind the uterus, in order to prevent utero-omental adhesion. N. Raw³ stated that he had tried this, but the omentum would not remain where it was placed.

Paul Bar¹⁰ considers that the formation of adhesions signalizes defective asepsis, and holds that as technique becomes more perfect the risks of adhesion will diminish. With reference to this view of the matter, it is not possible to affirm that intraperitoneal adhesion is invariably due to sepsis. Mere mechanical or chemical irritation or injury suffices to provoke its formation. Professor Sherrington informs me that during the course of some experiments, carried out in conjunction with Mr. Ballance, thin cover-glasses introduced into the peritoneal cavity always became 'shrouded in filmy adhesions,' which neither of the experimenters regarded as the result of sepsis. Some years ago, I performed a series of experiments on the effects of introducing various sterile substances into peritoneal cavities, and all of them, without exception, were at once enveloped in lymph. Sterilized glass beads, glass marbles, pieces of metal, cork, lamp-black, all shared the fate of prompt capture. The presence of sterile silk or catgut sutures within the peritoneal cavity must provoke the same effusion, and to this effused lymph probably any peritoneal surface in contact with it becomes adherent. In the same manner, destruction of peritoneal endothelium by handling, or drying, or rubbing with iodoform or sublimate solution, results in a wound to which any adjacent peritoneal surface may adhere. Many a woman whose convalescence after her first section has progressed in a

typically aseptic manner has presented marked intraperitoneal adhesions at the second operation. These cannot be attributed to sepsis, but rather to the presence of sutures and to traumatism inflicted upon the peritoneum during the operation.

There have been operators, however, who, far from discouraging utero-parietal adhesion, have endeavoured to bring it about, although not always with the same end in view.

Pillore¹¹ (1854), in order to prevent the escape of lochial discharge into the peritoneal cavity, sewed the edges of the uterine wound to those of the lower third of the abdominal incision, the upper two-thirds of the latter being closed entirely. He states that he used this method 'with result,' and that the lochia drained away through the utero-parietal fistula. He convinced himself on the deaths of women who had long before undergone Cæsarean section that the utero-parietal union was complete, but he makes in addition the curious statement, 'A repeated operation, in spite of the adhesions, could not be made.'

Bayer¹² suggested a procedure very similar to Pillore's, but did not put it into execution.

Ed. Martin¹³ (1864), at the Berlin Obstetrical Society, suggested the revival of Pillore's procedure, which had apparently fallen into disuse. He emphasized the necessity for fixing the uterus as low down as possible, in order to prevent the risk of subsequent tearing; but at the same time he states that in cases of formation of adhesions spontaneously no evidence of such tearing has even been found. The uterus comes to lie somewhat higher than usual, and 'the increase caused by subsequent pregnancy involves chiefly the fundus and posterior wall.' The proposal was received with the same disfavour as that accorded to Pillore's paper, and Martin did not himself carry the suggestion into execution.

Gius Testa¹⁴ (1867) put forth the curious proposal that the uterus should be skewered to the abdominal wound by means of a peg or pin passed through both structures (as one would pin two pieces of paper together), thus fixing the two wounds in apposition. The proposition remained in the theoretical stage.

Dusart¹⁵ published from the manuscript of Lestocquoy, eight years after the latter had performed the operation, an account of the method employed. The abdomen was opened and the uterus carefully incised without injuring the ovum. The uterine peritoneum was then sewn to that of the abdominal wall by means of five sutures on each side. This allowed the liquor amnii to flow away after rupture of the membranes, without any finding its way into the

peritoneal cavity, and the foetus was then extracted. The opening was not closed, and the lochia drained away through it. On the fortieth day the wound was completely healed.

Tarnier employed this method, but his patient died.

J. Braxton Hicks¹⁶ had trouble with bleeding in a case of Cæsarean section, so 'passed the needle armed with silver wire completely through the wall (of the uterus) about a quarter of an inch from the margin of the incision, and brought it out again about half an inch lower down, thus enclosing the opening (of the bleeding vessel). After finding that the hæmorrhage had quite ceased from other parts, the wires were carried from within through the abdominal parietes, and then fastened with those of the opposite side. To make a more complete apposition another suture, an inch lower down, was passed through uterus and abdominal walls, and brought together as usual. Elsewhere, the abdominal parietes only were transfixed.'

This procedure was the application of a proposal already previously made by the operator, and it was successful in preventing any lochial discharge from finding its way into the peritoneal cavity. The patient, however, had been in labour for a very long time before Dr. Hicks saw her, and she succumbed in three and a quarter days. The post-mortem examination 'showed healthy plastic peritonitis in the neighbourhood of the wound, which on its skin side was uniting.' 'No extravasation into the peritoneal cavity had occurred, notwithstanding that the sickness had been so severe as to drive a small portion of the omentum through the upper angle of the parietal wound.'

Robert Barnes¹⁷ suggested the employment of figure-of-eight sutures for simultaneously closing the uterine and parietal wounds, and bringing both into close apposition with each other. He devised an ingenious system of sutures, but his method does not seem to have been put into execution.

Frank¹⁸ of Cologne everted the uterus, and dissected it out from the vesico-uterine fossa. The upper parts of the round ligaments were then sewn to the anterior abdominal wall, and their lower portions to the parietal peritoneum. A kind of 'tent' was thus formed—an ante-uterine cavity—into which both the abdominal and uterine wounds opened. The uterine wound was partially closed, a drain passing into it through the abdominal opening and thence out by the vagina. A second drain passed behind the bladder into the anterior vaginal fornix, and a third led from the ante-uterine cavity externally. The patient died in ten hours. Commenting on this

case, Kehrer remarks that in his opinion the method seemed to be the one that offered the greatest chances of recovery. Kehrer's¹⁹ own method of opening the uterus consisted in incising it transversely around the circumference of the internal os. Theoretically, the only organ that could become adherent to such a wound would be the bladder, and for that reason the incision seems especially adapted for the prevention of utero-parietal or utero-intestinal adhesions. It was not generally adopted, however, and Kehrer himself operated but twice in this manner, with a fatal result in one case. In order to obtain utero-parietal adhesion he energetically washed the anterior wall of the uterus with 1 in 1,000 sublimate solution.

A. V. Johannovsky²⁰ employed in a case of repeated Cæsarean section a form of utero-parietal suture very similar to the figure-of-eight suggested by Robert Barnes. Five or six silkworm-gut sutures were introduced through the edges of the uterine wound, but left untied. The left-sided ends were passed through the right edge of the abdominal wound, and the right-sided ones through the left edge, so that a series of figure-of-eight sutures resulted when the ends were tightened, and the uterus was thus fixed firmly to the abdominal wall. Johannovsky made use of this method of suture because he was not satisfied with the condition of the uterine wound in his patient, and also because raw surfaces were left on the anterior wall of the uterus where adhesions had been separated. As he points out, even if the uterus had not been attached to the parietes, adhesions would have formed in the situations of these raw places. Nevertheless, he does not approve of such a method of suture, and would limit its application to cases in which the uterine wound is not thoroughly clean and normal.

W. J. Sinclair² endeavours to bring about utero-parietal adhesion by the application of pressure. He 'found that adhesion to the abdominal wall was the usual condition after Cæsarean section, and preferred to take measures to favour this adhesion by padding the abdominal wall, so leaving the uterus in a state of ventro-fixation.' Dr. Sinclair informs me that he rubs the uterine peritoneum with iodoform before closing the abdomen, in order to favour adhesion.

In the case I have related I carried out direct utero-parietal suture of the *already sutured uterus*, my chief object being to ensure such adhesion of the uterus to the abdominal wall as would permit, in the event of another conception, of the termination of the pregnancy by an extraperitoneal Cæsarean section. By the procedure I hoped also to prevent the formation of adhesions between uterus or

abdominal wall and other abdominal viscera. The fixation of the two wounds in close apposition, and the approximation of the whole anterior uterine surface to the parietes resulting from this suture, should preclude either intestine or omentum from contracting attachments to surfaces which clinical experience teaches are those most prone to acquire them. It might be urged that the upper portion of the parietal wound, not being in contact with the uterus, would possibly offer a site for omental or intestinal adhesion. This portion of the abdominal wall was sutured in three layers, and it is not likely that careful closure of the peritoneum would leave any area which could contract adhesion with an abdominal viscus. Even though this did occur, it would be above the zone of utero-parietal attachment, and should, theoretically, not interfere with a subsequent section.

I repeated this procedure in a case operated upon in August of this year, and the uterus still remains in its high position, firmly adherent to the abdominal wall. In another case, operated on a week ago, I adopted the method, employed by Professor Sinclair, of padding the abdominal wall. I took the precaution of steadying the two wounds in apposition, however, by placing three silkworm-gut sutures, one in the centre and one a centimetre beyond each extremity of the uterine wound. These steadying sutures were passed before the closure of the parietal wound was commenced, and were not tightened until the latter had been sutured in three layers. In this manner I obtained exact apposition, and also the undoubted advantage of triple suture of the abdominal wall. It is of importance that this form of suturing the parietes should be carried out if possible, because frequent repetition of Cæsarean section has hitherto led to ventral hernia in many cases. Dr. J. E. Burton, my senior colleague at the Hospital for Women, still further modified the method of utero-parietal suture in a case on which he operated recently. He sewed peritoneum only to the uterine wound, and then closed separately the fascial and skin layers of the parietes.

THE CHANGES THAT OCCUR IN UTERO-PARIETAL ADHESIONS, AND THEIR EFFECT ON THE POSITION OF THE UTERUS.

This is a point of considerable importance, since the objection might be urged against induced utero-parietal adhesion that it is transitory in its nature, and that we have no means of ensuring a permanent attachment. It is known that many intraperitoneal adhesions tend to disappear, and that others persist; but what determines disappearance or persistence is not known. The records

of the after-history of cases of Cæsarean section are too incomplete to assist in solving the question, confined as they are to the bare statement that on the dismissal of the patient from hospital 'the uterus was anteflexed, adherent to the abdominal wall, and' more or less 'movable.' The position is in some cases stated to be 'high.'

In the writer's case the corpus uteri remained in the abdomen, attached closely to the parietes, for about two months, and it then gradually descended, until the uterus had arrived at its usual level. Gravity, alternate distension and emptying of the bladder, and 'intra-abdominal pressure' led to the stretching and elongation of the adhesion, until it probably resembled an exaggerated urachal fold, or an inverted model, on a smaller scale, of the falciform ligament of the liver.

Some eighteen months ago I performed Cæsarean section in a woman whose flattened pelvis (Cv. = $2\frac{1}{2}$ inches) was roofed over by a large intraligamentous fibromyoma. The patient was an elderly primigravida, and in such ill-health that Cæsarean hysterectomy was out of the question. Six months later the myomatous uterus was successfully removed by supravaginal amputation. Its size was such as to compel a permanent position in the abdomen. The incision was purposely placed so as to allow of a view of any possibly existing adhesions being obtained, and when the abdominal wall was drawn away from the uterus three lines of adhesions became visible. They were arranged like an arrow-head diagrammatically represented, and were about $\frac{3}{4}$ inch in antero-posterior measurement, and varied from 1 inch to $1\frac{1}{2}$ inches in length. They were thin, being thickest at their upper edges, which presented concavities superiorly. Neither intestine nor omentum was adherent to uterus or parietes.

In this case adhesion resulted from the continued approximation of the two wounds by the pressure of the usual dressings and abdominal bandage—the method employed by Professor Sinclair to obtain ventro-fixation. Subsequently the movements of the abdominal parietes led to lengthening of the antero-posterior diameter, just as involution of the uterus caused vertical diminution of the adhesions. This case shows clearly enough that mere continued approximation of the two wounds is sufficient to lead to utero-parietal adhesion; and also that, as the uterine and parietal surfaces adjacent to the wounds are approximated as well, both intestine and omentum are prevented from acquiring attachments which might complicate future operations.

It is not possible to pass beyond theory in considering the changes that occur in utero-parietal adhesion with the advent of another pregnancy. Probably the enlarging uterus opens up the lateral boundaries of the band, and, growing in between them, again comes into contact with the connective tissue of the parietes. Whether this area of contact is as extensive as it was immediately after the preceding section is open to question ; but in some cases, at any rate, its range is sufficient to allow of the incision falling within its limits. A case reported by Rapin²¹ favours the probability of this occurrence. The patient, who had a deformed pelvis, underwent ventro-fixation of the unimpregnated uterus for retroflexion. A year later she became pregnant, and the pelvic deformity necessitated Cæsarean section. It was recognised that the uterus was adherent, and the incision, made through the scar of the previous operation, opened the uterus without encountering peritoneum. It was enlarged, and only in its lower angle was the peritoneal cavity entered. The woman made a good recovery.

The duration of utero-parietal adhesion can be estimated to some extent by an investigation of the table on p. 582, in which are represented the intervals between consecutive sections in all cases of the varying forms of adhesions.

From a study of this table it will be recognised that the limits of the existence of adhesions have in no case been reached. The majority of repeated sections take place before the eighth year, and yet of the four cases tabulated in the eighth column—

No. 11 showed strong adhesions (requiring division) between uterus and parietes and omentum.

No. 17, broad utero-parietal adhesions.

No. 20, adhesion of the lower part of the uterus to the parietes.

No. 21, 'extensive, firm adhesion' was encountered.

The conclusion indicated by these facts is further supported by the condition found post-mortem in two of the 'old' cases. Fulda²² in 1823 performed Cæsarean section on a woman for contracted pelvis. She died in 1847 of pneumonia, and Fulda had the opportunity of making the post-mortem examination. This disclosed the persistence of utero-parietal adhesion during the whole period which had elapsed since the operation. The other case was that of a woman aged twenty-eight, upon whom William Gibson²³ operated twice. She died forty-four years later, and at the autopsy utero-parietal adhesion was still well marked.

INTERVALS BETWEEN CONSECUTIVE CÆSAREAN SECTIONS.

(Numbers denote cases in tables. Roman numerals indicate years.)

Variety of Adhesion.	I.	II.	III.	IV.	V.	VI.	VII.	VIII.
A and B. Utero-parietal (31 sections).	2	5	2	4	1	8	19	11
	4	5	7	16	10	8	—	17
	8	12	14	22	18	19	—	20
	9	12	19	—	—	15	—	21
	13	12						
	13	17						
	16							
	22							
	8	6	4	3	3	2	1	4
	25·8%	19·3%	12·92%	9·6%	9·6%	6·4%	3·2%	12·9%
C. Utero - visceral (12 sections).	23	24	23	—	—	—	30	
	28	25	23					
	30	26						
	31	27						
	—	31						
	4	5	2	—	—	—	1	
	33·3%	41·65%	16·66%	—	—	—	8·33%	
D. Slight utero-parietal (4 sections).	35	33						
	—	35						
	—	36						
	1	3						
	25%	75%						
E. No adhesions (7 sections).	43	38	41	37				
	—	38	—	40				
	—	39						
	1	3	1	2				
	14·2%	42·8%	14·2%	28·4%				

The repetition of a number indicates that in that particular case there were three or even four sections.

There is, therefore, no ground for regarding utero-parietal adhesion as merely a transient condition, but, on the contrary, the evidence is in favour of its stability.

THE EFFECT OF THIRD AND FOURTH REPETITIONS OF CÆSAREAN SECTION IN RELATION TO ADHESIONS.

The number of cases is too small, and the data obtainable from the average reports of them are too imperfect, to justify more than the statement that, when adhesions are present at the second section, it is tolerably certain that they will be found

at each succeeding operation in—if they vary at all—a slightly more marked degree. This is shown in the table below.

TABLE SHOWING DEGREE OF ADHESION AT SUCCESSIVE OPERATIONS.

	Case.	DEGREE OF ADHESION IN			
		Second Operation.	Third Operation.	Fourth Operation.	Fifth Operation.
Table A.	2	Incomplete utero-parietal.	Complete.	Incomplete utero-parietal.	
	4	Almost complete utero-parietal.	Utero-parietal, more marked.		
	5	Almost complete utero-parietal.	Complete utero-parietal.		
	6	?	Almost complete utero-parietal.		
Table B.	8	Utero-visceral.	Complete utero-parietal.	Incomplete utero-parietal.	
	12	Incomplete utero-parietal.	Utero-visceral.		
	13	Utero-visceral.	Incomplete utero-parietal.		
	16	Incomplete utero-parietal.	Incomplete utero-parietal.		
	17	Incomplete utero-parietal.	Incomplete utero-parietal, more marked.		
	19	?	Incomplete utero-parietal.		
Table C.	22	?	Incomplete utero-parietal.	Parieto-omental.	Utero-omental.
	23	Parieto-omental.	?		
	31	Utero-omental.	More marked utero-omental.		
Table D.	34	?	Slight utero-parietal.		
	35	'Weak adhesion.'	'Very slight adhesion.'		
Table E.	38	?	No adhesions.		
	40	No adhesions.	?		

Complete utero-parietal adhesion has the unimportant disadvantage that it throws some difficulty in the way of diagnosis of the placental site before the opening of the uterus. To know precisely where the placenta is attached may add to the comfort of mind of the operator, but the knowledge is not essential. In the presence of utero-parietal adhesion an anterior placental attachment may be signalized, as W. J. Sinclair has pointed out, by the unusual development of veins in the uterine wall.

The occurrence of atony of the uterus and hæmorrhage might at first sight appear a formidable complication in cases of utero-parietal adhesion, but even if they occurred, the bleeding would be at least as much under control as it is in a labour terminated *per vaginam*. The same remedies could be employed: compression of the uterus, injection of sterile hot water through the wound, or even of adrenalin solution, and, if necessary, the uterine cavity could be packed very readily through the wound.

THE EFFECT OF REPEATED CÆSAREAN SECTION ON FERTILITY.

The earlier operators, almost without exception, considered that diminution in fertility resulted. This opinion, however, seems to have been based merely on impressions, for, with the exception of Torggler, no writer has dealt with actual facts.

The only series of cases available for estimating the percentage of recurrences of pregnancy after Cæsarean section is that published in 1898 by Leopold and Haake²⁴, taken in conjunction with the earlier series of Leopold's cases tabulated by Cörner²⁵. These tables include 100 operations, of which 72 were examples of the conservative section. Of these, 29 were instances of repeated section, performed on thirteen women, of whom three underwent the first operation at other clinics. This gives a percentage recurrence of pregnancy of about 22, an estimate which can only be considered a relative one, by reason of the small number of cases on which it is based.

Why more women do not present themselves for the repeated operation is explained on four grounds :

1. The mortality of the first operation.
2. Sterilization by the operator.
3. In a certain number of cases subsequent pregnancies are interrupted, lawfully or otherwise, by the induction of abortion or premature labour.
4. The first operation conveys to the patient a sharp intimation of the danger of further child-bearing, and this may lead to an improvement in the morality of the single woman, and possibly to the adoption of preventive measures by the wife.

The table on p. 582 contains 51 instances of repeated section : of these 28 were single, 7 double, and 4 triple repetitions. The intervals that separated each operation from the preceding one are shown below :

Years.	Cases.	Per Cent.	Years.	Cases.	Per Cent.
1 ...	14 ...	25·9	5 ...	3 ...	5·5
2 ...	17 ...	31·48	6 ...	2 ...	3·7
3 ...	5 ...	9·25	7 ...	1 ...	1·8
4 ...	5 ...	9·25	8 ...	4 ...	7·4

THE RELATION OF RUPTURE OF THE UTERUS TO CONSERVATIVE CÆSAREAN SECTION.

During the period from which the 18 cases of the 'old method' have been collected, there occurred 24 instances of rupture of the

uterus during pregnancies subsequent to the conservative operation. Krukenberg²⁶ relates these in detail, and classifies them thus :

1. Fifteen cases of rupture through the scar, with escape of the foetus in the peritoneal cavity. Six died.
2. Five cases in which the scar only partially gave way, so that the foetus remained *in utero*. Four died.
3. Three cases in which the tear was not in the scar, but twice in the posterior wall and once in the anterior wall. One died.
4. One case of rupture through parts adjacent to the old scar. Death.

I have met with only five cases of rupture of the uterus during the modern period, and in but one instance is a full report given. This case was published by G. Woyer²⁷. Cæsarean section was performed by Chrobak in 1893, when the uterus was closed with deep and superficial silk sutures. During the next pregnancy the woman noticed that her abdomen was bigger than usual. Rupture occurred at the beginning of labour, and on the patient's arrival at hospital, the abdomen was at once opened. One intact ovum lay in the right iliac fossa, and the second, also intact, lay under the left costal arch. Death took place on the same evening. Examination of the uterus showed that the wound of the first section had failed to unite throughout the entire thickness of the wall ; in fact, its site was marked merely by a recess covered by peritoneum and lined with decidua. Apparently, the muscular layer had never united at all, and Woyer believes that in spite of the uninterrupted course of the convalescence after the first operation, the wound had consolidated badly. He considers it a strained hypothesis that would explain the rupture by the growth of the decidua into the scar during the later stages of pregnancy. The latter, if true, would introduce a new and hitherto undreamt of danger to the Cæsarean operator.

J. H. Targett,²⁸ in 1900, showed a specimen of rupture of the uterus following Cæsarean section before the London Obstetrical Society. In this case there was some discussion as to the exact site of the tear.

At the same meeting P. Horrocks related another instance of rupture following Cæsarean section.

Everke²⁹ reported a case in which at the first operation the uterus had been sutured with silk. Rupture occurred through the scar.

A. L. Galabin³⁰ mentions another instance. Seven days before admission the patient was attacked with sudden pains and collapse, and signs of internal hæmorrhage, at the full term of preg-

nancy. At the previous Cæsarean section the tubes had been tied with fishing gut.

In my tables there are four cases in which the wall of the uterus was 'thinned':

Case 12, at the fourth operation (thickness 3 mm.).

Case 25, at the second operation.

Case 29, at the second operation (so thin that pressure of thumb caused the wall to give way).

Case 41, at the second operation.

In three cases rupture appeared imminent at the time of operation: Cases 4, 34, 35; in each instance at the third operation. In Case 23 there appeared at each operation a remarkable 'subperitoneal blood effusion,' situated at the lower end of the uterine scar. F. G. H. Birnbaum attributed it to the occurrence of tearing, but does not state whether he found that actual tearing had taken place. L. Winckel³¹, in 1849, described a case in which at the second section he found on the wall of the uterus around the old scar a number of 'considerable grape-like varicosities.' Stolz³² of Strasburg, at a second section, found on each side of the scar a cyst of the size of a fist. In all probability the subperitoneal blood effusion was due to subperitoneal rupture of varicose veins, and was not dependent upon commencing rupture of the uterus.

G. Woyer (*loc. cit.*) mentions another case which shows how even a thinned uterine wall can withstand the tension produced by labour pains. In this case a Cæsarean section had been performed by C. von Braun five years previously. The following labour had lasted for eighteen hours before the patient was brought into the clinic. By that time the child was dead, and therefore embryotomy was carried out. After extraction, Woyer took the opportunity to introduce his hand into the uterus in order to examine the scar. The lower two-thirds of it were well consolidated, but the upper third was represented by a depression $1\frac{1}{2}$ cm. in length and 1 cm. deep. By bimanual examination the thickness of the wall at this point was estimated to be 3 to 4 mm.

Utero-parietal fistulæ occurred in four cases:

Case 7, after the first operation; persisted. Utero-parietal adhesion was almost complete at the subsequent section.

Class 11, after the first operation; 'persisted for some time.'

Case 22, after second operation; persisted; always covered with a scab.

Case 45, after the second 'Fundalschnitt.' Operation to cure it proved fatal.

These cases only emphasize the fact that suture of the uterus, despite the vast improvement in its technique, requires the utmost care in its execution. Probably even now too few, rather than too many, sutures are used.

CONCLUSIONS.

1. The mortality of the repeated operation is 6.45 per cent.—four deaths out of sixty-two cases; or, including the death after the repeated 'Fundalschnitt,' 7.93 per cent. It is a question whether the fatal result in the latter case can be justly attributed to the section, since it is quite within the bounds of possibility that the fistula might have healed up had it been left alone.

2. The fertility of women who recover is not impaired.

3. In three-fourths of these patients more or less extensive adhesions are found at subsequent Cæsarean sections. Complete utero-parietal adhesion renders such repetitions exceedingly simple and easy. Most other forms of adhesion introduce difficulty and danger into the operation.

4. All Cæsarean sections should be performed with a view to ulterior pregnancy.

5. This can be done by the adoption of means to ensure complete utero-parietal adhesion.

It is not within the scope of this paper to discuss the relative merits of the three procedures previously mentioned as being open to choice for the delivery of the possessor of a deformed pelvis. It has been my aim to show that in such a woman the conservative operation is justifiable, since its repetition can be made with a comparatively small mortality—a mortality, be it noted, found only in the class of cases in which undesirable utero-visceral adhesions had been formed.

To Michaelis, Sinclair, and Spencer belongs the credit of recognising the condition which diminishes the risks of the operation by rendering its performance extraperitoneal. The next step consisted in the adoption of measures to ensure the formation of utero-parietal adhesion. This has been done by Professor Sinclair of Manchester, and to him belongs the distinction both of establishing the principle and of being the first to apply it clinically.

Other operators have endeavoured to bring about utero-parietal adhesion, but in no case with a view to ulterior pregnancy, the aim being solely to obtain adhesion sufficient to prevent leakage from the uterus into the peritoneal cavity.

TABLE A.

DIVISION I.—CASES OF COMPLETE UTERO-PARIETAL ADHESION.

Number of Case.	Name and Age of Patient ; Indication ; Previous Labours.	Number and Date of Operation ; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
1	Mrs. A. S., 28, 4 ft. high ; three craniotomies ; 'brimmed pelvis.'	First, Dec. 16, 1886, A. H. F. Biggar (Cleveland, O.). Second, Feb. 16, 1892, A. H. F. Biggar.	No details. 'The old operation had resulted in the adhesion of the entire uterine length to the abdominal wall.' The question of sterilizing the patient had been entertained, but it was impossible to carry the idea into execution, 'on account of the most intimate adhesions of the abdominal parietes to the entire length of the uterus.'	R.	L.	<i>Medical Record</i> , 1892, vol. xli., p. 538 (reported by Haggart).
2	Ida S., 23 ; pelvis plana rachitica ; cv. = $\frac{5}{8}$ cm. i. Perforation of dead child.	First, March 9, 1892, Olshausen (Berlin). Second, Aug. 8, 1893, Olshausen.	After extraction inversion of uterus was induced ; placenta peeled off ; retro-placental hæmatoma found ; inversion of uterus reduced, and uterine wound closed with catgut, abdominal wall with silk. Abdominal incision close to old scar. 'Some thin adhesions between uterus and abdominal wall, and also between uterus, omentum, and abdominal wall, partly peeled off, partly divided.' Uterus rolled out ; no trace of old incision on it, peritoneal coat being quite smooth ; incision followed by free bleeding, controlled by digital pressure ; uterus sutured with catgut, abdominal wall with silk. On discharge from hospital uterus found adherent to abdominal wall. Abdominal incision to left of both old scars. 'Uterus adherent to the anterior abdominal wall by the whole of its anterior surface ; adhesions close, broad, and pretty vascular ; they are partly peeled off, a broad band on the right requiring ligaturing and dividing.' Uterus rolled out ; no trace of old incisions ; median fundal incision ; manual compression ; atony ; free hæmorrhage.	R.	L.	F. Hinschius, 'Ueber Sectio Cæsarea conservativa bei engem Pelvis,' Inaug. Diss., 1898, Berlin, pp. 23, 25 ; also R. Olshausen, <i>Zeitschr. f. Geburtsh. u. Gynäk.</i> , bd. xxxvii., hft. 3.
		Third, March 1, 1897, Olshausen.		R.	L.	

TABLE A. DIVISION I.—continued.

Number of Case.	Name and Age of Patient ; Indication ; Previous Labours.	Number and Date of Operation ; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
3	Mrs. A., 1-para, 25; left hip ankylosed; extreme lordosis; cv = 2 in.; abortion between first and second sections.	First, April 10, 1896, W. J. Sinclair (Manchester). Second, Aug. 22, 1901, W. J. Sinclair.	Uterine wound closed with deep silk and superficial catgut sutures. Before operation there were evidences of utero-parietal adhesion. On cutting through the cicatrix 'the incision was found to extend at once into the muscular wall of the uterus, so that the uterine cavity was entered without opening the peritoneal cavity.' When the sutures were being introduced 'anæsthetic vomiting took place, and caused a slight tearing upwards of the wound, so that it extended a short distance into the peritoneal cavity; this was closed.'	R.	L.	The <i>Lancet</i> , Jan. 19, 1901. <i>Trans. North of England Obstet. and Gynecol. Soc.</i> , 1901, p. 65; and private communication kindly made by Professor Sinclair.

DIVISION II.—UTERO-PARIETAL ADHESION ALL BUT COMPLETE.

4	Therese S., 29, 3-para; flat, rachitic pelvis, with general contractions; cv = 6½ to 6¾ cm. 1. Cephalotripsy. 2. Cephalotripsy. Aborted at third month in third pregnancy.	First, March 3, 1886, Leopold (Dresden). Second, Sept. 9, 1887, Korn (Dresden). Third, June 27, 1891, Leopold (Dresden).	Uterus sutured with eight strong silver wire sutures and eighteen superficial interrupted fine silk sutures. Incision to right of old scar; uterus adherent all along line of suture to abdominal wall; its own wall thinned; deep and superficial catgut sutures (chromicized). 'Uterus bound by adhesions to omentum and abdominal parietes; its walls very thin, one part of cicatrix being transparent, so that a rupture would soon have occurred; no trace of chronic catgut; uterine scar excised; deep and superficial silk sutures.'	R.	L.	<i>Arch. f. Gynäk.</i> , 1886, bd. xxviii., p. 112. <i>Centralbl. f. Gynäk.</i> , 1888, p. 11; Leopold, 'Der Kaiserschnitt', 1888, p. 133. <i>Arbeiten aus der Königl. Frauenklinik</i> , Dresden, 1893, bd. i., pp. 302, 308, and 318.
5	Emily K., 28, 3-para; pelvis plana rachitica; cv = 7½ cm.	First, April 16, 1891, Olshausen (Berlin).	No details.	R.	L.	F. Hinschius, 'Ueber Sectio Cæsarea conservativa bei engem Becken,' Inaug. Diss., Berlin, 1898, pp. 22, 24, 29.

TABLE A. DIVISION II.—continued.

Number of Case.	Name and Age of Patient ; Indication ; Previous Labours.	Number and Date of Operation ; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
5—continued.	Emily K.—continued. 1. Forceps ; child dead. 2. Version ; forceps to after-coming head ; child dead.	Second, Feb. 17, 1893, Olshausen. Third, Sept. 7, 1895, Olshausen.	Abdominal incision close to old scar ; numerous firm broad adhesions united the anterior surface of the uterus to the parietal peritoneum of the anterior abdominal wall ; P.P.C. ; free bleeding ; uterus sutured with catgut ; raw surface, 3 cm. long, on left border of uterus, due to separation of adhesions, sewn up. 'The whole anterior abdominal incision close to old scar. 'The whole anterior surface of the uterus was united by firm adhesions to the abdominal wall, so that the uterus was first visible after extensive division of the adhesions with scissors.' 'The divided adhesions did not bleed ; one omental adhesion was ligatured.' The peritoneal cavity was shut off by adhesions entirely, except at the upper and lower angles of the wound, before the separation of the adhesions ; uterus sutured with catgut. On discharge uterus lay high up and was adherent.	R. R.	L. L.	R. Olshausen, <i>Zeitschr. f. Gynäk. u. Geburtsh.</i> , 1893, lft. 3.
6	— 'Narrow pelvis.'	First, ? Second, ?	No details obtainable. No details obtainable.	? ?	? ?	<i>Monatsschr. f. Geburtsh. u. Gynäk.</i> , 1897, bd. vi., p. 45.
7	— 20 ; generally contracted pelvis. 1. Embryotomy.	Third, Jan. 11, 1897, Carl Everke (Bochum). First, June 16, 1895, J. C. McCoy (Pater-son, N.J.).	'Operation almost entirely extra-peritoneal, only about 2 cm. of peritoneum being opened, so extensive were the adhesions.' Uterus closed with deep silk, superficial catgut sutures, silkworm-gut for abdominal wall ; utero-abdominal fistula formed in lower angle of wound, through this menstrual blood escaped ; all discharge ceased in Feb., 1898, on supervision of pregnancy ; P.P.C.	? R.	? L.	<i>Amer. Journ. Obstet.</i> , 1899, vol. xl., p. 508.

TABLE A. DIVISION II.—*continued.*

Number of Case.	Name and Age of Patient ; Indication ; Previous Labours.	Number and Date of Operation ; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
7— <i>continued.</i>	— — — <i>continued.</i>	Second, Nov. 12, 1898, J. C. McCoy.	Abdominal incision to right of old scar ; following conditions found : (1) 'At site of sinus uterus firmly adherent to abdominal wall over a space of 2½ in.' (2) 'On either side of the old scar, in the anterior wall of the uterus, were bands of adhesions extending along the entire length of the organ and across its cervical portion ; the adhesions completely surrounded the field of operation, save at the fundus of the uterus, where they were deficient ; uniting as they did the anterior surface of the uterus to the parietal peritoneum, they made the operative field practically extra-peritoneal.' (3) 'The cicatricial tissue about the sinus in the uterus extended over an area 1½ in. in diameter.' P.P.C. By packing the deficient space above with gauze, the operation was rendered practically extra-peritoneal ; uterus closed with deep interrupted silk sutures ; both ovaries and tubes were then removed.	R.	L.	<i>Journ. of Obstet. and Gynaecol. of British Empire</i> , 1902, p. 138. For further details of this case I am indebted to Dr. Spencer, who kindly conveyed them to me in a private communication.
8	F. W., 27, dwarf ; cv. = 2½ in.	First, Aug. 2, 1893, H. R. Spencer (London). Second, July 28, 1894, H. R. Spencer. Third, April 3, 1900, H. R. Spencer.	'Adhesions to omentum and cæcum.' Performed under eucaïne (local) anaesthesia. 'Owing to the adhesion of the uterus to the abdominal wall, resulting from the previous operations, the peritoneum was only slightly opened at the upper and left part of the incision.'	R.	L.	

TABLE B.

CASES OF INCOMPLETE UTERO-PARIETAL ADHESION.

Number of Case.	Name and Age of Patient; Indication; Previous Labours.	Number and Date of Operation; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
9	Frau P. Schär; generally contracted, flattened pelvis; cv.=7.5 cm.; four perforations; one premature induction.	First, June 22, 1887, Zweifel (Leipzig). Second, Dec. 17, 1888, Zweifel.	Uterus sutured with nine deep and seventeen superficial chromicized catgut sutures. Abdominal incision in old scar; intestine adherent to abdominal wall; omentum to latter and to uterus; with one exception requiring ligature and division; all adhesions separated by finger; the lower part of the uterus was then found directly adherent to the abdominal wall; uterus closed by seven deep silk sutures and a superficial continuous layer of juniper catgut.	R.	L.	<i>Archiv f. Gynäk.</i> , bd. xxxi., p. 209. <i>Archiv f. Gynäk.</i> , 1890, bd. xxxvii., p. 67; <i>Centralbl. f. Gynäk.</i> , 1889, p. 226.
10	Frau Lachmann, 28; 4-para; rachitic pelvis; cv.=6½ cm. 1. Perforation. 2. Perforation. 3. Small, feeble child born alive; died later.	First, March 14, 1886, Leopold (Dresden). Second, June 15, 1891, Leopold (Dresden).	Uterus sutured with eight deep silver and twenty superficial, silk sutures; on discharge from hospital uterus ascertained adherent to abdominal wall. Abdomen opened to left of old incision; uterus strongly adherent to abdominal wall and mesentery; the adhesions had to be partly ligated and divided before it was possible to turn the uterus out of the abdomen; drainage with iodoform gauze required on account of ragged surfaces left after separating adhesions; on discharge from hospital uterus ascertained adherent to abdominal wall.	R.	L.	<i>Archiv f. Gynäk.</i> , 1886, bd. xxviii., p. 115; <i>Arbeiten aus der Königlichen Frauenklinik</i> , Dresden, 1893, bd. i., pp. 302, 316.
11	— 2-para; generally contracted, asymmetrical, funnel-shaped pelvis. 1. Craniotomy.	First, 1883, Krasowski. Second, Oct. 31, 1891, Krasowski.	Uterus sutured in three layers with silk; peritonitis for first ten days; on discharge uterus immobile; ante-flexed; in lower angle of wound was a fistula 6 in. in length, which persisted for some time after. Uterus found adherent to abdominal wall, omentum, and bladder; those uniting the uterus to the first two were strong, and required division; uterus closed with silk sutures.	R.	L.	Alfred Frank, 'Casuistik von mehrfach an derselben Section vorgenommenen Sectio Cæsarea,' Inaug. Diss., Freiburg, 1899, p. 25; also, Frommel, <i>Jahresberichte der Gynäk.</i> , 1892, p. 356.

TABLE B—continued.

Number of Case.	Name and Age of Patient ; Indication ; Previous Labours.	Number and Date of Operation ; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
12	Therese A. Barth, 32, 1 - para ; rachitic flat pelvis, with general contraction ; cv. = 6½ cm.	First, Jan. 25, 1886, Schultze (Jena).	Five deep silver and five superficial silk sutures.	R.	L.	<i>Arch. f. Gynäk.</i> , 1886, bd. xxviii., p. 131.
		Second, July 23, 1888, Schultze (Jena).	Abdomen incised in old cicatrix ; removal of old silver sutures ; uterus firmly adherent to abdominal wall, and below to bladder ; omentum adherent to anterior wall ; transverse colon adherent to abdominal wall above upper angle of wound ; difficulty experienced in freeing adhesions, which were vascular, and required ligaturing and dividing, twenty-four minutes being occupied by this alone ; uterus closed with deep and superficial silk sutures ; on discharge uterus firmly adherent to lower end of abdominal scar, 'nevertheless, corpus uteri freely movable.'	R.	L.	<i>Arch. f. Gynäk.</i> , 1889, bd. xxxiv., p. 134.
13	Christine H., 27, 2 - gravida ; generally contracted, flat pelvis ; cv. = 6½ cm. 1. Premature labour at seventh month.	Third, Aug. 14, 1890, Zweifel.	Abdominal incision to left of old scar ; several adhesions between uterus, and intestines freed ; no mention of any between uterus and abdominal wall ; deep catgut and superficial silk sutures used to close uterus.	R.	L.	'Kaiserschnitt nach der conservirenden Methode bei ein und derselben Person zum zweiten, dritten und vierten Male wiederholt,' P. Kwasniewski, Inaug. Diss., Jena, 1894.
		Fourth, Feb. 22, 1893, Schultze (Jena).	Abdominal incision through extremely thin scar ; numerous adhesions between uterus and abdominal wall below umbilicus ; these did not bleed when separated ; uterine cicatrix 1 cm. wide, 3 mm. thick ; fibrous ; uterus closed with silk.	R.	L.	
		First, 1891, G. Braun (Vienna).	Omentum adherent in several places to parietal peritoneum ; part resected ; no note of utero-parietal adhesions, which, if present, did not interfere with the incision ; uterus left in the abdomen undisturbed.	R.	?	R. Braun v. Fernwald, 'Der Kaiserschnitt bei engem Becken,' Vienna, 1894, pp. 62, 63.
		Second, June 29, 1892, G. Braun.		R.	L.	

TABLE B—*continued*.

Number of Case.	Name and Age of Patient; Indication; Previous Labours.	Number and Date of Operation; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
13— <i>continued</i> .	Christine H.— <i>continued</i> .	Third, July 15, 1893. Koffer (Vienna).	Omentum adherent both to abdominal and uterine walls; uterus dextro-rotated 90 degrees, and firmly held in that position by adhesions; omentum ligatured off, and uterus everted, but the application of the rubber tourniquet was rendered very difficult by intimate adhesions between lower segment of uterus, omentum, and abdominal parietes, especially on the right side, where it was impossible to separate the omentum, a piece of which, the size of the palm of the hand, was resected. Porro's operation.	R.	L.	W. Rühle, 'Conservativer Kaiserschnitt und dreieinhalb Jahre später Operation nach Porro bei derselben Frau wegen Aresia vaginalis artificialis,' J. F. Bergmann, Wiesbaden, 1894 (Separat-Abdruck aus der Festschrift zur Feier des 50-jährigen Jubiläums des Vereins der Aerzte des Reg.-Bez., Düsseldorf).
14	— 25, 2—para; flattened pelvis; dense vaginal cicatrices resulting from injury in first labour prevented measurement of cv. I. Craniotomy.	First, May 13, 1890, Rühle (Elberfeld). Second, Oct. 21, 1893, Rühle (Elberfeld).	Uterus closed with deep and superficial silk sutures; then the omentum was drawn over the anterior uterine surface; on tenth day abscess in lower angle of abdominal wound; P.P.C. Abdomen opened through old scar; a coil of intestine was adherent by one side with the uterus, and by the other with the abdominal scar; these adhesions were very vascular; two long adhesions passed from fundus to abdominal scar; also a broad-based one partly from fundus, partly from area on its left; this joined the thinnest part of the scar, a few mm. thick only, and much wider than the rest of its extent. Porro's operation.	R.	L.	
15	Frau L. F., 33, 1—para; rickety, flat pelvis; cv. = 4 cm.	First, July 7, 1886; doctor at patient's home. Second, April 10, 1894, Löhlein (Giessen).	No details given, except that 'numerous small abscesses' developed in the abdominal wall; afterwards a hernia appeared over the symphysis pubis. Before operation there were ascertained: (1) presence of left ovary in fist-sized ventral hernia. (2) Adhesion of transverse colon to abdominal wall. Abdominal incision to right of old scar opened peritoneum at once; there was only one cord-like adhesion uniting uterus to abdominal wall, and rotating former on its long axis; there were some omental adhesions to the abdominal wall; left ovary lay as diagnosed. Porro's operation.	R.	L.	A. Hofmann, 'Sechs Fälle von wiederholter Laparotomie bei derselben Person,' Inaug. Diss., Giessen, 1894.

TABLE B—continued.

Number of Case.	Name and Age of Patient ; Indication ; Previous Labours.	Number and Date of Operation ; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
16	Louise L., 26, 1-gravida ; rachitic flat pelvis ; cv. = about 6 cm.	First, Jan. 2, 1890, Löhlein (Giessen).	Uterus closed with three rows of catgut sutures.	R.	L.	Albert Hofmann, 'Sechs Fälle von wiederholter Laparotomie bei derselben Personen,' Inaug. Diss., Giessen, 1894.
		Second, April 14, 1891, Löhlein.	Abdominal incision to left of scar ; omentum adherent to upper angle of latter : easily peeled off, as were single strands of adhesions between uterus and abdominal wall ; uterus closed with deep silk and superficial sutures.	R.	L.	H. Löhlein, <i>Verhandl. der deutsch. Gesellschaft für Gynäk.</i> , Sixth Congress, 1895, p. 675 ; H. Löhlein, <i>Gyn. Tagesfragen</i> , vol. i., p. 7.
		Third, May 11, 1895, Löhlein.	Abdominal incision to right of first scar ; in the neighbourhood of the former scars were fine adhesions, easily broken down, between uterus, omentum, and abdominal parietes ; the uterine wall was markedly thinned, and the cicatrix appeared as a linear streak ; on dismissal the uterus was adherent to the abdominal wall, but its mobility did not seem to be very much impaired ; P.P.C.	R.	L.	
17	L. R., 28, 4 - para ; rachitic flat pelvis, with general contraction ; cv. = (?) 1. Dead foetus born spontaneously. 2. Dead foetus delivered with 'instruments.' 3. Decapitation of dead foetus.	First, Feb. 11, 1886, G. H. van der Meij (Amsterdam).	Uterus sutured with silk. 'Slight circumscribed peritonitis followed operation.'	R.	L.	<i>Nederlandsche Tydschr. van Verloskunde en Gyn.</i> , vol. i.
		Second, Sept. 25, 1888, G. H. van der Meij (Amsterdam).	Several strong adhesions between uterus and abdominal wall ; no traces of old scar or of sutures ; uterus sutured with silk.	R.	L.	Torggler, <i>Wiener Klinik</i> , 1890, hft. i., p. 15.
		Third, Feb. 1, 1896, C. N. van der Poll (Amsterdam).	Abdominal incision 1 cm. from old scar ; omentum adherent to upper part of abdominal scar ; below broad adhesions between uterus and abdominal wall. Porro's operation. Abdomen reopened same evening for bleeding from separated intestines.	R.	L.	<i>Centralbl. f. Gynäk.</i> , 1896, p. 554.
18	Mrs. C., 25, 1 - para ; scoliorachitic flat pelvis ; cv. = $2\frac{3}{4}$ in.	First, Sept. 28, 1892, C. P. Noble (Philadelphia).	Uterus sutured with silk.	R.	L.	<i>Annals of Gynecology and Pediatrics</i> , 1893.

TABLE B—continued.

Number of Case.	Name and Age of Patient; Indication; Previous Labours.	Number and Date of Operation; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
18—continued.	Mrs. C.—continued.	Second, Aug. 12, 1897, G. M. Boyd (Philadelphia).	Incision to one side of old abdominal scar. 'Several omental adhesions were now loosened; then it was found that the uterus and abdominal wall were firmly united at the lower angle of the old incision.' These adhesions were not separated.	R.	L.	<i>Amer. Journ. Obstet.</i> , 1898, vol. xxxvii, p. 322.
19	E. L., 23, 1-gravida; 'pelvic contraction.' 2. Induction of premature labour.	First, Nov. 23, 1887, Hegar (Freiburg). Second, July 6, 1894, Sonntag (Freiburg). Third, Sept. 25, 1897, Bülius (Freiburg).	Uterus closed with deep interrupted silk and superficial catgut sutures. Thin abdominal wall; no mention of adhesions; uterus closed with deep and superficial silk sutures. Abdominal wall 'right thin'; incised through old scar; with the opening of the peritoneum the lower part of the uterus was found adherent to the abdominal wall by broad adhesions; in the region of the umbilicus the omentum was adherent; latter was double ligatured and divided; some uterine adhesions were divided with scissors, and it was then found that the lower part of the uterus was but little developed, and was proportionately thin; the incision was therefore placed high up, beginning at fundus; uterus closed by deep and superficial silk sutures; Fallopian tubes were adherent to their respective ovaries; double removal.	R. R. R.	L. L. L.	A. Frank, 'Casuistik von mehrfach an derselben Person vorgenommener Sectio Cæsarea,' Inaug. Diss., Freiburg, 1899.
20	— 40; flat, rachitic pelvis; cv. = 8½ cm. 1. Perforation. 2. " 3. "	First, Dec. 12, 1891, ? (Groningen). Second, June 10, 1899, J. F. Selhorst (Leuwarden).	Details lacking; apparently good recovery. Abdominal incision to right of old scar; lower part of uterus adherent to parietes; above, several coils of small intestine adherent to parietes; gut wounded; small purulent collection containing sutures found on uterine wall; P.P.C.	R. R.	? L.	'Een Geval van Sectio Cæsarea recidiva,' J. F. Selhorst, Groningen, 1900.

TABLE B—continued.

Number of Case.	Name and Age of Patient ; Indication ; Previous Labours.	Number and Date of Operation ; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
21	— dwarf.	20 ; First, Sept. 7, 1892, A. V. Johannovsky (Reichenberg). Second, June 5, 1900, A. V. Johannovsky (Reichenberg).	Uterus sutured with silk ; on discharge uterus ascertained adherent to abdominal wall. Abdominal incision a finger's breadth to right of scar ; peritoneal cavity opened above umbilicus ; extensive firm adhesions were at once encountered, for separation of which knife and scissors were required.	R.	Died when three weeks old. L.	<i>Monatschr. f. Geburtsh. Gynäk.</i> , bd. xii., p. 326. <i>u.</i>
22	— pelvic deformity.	First, 1895. Second, Sept. 14, 1897, Brünings (Munich). Third, Jan. 3, 1901, Gustav Wiener (Munich).	Eight days after operation formation of abscess between uterus and abdominal wall ; after this had healed there remained a shallow depression, sometimes moist, always covered with a scab. Uterus firmly adherent to abdominal wall, omentum, and intestines. Porro's operation.	R. R. R.	 Dead when delivered.	<i>Monatschr. f. Geburtsh. Gynäk.</i> , bd. xiii., p. 456. <i>u.</i>

TABLE C.

CASES OF UTERO-VISCERAL OR PARIETO-VISCERAL ADHESION.

23	Frau Rüttgen, 4 ft. 3 in. in height ; rachitic pelvis, with oblique contraction ; cv. = 3½ cm. 'Schaltwirbelbecken.'	First, 1875, Schlemmer and Vonderbank (Cali). Second, Feb. 16, 1878, F. G. H. Birnbäum (Cologne).	No details. Abdominal incision at once exposed uterus lying free ; omentum adherent to anterior abdominal wall ; at lower part of uterine scar was a subperitoneal effusion of blood, indicative of some tearing of uterus ; latter bled freely from veins when incised ; hæmorrhage after delivery checked by ice placed <i>in utero</i> ; four catgut sutures closed the 8½ cm. uterine incision ; drainage-tube placed in lower angle of abdominal wound.	R. R.	? L.	<i>Archiv f. Gynäk.</i> , 1885, bd. xxv., p. 422.
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TABLE C—continued.

Number of Case.	Name and Age of Patient ; Indication ; Previous Labours.	Number and Date of Operation ; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
23— con- tinued.	Frau Rittgen—continued.	Third, 1879, Malmedy (Cologne). Fourth, Nov. 8, 1881, Birnbaum (Cologne). Fifth, March 31, 1884, Birnbaum (Cologne).	No details obtainable. Omentum adherent to whole length of abdominal scar ; it required division ; subperitoneal blood effusion found at lower angle of uterine cicatrix, as in the second operation ; free bleeding during operation checked with ice ; uterus closed with catgut. Subperitoneal blood effusion again present ; omentum adherent to uterus ; it was ligatured and divided ; uterus closed with catgut.	? R. Died ; p.m., intestinal adhesions ; uterine wound gaped in its centre ; spleen softened.	? L. L.	<i>Archiv f. Gynäk.</i> , 1886, bd. xxviii., pp. 252, 256 (Cases 12 and 20). <i>Archiv f. Gynäk.</i> , 1886, bd. xxviii., p. 256 (Case 21). <i>Bulletin de la Société des Médecins et Naturalistes de Jassy</i> , Jan., 1890, p. 7. <i>Deutsche med. Wochenschr.</i> , 1891, No. 41, p. 1149. <i>Centrabl. f. Gyn.</i> , 1893, p. 782.
24	— 37 ; 10-para ; eight normal labours, ninth forceps ; osteomalacia.	First, 1882, Birnbaum. Second, 1884, Birnbaum.	A coil of intestine adherent to abdominal wall ; placenta attached anteriorly ; 'enormous hæmorrhage'.	R. Died from septic peritonitis.	L. L.	
25	— Dwarf.	First, May, 1888. Second, May, 1890, Bejan (Roumania).	There were no adhesions between uterus and abdominal wall, but intestines were adherent to the uterus ; the wall of the latter was thinned ; the uterus was not sutured.	? Died from general peritonitis.	? L.	
26	— 1-para ; pelvic deformity ; cv. = 8.5 cm.	First, 1891, Staude (Hamburg). Second, July 2, 1893, Staude (Hamburg).	Uterus closed by twenty silk sutures and a continuous catgut layer ; placenta anterior. Omentum adherent to abdominal wall ; uterus free, except for one long, slender adhesion passing from it to the abdominal wall ; old scar showed as a smooth narrow streak ; no trace of old sutures ; uterus sutured with silk ; P.P.C.	R. R.	L. L.	

TABLE C—continued.

Number of Case.	Name and Age of Patient; Indication; Previous Labours.	Number and Date of Operation; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
27	Barbara K., 29, 1-gravida; generally contracted, flat pelvis; cv. = 8 cm.	First, 1891, Sebauta. Second, June 18, 1893, G. Braun (Vienna).	Peritoneum underlying old scar thickened; omentum adherent to uterus over area, the size of a crown-piece, ligatured and divided; no uterine adhesions; P.P.C. Uterus closed with ten deep and twelve superficial catgut sutures; placenta lateral, right side.	R.	?	R., Braun v. Fernwald, 'Der Kaiserschnitt bei engen Becken,' Vienna, 1894, p. 74.
28	— 32, 1-para; flattened pelvis, with oblique deformity and general contraction.	First, April 27, 1893, Schneider (Fulda). Second, Sept. 6, 1894, Schneider (Fulda).	Uterus not adherent to abdominal wall, but omentum and intestines adherent to posterior uterine wall; these rendered eversion of uterus difficult, and application of rubber tourniquet impossible, manual compression was therefore resorted to; uterus closed with eight deep and ten superficial catgut sutures; scar tissue excised from abdominal wall, which was closed with silk; P.P.C.	R.	L.	<i>Centralbl. f. Gynäk.</i> , 1893, p. 1057.
29	— Report very incomplete.	First, Smyly (Dublin). Second, Smyly (Dublin).	No details given. Operation was begun when daylight was fading, and had to be finished by lamplight; abdomen opened; uterus drawn out; intestines firmly adherent to the uterine scar; detached with difficulty; uterine cicatrix so thin that it gave way to pressure of thumb; the cicatricial margins did not offer sufficient raw surface to insure firm union, so they were split with scissors and united with alternate deep and superficial sutures.	?	?	<i>Centralbl. f. Gynäk.</i> , 1895, p. 97. <i>Dublin Journ. Med. Sci.</i> , 1895, vol. xcix, p. 270.
30	A. K., 27, 1-para; generally contracted, flat pelvis; cv. = 7 to 7½ cm.	First, April 29, 1890, Leopold (Dresden). Second, Nov. 20, 1897, Leopold.	Uterus sutured with silk. Diastasis of recti muscles; uterine wall thinned; firm adhesions with sigmoid flexure divided with Pacquelin's cautery; P.P.C.	R.	L.	<i>Arbeit. aus d. kgl. Frauenkhl.</i> , Dresden, bd. i., p. 314 (Case 31). <i>Arch. f. Gyn.</i> , 1898, bd. lvi., p. 14 (Case 70).

TABLE C—continued.

Number of Case.	Name and Age of Patient ; Indication ; Previous Labours.	Number and Date of Operation ; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
31	— 20, 2-para ; flattened, rachitic pelvis. 1. Version and craniotomy.	First, June 9, 1896, E. Pollak. Second, June 25, 1897, E. Pollak.	Abdominal incision to left of scar ; uterus not adherent ; omentum adherent to uterus, especially on right ; uterus sutured with seven deep and twelve superficial silk sutures. Abdominal incision through old scars ; omentum adherent in several places to uterus ; later closed with eight deep and ten superficial silk sutures.	R. R. R.	L. L. L.	<i>Centraltbl. f. Gynäk.</i> , 1899, p. 401. <i>Trans. North of Eng. Obstet. and Gynaecol. Soc.</i> , 1902, p. 33.
32	— 26 ; contracted pelvis ; sacrum alone deformed ; cv. = 2 in. 1. Embryotomy.	First, Feb. 15, 1900, N. Raw (Liverpool). Second, Nov. 13, 1901, N. Raw (Liverpool).	Uterus closed with deep and superficial silk sutures. 'The uterus was not all adherent to the abdominal wall, although some bands of omentum were adherent to the scar.' P. P. C.	R.	L.	

TABLE D.

CASES OF FILAMENTOUS UTERO-PARIETAL ADHESION.

Number of Case.	Name and Age of Patient ; Indication ; Previous Labours.	Number and Date of Operation ; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
33	L. B. (née K.), 23, 1-para ; pelvis plana rachitica ; cv. = 5.75 cm.	First, Oct. 18, 1892, Olshausen (Berlin). Second, March 26, 1895, Olshausen.	'No important adhesions.' Incision encountered part of placenta.	R. R.	L. L.	F. Hinschius, 'Ueber Sectio Cæsarea conservativa bei engem Pelvis,' Inaug. Diss., Berlin, 1898, pp. 24, 28.
34	Rachitic, pseudo-osteomalacic pelvis ; cv. = 8 cm.	First, July 6, 1893, Tarnier (Paris). Second, ? Third, June 23, 1896, Paul Bar (Paris).	Uterus sutured with silk. Incompletely recorded ; no trace on uterus of first operation, therefore presumably no adhesions. Incision in linea alba ; numerous thin utero-parietal adhesions, easily broken down by the finger.	R. R. R.	L. L. L.	<i>Nouv. Archiv d'Obstet. et de Gynaecol.</i> , 1895, vol. x., p. 178. <i>L'Obstétrique</i> , 1899, vol. iv., p. 193. I desire to express my indebtedness to Professor Paul Bar for his kindness in assisting me to verify the reference to this case.

TABLE D—continued.

Number of Case.	Name and Age of Patient ; Indication ; Previous Labours.	Number and Date of Operation ; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
35	— 1-para ; rachitic, pseudo-osteomalacic pelvis ; cv. = 7.5 cm.	First, May 2, 1894, Paul Bar (Paris). Second, June 16, 1896, Paul Bar. Third, July 14, 1897, Tisser (Paris).	Uterus sutured with silk. Abdominal incision through linea alba ; some weak adhesions separated by finger ; uterus sutured with silk. Uterine wall extremely thinned, threatening hernia of the ovum ; adhesions very slight, and caused no difficulty.	R. R. R.	L. L. L.	<i>L'Obstétrique</i> , 1899, vol. iv., p. 193 ; also 'Leçons de Pathologie Obstétricale,' by Paul Bar, Paris, 1900, p. 13.
36	— 29, dwarf ; rachitic, flat pelvis ; cv. = 6.4 cm.	First, Oct. 27, 1887, Schauta (Prague). Second, April 4, 1890, Schauta.	Uterus closed with eleven deep silver wire and seventeen superficial silk sutures ; on recovery uterus movable and not tender. Abdominal incision in old scar ; uterine scar covered by a 'pseudo-membrane,' which spread out in a fan-shape to the scar of the anterior abdominal wall ; this was divided ; uterus closed with deep silver and superficial silk sutures.	R. R.	? L.	A. Frank, 'Casuistik von mehrfach an derselben Person vorgenommener Sectio Cæsarea,' Inaug. Diss., Freiburg, 1899, <i>Wiener med. Presse</i> , 1899, No. 26.

TABLE E.

CASES IN WHICH THERE WERE NO ADHESIONS.

37	Marie Kaiser, 28 ; flat pelvis ; cv. = 2 to 2½ cm. ; two abortions.	First, May 8, 1875, Lungren (Toledo, O.). Second, May 22, 1880, Lungren.	Liquor amnii drawn off before operation by a catheter introduced through cervix ; P. P. C. ; uterus sutured with silver wire ; when the patient was dismissed it was freely movable. No adhesions ; Fallopian tubes tied 1 in. from the uterine end.	R. R.	L. L.	<i>Amer. Jour. Obstet.</i> , 1881, vol. xiv., p. 78.
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TABLE E—continued.

Number of Case.	Name and Age of Patient; Indication; Previous Labours.	Number and Date of Operation; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
38	Frau Stöpel, 36, 3 gravida; generally contracted, rickety, flat pelvis; cv. = 7 cm. 1 and 2. Delivery of dead children.	First, Nov. 1, 1886, Korn (Dresden). Second, June 25, 1888, Korn. Third, Sept. 22, 1890, Korn.	Uterus closed with deep and superficial catgut sutures; movable on dismissal. No note of operation, except that uterine cicatrix was perfectly smooth; suture with deep and superficial silk; movable on dismissal. Uterus completely free from adhesions; silk sutures; seven months later uterus quite movable and free from adhesion.	R. R. R.	L. L. L.	<i>Arch. f. Gynäk.</i> , bd. xxx., p. 332; also <i>Verhandlungen der Deutschen Gesellschaft f. Gynäk.</i> , Fourth Congress, 1892, p. 376. A. Burkhardt, 'Sectio Cæsarea nach der conservierenden Methode bei ein und derselben Frau zum zweiten und dritten Male wiederholt,' Inaug. Diss., Jena, 1891. <i>Ann. de Gynécol. et d'Obstét.</i> , 1889, vol. xxxi., p. 272, and 1891, vol. xxxv., p. 372.
39	Adele C., 25; non-rachitic dwarf; generally contracted pelvis.	First, Oct. 1, 1888, A. Crimail (Pontoise). Second, Feb. 19, 1891, A. Crimail.	Uterus sutured with fils de Florence. No trace of adhesions; uterine cicatrix very firm, and contained three of the sutures used at the first operation; double ligature and division of tubes 5 cm. from uterus; omentum placed apron-like in front of uterus.	R. R.	Died ante-partum. L.	 <i>Arch. f. Gynäk.</i> , bd. xxx., p. 330; <i>Arbeiten aus der königlichen Frauenklinik in Dresden</i> , Leopold, bd. i., pp. 302, 316.
40	Frau Pilz (Pauline L.), 24, 1-gravida; rachitic pelvis.	First, May 30, 1886, Korn (Dresden). Second, April 29, 1891, Leopold (Dresden). Third, Nov. 4, 1896, Leopold.	Uterus closed with deep silver and superficial silk sutures. Uterus not adherent; removal of silver wire sutures used at first operation; resection of uterine scar. Adhesions not mentioned; uterus closed with silk sutures.	R. R. R.	L. L. L.	<i>Arch. f. Gynäk.</i> , bd. xxx., p. 330; <i>Arbeiten aus der königlichen Frauenklinik in Dresden</i> , Leopold, bd. i., pp. 302, 316. <i>Arch. f. Gynäk.</i> , 1898, bd. lvi., p. 10.
41	— 36; spondylo-lithetic pelvis; cv. = 7 to 7½ cm. 1. Version. 2. Induction. 3. Induction. All children dead 4. Abortion. 6. Induction at third month.	First, Dec. 3, 1895, R. v. Braun-Fernwald. Second, Jan. 7, 1898, R. v. Braun-Fernwald.	Uterus closed with two layers of silk sutures; P.P.C. No adhesions; uterine wall thinned; silk sutures intact. Fundalschnitt, Porro's operation.	R. R.	L. Died next day.	<i>Arch. f. Gynäk.</i> , bd. lii., p. 78; <i>Centralbl. f. Gynäk.</i> , 1898, p. 489.

TABLE E.—*continued.*

Number of Case.	Name and Age of Patient ; Indication ; Previous Labours.	Number and Date of Operation ; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
42	— Generally contracted pelvis.	First, June 20, 1895, Carl Everke (Bochum). Second, March 29, 1898, C. Everke.	Uterus closed with deep and superficial silk sutures. No adhesions between uterus and abdominal wall ; uterus incised sagittally through fundus ; atony ; free hæmorrhage. Porro's operation.	R.	Died ante-partum.	<i>Münchener med. Wochenschr.</i> , 1898, p. 661.
43	J. J., 27, m., 1-gravida ; contraction of pelvis, dependent on hip-joint disease in childhood ; cv. = 2 to 2½ cm.	First, April 6, 1901, A. J. Wallace (Liverpool). Second, April 16, 1902, A. J. Wallace.	Uterus closed with chromicized catgut sutures, deep and superficial. Abdominal incision through old scar ; adhesions were entirely absent ; uterine cicatrix visible as a faint linear depression ; thick and well consolidated ; uterus closed with catgut, and the wound sewn to the abdominal parietes.	R.	L.	<i>Liverpool Medical-Chirurg. Jour.</i> , September, 1902.

TABLE F.

CASE OF POSTERIOR INCISION OF UTERUS.

44	Frau Y., 23, 1-para ; generally contracted, flattened pelvis ; cv. = 8.8 cm.	First, June 22, 1899, A. Sippel, Frankfurt-am-M. Second, Sept. 11, 1899, E. Petersen, Frankfurt-am-M.	Uterus opened by posterior median incision ; sutured with continuous catgut sutures ; placenta attached to anterior wall. Division of cord-like adhesion running to anterior parietes ; similar adhesion united small intestine to scar on posterior wall ; transverse fundal incision ; uterus closed with continuous silk suture ; P.P.C. ; on dismissal from hospital abdominal scar three fingers' breadth above symphysis ; to its lower third the fundus of the high-lying, anteflexed uterus was adherent.	R.	L.	<i>Arch. f. Gynäk.</i> , 1899, bd., lvii., p. 543. <i>Centralbl. f. Gynäk.</i> , 1899, p. 1409.
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TABLE G.

CASES OF REPEATED FUNDALSCHNITT.

Number of Case.	Name and Age of Patient; Indication; Previous Labours.	Number and Date of Operation; Operator.	Notes on Operation.	Results.		References.
				Mother.	Child.	
45	A. E., 30; generally contracted, flat, rachitic pelvis; double promontory; cv. = 9 cm. I. Perforation.	First, May 3, 1897, Fritsch (Bonn). Second, Feb. 18, 1899, Fritsch (Bonn).	Eventration of uterus; fundalschnitt encountered placenta; on dismissal from hospital uterus anteverted, lying in pelvis; not adherent. Abdominal incision to left of old, well-healed scar; omentum adherent to right of uterine scar and to fundus immediately behind; ligatured and divided; fundal scar well marked on right side only; after incision neither cicatricial tissues nor thinning of the wall could be demonstrated (<i>vide</i> paper for after-history); uterus on discharge from hospital fixed high up to abdominal wall; utero-parietal fistula.	R.	L.	H. Schroeder, <i>Monatsschr. f. Geburtsh. u. Gynäk.</i> , 1901, xlii., pp 31-33.
46	Frau M. D., 28, 1-gravida; rickety flat pelvis; cv. = 7½ cm.	First, Jan. 12, 1898, R. Hlawacek (Vienna). Second, June 9, 1899, H. Ludwig (Vienna).	Fundalschnitt. Uterus closed with deep and superficial silk sutures, and dropped back into the abdomen; it was then discovered that two coils of small intestine were adherent to the serosa parietalis, above the upper angle of the abdominal incision. Abdomen opened through old scar, which was firm, and showed no signs of weakening; at upper end of incision omentum adherent to parietal peritoneum, and a small part of it to sites of silk sutures around hardly-recognizable uterine scar; all easily separated; Fundalschnitt repeated, placenta presenting through incision; uterine scar 1½ cm. in thickness; well consolidated.	R.	L.	H. Ludwig, <i>Centralblatt f. Gynäk.</i> , 1899, p. 801.

NOTE.—Through the courtesy of Dr. Eden, I am able to draw attention to another case of repeated Cesarean section, a summary of which will be found among the obstetrical abstracts of the present number of the Journal.

BIBLIOGRAPHY.

CASES IN WHICH THERE IS NO MENTION OF ADHESION.

Uterus sutured ; cases all verified. Cæsarean section was performed on two occasions in each case ; all successful.

¹ CHAS. L. ILL : *Amer. Jour. Obstet.*, 1901, vol. xlv., p. 651.

² M. GUENIOT : *Ann. de Gynécol.*, 1894, vol. xlii., p. 98.

³ *Ibid.*

⁴ T. W. COAKLEY : *Jour. Amer. Med. Ass.*, 1896, xxvi., p. 720.

⁵ T. FORSTER and LAWSON TAIT : *Lancet*, 1886, ii., p. 294 ; and 1890, ii., pp. 766 and 853.

⁶ BALANDIN and V. OTT : *Monatsschr. f. Geb. u. Gyn.*, Bd. iii., p. 160.

⁷ R. OLSHAUSEN : F. Hinschius, 'Ueber Sectio Cæsarea Conservativa be engem Pelvis.' Inaug. Diss., Berlin, 1898, pp. 26, 31.

⁸ FALASCHI : *Raccoglitore Med.*, April 20, 1892. Ref. *Centralbl. f. Gyn.*, 1892 p. 774.

⁹ TH. BRÜNINGS : 'Ueber theilweise Verdünnung einer alter Kaiserschnitts-narbe bei wiederholter Schwangerschaft.' S. Karger, Berlin.

¹⁰ LEOPOLD : *Arbeiten aus der königlichen Frauenklinik in Dresden*, 1893 Bd. i., pp. 312, 320.

¹¹ *The same* : *Arbeit. a. d. kgl. Frkl.*, Bd. i., p. 310 (Case 24) ; *Arch. f. Gyn.*, 1898, Bd. lvi., p. 2 (Case 43).

¹² *The same* : *Arbeit. a. d. kgl. Frkl.*, Bd. i., p. 298 (Case 1) ; *Arch. f. Gyn.*, 1898, Bd. lvi., p. 2 (Case 44).

¹³ *The same* : *Arbeit. a. d. kgl. Frkl.*, Bd. i., p. 320 (Case 40) ; *Arch. f. Gyn.*, 1898, Bd. i., p. 4 (Case 47).

¹⁴ *The same* : *Arch. f. Gyn.*, 1898, Bd. lvi., pp. 4, 20 (Cases I. 50 ; II. 21).

¹⁵ *The same* : *Arbeit. a. d. kgl. Frkl.*, Bd. i., p. 314 (Case 32) ; *Arch. f. Gyn.*, 1898, Bd. lvi., p. 10 (Case 61).

¹⁶ *The same* : *Arch. f. Gyn.*, 1898, Bd. lvi., p. 10 (Case 63).

¹⁷ *The same* : *Ibid.*, 1898, Bd. lvi., p. 12 (Case 66).

CASES OF MORE OR LESS MYTHICAL ORIGIN.

SPRENGEL, in his 'Geschichte der Chirurgie,' mentions several cases :

1 (Bd. I., p. 385). Sonnius, a physician at Bruges, operated seven times on his wife.

2 (*Ibid.*, p. 434). A ship-captain alleged that he was the sixth of seven sons, all of whom had been delivered by means of Cæsarean section. With the seventh child the patient died, because the doctor who had performed the previous operations was no longer alive.

3. One, Jac. Robin, stated that he was the fifth son of a woman who had been delivered of all her children by Cæsarean section.

1. ROUSSET : 'Exsectio Fœtus Vivi,' etc., a Casp. Bauhini Latio reddita. Francf., 1601, Hist. i., p. 10. Original paper, entitled 'Hysterotomotokie,' published in 1581.

The wife of a certain Gothard, living in Mesnilium, a parish of Millyum, who was unable to bring forth in any other way, was delivered six times by Cæsarean section of always living children, after which Nicholas Guillet, the barber who performed the sections, died, and the woman died in her seventh pregnancy, as no one was able to perform the section.

2. RAYNAUD : 'De Ortu Infantum Contra Naturam,' Lugd., 1637, p. 61.

In the town of Auçois, in the Moorish quarter, there was lately a woman upon whom Cæsarean section had been carried out six times. The same thing happened to a woman in the state of St. Joannis Mauien Mauriansis, her name being Maupa.

3. *Ibid.*, p. 62.

It is related that a woman was three times delivered by Cæsarean section of living children.

4. TH. BARTHOLINUS : 'Histor. anatom. rar. Hagæ Com.,' 1654, Cent. ii., Hist. viii., p. 160.

The wife of a Parisian surgeon was delivered by Cæsarean section 'four times and more,' and 'no harm done.' 'Certainly this should be a convenient way, especially when the orifice of the uterus is too small and the foetus is too weak, if immediately the operator is summoned whilst the strength of the puerperal woman is still maintained. That the operation can be performed without any danger is shown by the reasoning and the cases mentioned by Rousset and Raynaud.'

5. TITSINGS DIANA, 1750, p. 781. (Guenin : 'Histoire de Deux Opérations Cæsariennes,' Paris, 1750.)

The case of a woman is mentioned who was seven times delivered by Cæsarean section. She died after the seventh operation.

The persistent recurrence of the number 'seven' suggests the legendary nature of these stories. Compare the seven stars of Ursa major, the seven sleepers, etc. See 'The Night of the Gods,' vol. ii., p. 931, by John O'Neill. David Nutt, 1897.

CASES OF THE 'OLD OPERATION.'

Cases in which Two Sections were Performed on each Patient.

¹ BACQUA (1797-1806) : *Recueil Périodique de la Soc. de Méd. de Paris*, tom. ii., p. 434.

² D'ARISTE, of Martinique (1805-07) : *Dict. des Sc. Méd.*, 1816, tom. i., and *Ed. Med. and Surg. Jour.*, vol. iv., p. 178.

³ CHARMEIL (1813-14) : *Jour. Gén. de Med. Chir. et Pharm.*, 1812, tom. li., p. 201.

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