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CÆSAREAN SECTION

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CÆSAREAN SECTION

WITH A TABLE OF 120 CASES

BY

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CÆSAREAN SECTION.

CHAPTER I.

HISTORICAL.

THE term Cæsarean Section should be applied only to the operation of incising the abdominal wall and uterus to deliver the child at or near term. It has been applied also in modern times to the incision of the cervix and lower segment through the vagina, with the modification Vaginal Cæsarean Section;¹ for the latter the term Vaginal Hysterotomy is preferable, since the incision through the vagina cannot be properly described as a Cæsarean Section.

The origin of the term "Cæsarean" has been much disputed. In his "Naturalis Historia" Gaius Plinius, the Elder (A.D. 23-79), wrote "Auspiciatus enecta parente gignuntur; sicut Scipio Africanus prior natus, primusque Cæsarum,² a cæso matris utero dictus: qua de causa et Cæsones appellati. Simili modo natus est Manilius qui Carthaginem cum exercitu intravit."

The meaning here is doubtful; the "primusque Cæsarum" may refer to Scipio Africanus or to the first Cæsar who was so called from being *cut* from his mother's

¹ Dührssen, "Der vaginale Kaiserschnitt," Berlin, 1896.

² In the Franzius edition, with Harduinus's notes (Historia Naturalis, 1779, Cap. vii, p. 60), *Cæsarem* is printed in error.

womb. Popularly, Julius Cæsar (100-44 B.C.) is supposed to be intended; but, as Julius Cæsar's mother survived many years after his birth and no reference is made to an operation in the histories of the time, it cannot be that Julius Cæsar was the person after whom the operation was named.

It is by no means certain that Scipio Africanus (237-183 B.C.) was the first to bear the name of Cæsar. Salmasius¹ notes that there existed a Cæsar before the Samnite war (343 B.C.) and supports his statement by an inscription, "Cæs. Ap. Claudius," which however is said to be a misreading of "Cens. Ap. Claudius."

Spartianus Ælius,² in a letter to the Emperor Diocletian (A.D. 284-305), states that the first commoner³ to bear the name of Cæsar was Ælius Verus,⁴ whom Hadrian had adopted as his heir. After the death of Ælius Verus, Hadrian nominated Titus Aurelius (afterwards Antoninus Pius) as his successor, and died in A.D. 138 after writing those beautiful verses to his soul:—

Animula vagula blandula,
Hospes comesque corporis,
Quae nunc abibis in loca?
Pallidula rigida nudula,
Nec ut soles dabis jocos.

According to Spartianus, to whom we are indebted for the record of these verses, "there was nothing

¹ Pliny, "Naturalis Historia," *loc. cit.*, note, page 60.

² *Historiæ Romanæ Scriptorum Latinorum Veterum, qui extant, omnium,* 1623 edition.

³ qui nec principes nec Augusti fuerunt."

⁴ His full title was Lucius Ceionius Commodus Verus Ælius Cæsar. His son became the Emperor Commodus.

memorable in Ælius Verus except that he was the first (commoner) to bear the name of Cæsar." He appears to have been chosen by Hadrian rather for his good looks than for his morals, which are sufficiently indicated by his reply to his wife when she complained of his pleasures away from home—"patere me per alienas exercere cupiditates meas: uxor enim dignitatis nomen est, non voluptatis." He was a gourmet, the inventor of a luxurious lounge and of the "tetrpharmacum" (more accurately, the penta-pharmacum), which consisted of a sow's udder, pheasant, peacock, "crusted gammon," and wild boar.¹ The "perna crustulata" appears to be gammon with the crackling so beloved of Elia.

It would be absurd to suppose that the birth of such an insignificant individual as Ælius Verus could have originated the name of Cæsarean Section, and there are not wanting other suggestions for the origin of the name Cæsar, e.g., from a Moorish or a Punic word *Cæsa*, meaning elephant (this animal trampling on a serpent appears on coins struck in honour of Cæsar); or from the presence of an unusual amount of hair (*cæsaries*) at birth, or from *cæsius*, meaning grey-eyed.;

The probability is that in stating that "Cæsar" was derived "a cæso matris utero," Pliny was exercising his lively imagination in etymology,² as he occasionally did in history, and it is not unlikely that this—the greatest of all operations, in that it directly affects two

¹ "Sumen, fasianum, pavonem, pernam crustulatam et apruquam."

² Pliny derives "Agrippa," by which name those born feet first were designated, from *ægre partus*, though a more likely derivation is from *ἄγρια ἵππος*, the wild mare; see Fasbender, "Gesch. die Geburtsh." Fasbender gives *ἄγρια ἵππα*; but *ἵππα* is a woodpecker, which has not the fox's habit of emerging from its hole tail first.

lives—was called Cæsarean as being too grand to have been first performed on ordinary mortals, just as the Germans gave it the name of Kaiserschnitt in the days when Kaisers were important personages.

Whatever may have been the origin of the term the operation itself is of great antiquity, and is said by Ovid to have been the means by which Æsculapius came into the world.

Natum flammis uteroque parentis
Eripuit geminique tulit Chironis in antrum.

Although it is not mentioned by Celsus, Soranus, Ætius or Paulus Ægineta, there are records of its performance in the Veda of the Susruta and in the Talmud.

By the *Lex Regia*, attributed to Numa Pompilius (762—715 B.C.), it is forbidden to bury a pregnant woman before the child has been excised.¹

The Church did valuable service in countenancing and favouring the operation, and it is said that two of the Church's dignitaries were brought into the world by its means, viz., Burcard, Abbot of St. Gallen, sur-named "Ingenitus," in A.D. 959, and Gebhard, who was Bishop of Constance in 980.²

The Church being concerned with the saving of the souls as well as the lives of the children, in the Roman ritual dealing with the baptism of the child it is ordered "if a pregnant woman dies the child should be at once extracted cautiously and if alive it should be baptized."³

¹ "Negat lex regia mulierem quæ prægnans mortua sit humari antequam partus ei excidatur."

² Fasbender, *Gesch. der Geburtsh.*, 1906, p. 980.

³ See Fasbender *loc. cit.*, p. 980, and Cangiamila, quoted by Fasbender.

Whatever may have been the origin of the word *Cæsarean*, the operation seems to have been first called *Cæsarean Section* by the Jesuit Théophile Raynaud¹ in his work "de ortu infantium contra naturam, per *Sectionem Cæsaream*, tractatio," published in 1637 (see fig. 1).

Here I should like to put in a plea for the spelling "*Cæsarean Section*," which was the form adopted by its learned inventor nearly three hundred years ago. No doubt precedents can be found for the spelling *Cesarean* and even for *Cesarian*; but these should, I think, be replaced by the form originally adopted by Raynaud. In any case, there is no justification for the action of those American obstetricians, Drs. De Lee² and Newell,³ who not only write *Cesarean*, but derive the word from *cedo*, *cedere* instead of from *cædo*, *cædere*. It would not be more shocking to read that the word *centre*, which Americans spell *center*, came from a Latin word *centerum*.

"Non Cæsar super grammaticos."

It is convenient to divide the history of *Cæsarean Section* into three periods.

The First period—from the earliest times up to 1500. Up to this date the operation was done almost exclusively

¹ Théophile Raynaud was born at Sospello about the year 1583 and died at Lyons on October 31, 1663, at the age of 80. See "Biographie Universelle," which states that his work on *Cæsarean Section* was published in 1630; Fasbender says in 1647. They are probably both in error, for my copy is dated 1637, and the "approbatio" and the "permissio" bear this date.

² J. B. De Lee: "Principles and Practice of Obstetrics," ivth Ed., 1924, p. 1045.

³ F. S. Newell: "Cesarean Section," New York, 1921, p. 1.

DE ORTV
INFANTIVM
 CONTRA
 NATVRAM,
 PER SECTIONEM
Cæsaream,
 TRACTATIO:

*Qua reliqui item CONSCIENTIÆ NODI ad
 matrem alio gerentem, ac fatum, eiusque
 partum spectantes, solidè & accu-
 ratè expediuntur;*

A R. P. THEOPHILO RAYNAUDO,
 Societatis IESV Theologo.

*Accessit discussio erroris popularis, de Communione
 pro mortuis.*



LUGDVNI,
 Sumpt. GABR. BOISSAT, & Socior.

M. DC. XXXVII.

after the death of the mother. Israëls¹ states that the infant—the “Jotze Dofan” of the Talmud—was sometimes excised from the living mother. But the first detailed account we have of the operation on the living mother is given by Bauhinus² in his appendix to his translation of Francis Rousset’s “Hysterotomotokie”³ (1581), which was the first book published on Cæsarean Section. Bauhinus gives a very lively description of the operation performed about the year 1500 by the courageous sow-gelder, Jacob Nufer, of Sigershaufen, who, after thirteen midwives and several lithotomists had failed to deliver or relieve his wife, decided to operate with a razor “*non secus quam porco.*”⁴ The child lived to the age of 77. The mother recovered and later was delivered of twins, of whom one lived to the age of 73. After the twins four other children were born.

The Second period—from 1500 to 1876—comprises the years when the operation was attended with a very high rate of mortality and was therefore performed only in cases where no other mode of delivery was possible. The high mortality of the operation and its condemna-

¹ See Fasbender, *loc. cit.*

² Caspar Bauhinus in his appendix (Historia 1, p. 177) to Francis Rousset’s *ΥCΤΕΡΟΤΟΜΟΤΟΚΙΑ*, Bâle, 1588.

³ “Traité nouveau de l’Hysterotomotokie ou enfantement Cæsarien qui est extraction de l’enfant par incision lateral du vètre et matrice de la femme grosse, ne pouvant autrement accoucher. Et ce sans prejudicier à la vie de l’un ny de l’autre; ni empescher la fœcondité maternelle par après.” Paris, 1581.

⁴ Some writers have suggested that the operation was not a Cæsarean Section, but a laparotomy for ectopic gestation. I do not think this suggestion is justifiable, for it would be an unexampled occurrence for an ectopic child to be delivered after the mother “*doloribus partus per aliquot dies divexaretur,*” and for the child to survive for 77 years.

tion by many eminent obstetricians caused it to make very slow headway ; a remarkable instance of opposition was that of the "École anti-Cæsarienne" of Sacombe (1798), of which I have given an account elsewhere.¹

In England, the first operation from which the mother recovered was performed by Barlow, of Bolton, in 1793 ; the child did not survive. Statistics of the British operations from 1737 to 1860, collected by Professor E. W. Murphy,² of University College, show that the maternal mortality for the whole period was 84 per cent., but had fallen to 28·5 per cent. in the years 1840 to 1860. Späth³ states that up to the end of this period (1877) there had not been a single successful case of Cæsarean Section in the great Lying-in Hospital of Vienna.

The Third period—from 1876 to the present time. In the year 1876, Edoardo Porro introduced his operation of amputation of the uterus after Cæsarean Section, which reduced the total death-rate to 24·8 per cent. for the twenty-five years (1876-1901) and to 15·4 per cent. during the last ten years (Truzzi).⁴

At the same time the antiseptic system of surgery introduced by Lister in 1867 was reducing the death-rate of all operations.

The "Porro" operation in its original form, with extra-peritoneal treatment of the stump, had but a short

¹ "Presidential Address," Med. Soc. of Lond., October 8, 1923 ; *Lancet* and *Brit. Med. Journ.*, October 13, 1923.

² E. W. Murphy, "Principles and Practice of Midwifery," 2nd Ed., 1862, p. 714.

³ Späth, *Wien. Med. Wochenschr.*, 1878, p. 74.

⁴ Truzzi, "L'operazione Cesarea Porro," 1901, p. 233.

period of popularity and is now only indicated in cases of inoperable carcinoma of the cervix. In the rare cases in which the removal of the uterus is necessary, amputation with retroperitoneal treatment of the stump is still done by some operators; but total abdominal hysterectomy, first recommended in 1809 by Michaelis¹ to lessen the mortality of Cæsarean Section, is preferable.

It was more especially the writings of Saenger from 1882 onwards on the suture of the uterine incision, on which the success of the operation largely depends, which led to the general abandonment of mutilating operations in ordinary cases of contracted pelvis.

During the last few years there is a tendency in many clinics to substitute for the classical incision an incision in the lower segment and cervix, either without opening the peritoneum or through the peritoneum. As the present series contains no case of the kind, no more will be said here on the subject, which will be dealt with in a later chapter.

The safety of Cæsarean Section in non-infected cases has led to a great abuse of the operation, to which I have alluded more particularly elsewhere.² This abuse consists in its performance in unnecessary and unsuitable cases, and in its non-performance in cases for which it is suitable. This last neglect is one which is especially apt to escape notice when operators publish a series of specially selected cases without giving the *whole* of their cases.

It was a great merit of the work on Cæsarean Section,

¹ G. P. Michaelis, "Siebold's *Lucina*," 1809, Bd. V., p. 89.

² H. R. Spencer, Presidential Address, Med. Soc. Lond., October, 1923, and *Lancet* and *Brit. Med. Journ.*, October 13, 1923.

published by Dr. A. Routh,¹ that it was a complete record of all the cases by living British obstetricians, and though, through no fault of the author, many details are omitted, such as the presence and extent of adhesions, the time the patients and their children were under observation when they were described as "recovered" or "alive," it and Truzzi's work on the Porro-Cæsarean Section are the most valuable statistics we have at our disposal on Cæsarean Section.

It is in the hope that other obstetricians may publish the whole of their experience of the operation that I make this contribution. That the number of my cases is not larger is partly due to the fact that at University College Hospital for contracted pelvis we induce premature labour about three and a half times as often as we perform Cæsarean Section, as appears from the following figures, for which I am indebted to the Obstetric Registrar, Dr. Leslie Williams.

In the three years (1920, 1921, 1922) 5,647 women were delivered in the Maternity of University College Hospital. Of these:—

	Mortality to	
	Mother	Child
Premature labour was induced for contracted pelvis in 113	0	12
Cæsarean Section was performed for contracted pelvis.. .. ,, 32	0	2
Craniotomy was performed (twice for dead children, twice for hydrocephalus) ,, 4	0	4

Forceps were used for various indications 168 times (that is, in less than 3 per cent. of the cases).

¹ A. Routh, "Cæsarean Section in the United Kingdom," *Journ. of Obst. and Gyn. of the British Empire*, 1911, vol. xix, p. 1.

The following statistics are from the Rotunda Hospital, Dublin.¹

		Mortality to		
		Mother	Child	
Confinements 3,704—	Cæsarean Section	19	0	2
	Induction of labour	16	0	2
	Craniotomy ..	1	1	1
	Pubiotomy ..	1	0	0

The frequency of the performance of Cæsarean Section at University College Hospital was thus 5·5 per thousand labours. The frequency at the Rotunda Hospital, Dublin, was 19 in 3,704 labours, or 5·1 per thousand.

These figures are very different from Potter's² 88 per thousand labours, a frequency which involves many patients in unnecessary risk³ and is not calculated to bring about that advance of obstetrics which is the avowed intention of that author.

¹ "Rotunda Lying-in Report for 1923-1924," by Gibbon Fitzgibbon.

² I. W. Potter, "The Place of Version in Obstetrics," 1922, p. 131.

³ The risk of rupture of the scar in subsequent pregnancies is in Dr. Holland's statistics 4 per cent.; in addition there is a risk of hernia and intestinal obstruction arising from adhesions.

CHAPTER II.

ANALYSIS OF THE CASES.

THIS series comprises the whole of my cases of Cæsarean Section, the first having been performed on May 14, 1892, the last at my last attendance as a member of the active staff of University College Hospital on March 28, 1925. Ten of the cases were operated on in private nursing homes, and 110 at University College Hospital.

The total number of labours at the U.C.H. Maternity from which these cases were mainly derived was over 80,000 during my period on the staff (1887 to 1925).

The following figures show the number of cases each year from 1892 to 1925 (3 months): 1, 2, 2, 1, 0, 0, 0, 1, 1, 0, 0, 4, 3, 1, 1, 2, 3, 0, 1, 1, 2, 6, 2, 14, 3, 7, 5, 11, 11, 15, 8, 7, 5 (3 months of 1925), total = 120.

Parity.—Forty-seven of the patients were primiparæ; the others had had children or miscarriages.

Age.—There is nothing specially noteworthy under this heading except that there were thirteen patients over 40 years of age, of which four were affected with myoma, and two of these with contracted pelvis also.

Nine of the thirteen patients had contracted pelvis, one (No. 114) also placenta prævia.

Previous Labours.—At least forty-two of the seventy-three multiparæ had had dead children delivered, usually

by craniotomy or forceps, in previous labours; twenty-nine had been treated by Cæsarean Section.

Duration of Operation.—In all cases but one the duration of the operation is given, from the making of the abdominal incision till the dressing was applied.

The shortest duration was twenty-two minutes, a Porro-Cæsarean Section. Eight operations were completed within thirty minutes. Most of the operations took from thirty to forty-five minutes, while six lasted over an hour. Two of these took seventy-five and ninety minutes respectively; both being complicated with total abdominal hysterectomy for myoma.

The delivery of the child has been rapid, usually within half a minute to a minute from the commencement of the operation. The greater part of the time is consumed in suturing the uterus and abdominal wall.

INDICATIONS.

Of the 120 cases ninety-eight were for *contracted pelvis*: of these in four (Nos. 25, 26, 61, 114) labour had been induced; in one (No. 25) forceps had also been applied and placenta prævia was present. In five cases the pelvic bones and joints were diseased; in two the children were post-mature.

With regard to the size of the pelvis, the true conjugate was in one case $1\frac{1}{2}$ in.; in two cases (80, 103), 2 in.; in five cases $2\frac{1}{2}$ in.; in the majority of the remainder from $2\frac{3}{4}$ in. to $3\frac{1}{4}$ in.; in no case was the diagonal conjugate over $4\frac{1}{4}$ in. in patients operated on for contracted pelvis; but in a few cases, where the indication was the size of the child, or the failure of the natural efforts to deliver, or the desire for a living child

by women advanced in age, or the previous child had been born dead, the pelvis was only slightly contracted.

Two of the ninety-eight cases operated on for contracted pelvis died, both infected before the operation. The mortality rate for contracted pelvis was thus just over 2 per cent.¹

Myoma.—In nine cases the presence of myoma in the uterus was the indication for the operation. In two of these the tumours were infected, and in two cases (31 and 44) the pelvis was contracted.

One case was treated by Porro-Cæsarean Section.

Six² by Cæsarean Section and total abdominal hysterectomy.

One by Cæsarean Section and myomectomy.

One by simple Cæsarean Section (Case 49).

In Case 49 the tumour was infected with *bacillus welchii*, and the patient died of gas gangrene. The other cases recovered.

Pelvic enchondroma (Case 2).—In one case a large pelvic enchondroma reduced the conjugata vera to 1½ in., and had caused dilatation of the ureter, pyelitis, and nephritis. This patient died.

Vaginal and uterine cicatrices were the indications in three cases (6, 82, 86). The most interesting of these is Case 6, the patient remaining well twenty-five years after amputation of the cervix for carcinoma, and her son, born subsequently by Cæsarean Section, surviving to serve as a soldier in the Great War.

¹ If the two cases operated on for myoma which had also contracted pelvis were included, the mortality would be exactly 2 per cent.

² Five of the cases have been published in my "Tumours complicating Pregnancy, &c." Harrison and Sons, 1920; the sixth in *Brit. Med. Journ.*, ii, 1925, p. 647.

Ventrofixation by a previous myomectomy was the indication in one case (9).

Advanced cancer of the cervix in one case (10).

Ovarian (12, 95), or *parovarian tumour* (73), in three cases.

Accidental hæmorrhage occurred in four cases, one (29) being "concealed," and three (54, 75, 78) occurring in cases where the pelvis was contracted. In a fifth case (114) (labour induced for contracted pelvis) *placenta prævia* was present and caused severe hæmorrhage—all these cases of hæmorrhage were treated by conservative Cæsarean Section. The five mothers recovered; one child (which presented by the breech, in a case of severe accidental hæmorrhage and contracted pelvis) was dead.

CONDITION OF THE PATIENT AT THE TIME OF OPERATION.

It is difficult to give in abstract a statement as to whether the condition of the patient was favourable or not; the particulars are stated in the table.

At least twenty of the patients were in an unfavourable condition for operation, either because they had been long in labour with membranes ruptured, or had been examined outside the hospital, or were suffering from serious complications, or were already infected (five cases), or forceps had been applied (two cases).

Thirty-five cases were in labour, and in at least twelve of them the membranes were ruptured before the operation was undertaken.

Eighty-five cases were not in labour at the time of operation, which in these cases was performed when possible a few days before term.

The conditions most favourable for operation, in my opinion, are that the patient should not be in labour and should not have been examined vaginally before the operation; nevertheless many of the patients had been examined beforehand, and in six cases the labour had been induced. If carried out with proper antiseptic precautions I do not think that either previous examination or rupture of the membranes of a few hours' duration seriously affects the prognosis. Any violent or repeated manipulations are to be avoided, and generally it is inadvisable to perform the operation if forceps have been previously employed, and in all cases where there are clear signs of sepsis.

In the case of fibroids complicating pregnancy the tumours may be infected without giving clinical evidence of this condition (Case 49).

TECHNIQUE.

The uterine incision was a longitudinal one in the middle of the body of the uterus. The uterine incision in the conservative cases was sewn up in all cases with carbolized floss silk—deep interrupted sutures not involving the endometrium and a superficial continuous suture of the same material; in the earlier cases the superficial suture was a "Lembert" suture; in the later cases the superficial suture was passed parallel to the incision, as finally recommended by Saenger; the deep stitches are by this means completely buried, and I consider this to be the most important part of the operation, with the object of preventing adhesions. Details of the technique will be given later.

The abdominal wall was sewn up in layers with

through-and-through sutures of silkworm gut, continuous fine silk for the peritoneum, interrupted fine silk for the fascia, and interrupted silkworm gut for the skin. The deep sutures were tied over aseptic gauze. No drainage was employed.

In eleven cases the uterus was removed after the Cæsarean Section, on account of tumours, cancer, or uterine stenosis.

The four Porro-Cæsarean Sections were performed with Koeberle's serre-nœud. I employed it for the last time in 1903 for a case of inoperable cancer of the cervix complicating labour, and it is still in my opinion the best means of dealing with that condition.

In the *seven cases treated by total hysterectomy* the uterus was removed by Doyen's method, the peritoneum being closed by a silk purse-string suture, the vagina left open and the abdominal wound closed as in the conservative operations. All seven cases recovered.

In no case was the patient sterilized or the uterus removed on account of contracted pelvis.

ADHESIONS.

Adhesions were met with in twenty-four cases. In the repeated operations, twenty-nine in number, adhesions were found in thirteen cases, or about 44 per cent., but serious adhesions, i.e., of the uterus to the intestine or abdominal wall, in only the first three cases = about 10 per cent. Whereas in the first three cases, in which the peritoneum was sewn up with Lembert's sutures without taking care to bury the deep stitches, the adhesions were extensive—in the

third case so extensive that I was able to operate almost without opening the peritoneum—in the last twenty-six cases, when a more perfect peritoneal suture was used, there were adhesions in only ten of the cases, and these were of a slight nature (see table), viz., slight omental adhesions to the abdominal wall or uterus; but in no case was the uterus adherent to the abdominal wall or to the intestine.

Cases 35, 79, 97, 99, 106, 119, had slight filmy or thread-like adhesions to the bladder from the omentum or uterus. I think these were probably due to a little oozing from pricking a vein in sewing up the lower end of the incision, which in some cases extended nearly to the apex of the bladder; it is better, in my opinion, to keep the incision above the peritoneal reflection over the bladder; but in some cases it has extended towards the bladder during the extraction of the child.

The notes as to adhesions were in all cases made by myself immediately after the operation, and I have no trust in any figures obtained otherwise than by the operator, as slight adhesions easily escape the notice of clinical clerks. I hope that other obstetricians will keep careful notes of their cases of repeated Cæsarean Section with regard to this point, for the presence of serious adhesions forms one of the chief drawbacks to the operation. Most observers¹ are of opinion that serious adhesions are very common, and I think their comparative infrequency in this series may point to the advantage of the technique of the suturing employed.

¹L. Singer, "Des cicatrices césariennes abdominales classiques," 1909, says 65 per cent. of the cases have adhesions after the operation. In Bar's (*loc. cit.*) selected series more than half had adhesions.

REPEATED CÆSAREAN SECTION.

In twenty-nine patients—nearly one-fourth—the operation was repeated.

In eighteen patients the operation was performed for the second time.

In eight patients the operation was performed for the third time.

In two patients the operation was performed for the fourth time.

In one patient the operation was performed for the fifth time.

Some of the patients on whom the operation was performed for the third or fourth time were the same individuals who had had the operation performed twice, and the patient operated on for the fifth time also appears as operated on for the third and fourth time, the first two operations having been performed by another operator.

The comparative sterility of patients after Cæsarean Section is in my opinion mainly voluntary owing to the patients' desire to avoid another operation; the presence of serious adhesions is also a cause which, however, I think is largely avoidable.

The fertility of patients after Cæsarean Section may be illustrated by Case 119 who had three children in four and a half years, Case 59 who had four children in nine and a half years, Case 94 who had three children in six years, and Case 8 who had two children within a year and then did not have the third for nearly six years, probably owing to the presence of the severe adhesions present after the second operation; this patient's first two children died from diarrhœa and meningocele

respectively, the third survived, to the great joy of the mother and to the confounding of doctors who sterilize women on account of contracted pelvis.

MORTALITY.

It is important in all statistics of operations to state the number of days patients remain in hospital or nursing home after operation. In this series the patients were not discharged before the twenty-fourth day after operation.

Mortality to Mothers.—Four mothers (Cases 2, 36, 49, 116) died = 3·3 per cent.: one from nephritis, pyelitis and dilated ureters; one from gas gangrene; one from sepsis and one from shock and sepsis. All four cases were infected before the operation.

Mortality to Children.—Five children were delivered dead; three of these were dead before the operation, two were premature (labour induced). The immediate mortality = 4·1 per cent.

Seven other children died while in the hospital from the following causes: diarrhœa (fourteenth day), unexpectedly in sleep, meningocele, hæmorrhage from cord, cerebral hæmorrhage (mother toxæmic), forty-five hours after birth (cause unknown), convulsions.

The total infantile mortality was therefore 12 = 10 per cent. One of the children died from a preventable cause, viz., hæmorrhage due to a loose ligature carelessly tied on the cord by an assistant.

The deaths of the children occurred mainly in the early cases, and perhaps in Case 4 the death was not entirely unconnected with the anæsthetic (ether)

then given. In the last 100 cases only six children succumbed and ninety-four left the hospital at least twenty-four days after birth. In the majority of these 100 cases chloroform was administered until the child was delivered, which was usually from half a minute to one minute from the commencement of the operation.

THE PUERPERIUM—HEALING OF WOUND—HERNIA— SUTURES.

In twenty-eight patients out of the 116 who recovered (= over 24 per cent.) the temperature rose above 100° F. at some part of the puerperium; in spite of this the recovery was often uneventful. Although several of the cases were "unfavourable" at the time of operation and others suffered from bronchitis, aggravated in some cases by the anæsthetic, this series agrees with other in showing that a rise of temperature above 100° F. is common after Cæsarean Section.

The rise of temperature cannot, I think, be due to sepsis, inasmuch as the wounds heal without trouble. I believe every one of the cases of conservative Cæsarean Section healed up by first intention. Of the last sixty cases I have special notes that union by first intention took place in every case, excluding the fatal Case 116, and in no case was there discharge or stitch-abscess. It would be interesting to have records of the results of the use of antiseptic catgut in a similar series of cases, especially with regard to discharge from the wound, which must interfere with union. Union by first intention is of the first importance with a view to the prevention of hernia. In the most recent report on

Cæsarean Section¹ only seventy-six out of ninety-six cases of corporal section and half the cases of cervical and extraperitoneal section healed by first intention. See also Franz's results with catgut (Franz, *loc. cit. infra*, p. 51).

As far as I know only two² cases of hernia have developed in this series; but I have not examined every case. In none of the twenty-nine cases was a hernia present at the time of the repeated operation. In Case 8 the patient acquired syphilis and gonorrhœa a few months after the third operation, and an abscess occurred in the abdominal wall from which several uterine silk stitches were discharged and a sinus remained open for some months. This is the only case in my series of Cæsarean Sections in which I have known uterine stitches to be discharged or to give rise to a sinus in the abdominal wall.

¹ Klawns and Bodnar, *Archiv für Gynäk.*, 1925, Bd. 126, Hft. 1, p. 81.

² One of these was a conservative C. S., the other C. S. followed by total abdominal hysterectomy.

CHAPTER III.

CÆSAREAN SECTION IS PERFORMED TOO FREQUENTLY.

EVERY thoughtful obstetrician must admit that Cæsarean Section is being performed too frequently by certain operators both in this country and in America. Basing my opinion on my own experience at University College Hospital, extending over thirty-eight years, during which some 80,000 women have been delivered in the Maternity, and on the practice of such first-class hospitals as the Rotunda Hospital, Dublin, and Johns Hopkins Hospital, Baltimore, I do not think the staff of any hospital can be justified in performing 100 cases in a year, while the performance of 100 cases by an individual in one year is self-condemned when it is found that these 100 cases occurred amongst 1,130 cases of labour in which the operator also performed no less than 938 versions!¹ Excessive frequency of operating is due in part to the want of knowledge of the resources of Nature in cases of slight pelvic contraction and of the value of less severe methods (induction of premature labour and forceps) in dealing with them; and in part it is due to failure to consider that Cæsarean Section is not free from mortality, morbidity and after-effects, and that the results of operation in certain cases (such as

¹ I. W. Potter, *loc. cit.*

eclampsia, heart disease, hæmorrhages) are in many cases much inferior to those obtained by conservative methods, at least as regards the mother, who should be our first consideration. The inexperienced will be impressed by the publication of a selected series of cases such as those published by Bar,¹ who lost no mother or child amongst 97 conservative cases, and De Porenta² who had a similar result in 112 cases. But when the meagre and summarized reports are investigated it is found that the cases have been very carefully selected for operation, that cases where examinations have been made, the membranes ruptured a long time or induction or forceps applied, have been rejected as unsuitable for Cæsarean Section. A proper judgment as to the value of the statistics can only be formed when details of the cases and particulars of the number of craniotomies necessitated by this selection are published. The same criticism applies to Dr. S. Cameron's³ selected series of cases of "107 successive operations in rachitic subjects."

Although the performance of conservative Cæsarean Section in cases of real infection is certainly contra-indicated, yet the series of cases now published and the larger series of Franz⁴ show that such rigid selection as Bar carried out is not necessary, and it must lead to a number of destructive operations on the children. It

¹ P. Bar, *Archives mensuelles d'Obstétrique et de Gynécologie*, 1919, xi, p. 49.

² De Porenta, *Rivista d'Ostetricia e Ginecologia Pratica*, Oct., 1925, p. 425.

³ S. Cameron, *Proc. Roy. Soc. Med.*, 1923, xvi (Sect. Obst. and Gyn.), p. 50.

⁴ K. Franz, *Gynäkologische Operationen*, 1925.

would be interesting if the publishers of select series would give details of their cases, and would state the time the patients remained in hospital and the number of craniotomies performed during the period over which the operations extend, for comparison with the statistics of other obstetricians such as those given on pp. 12, 13.

A selected series of favourable cases in which details are not given is apt to deceive the inexperienced and to lead to too frequent operating; it is one of the "peccant humours" of learning, writes Bacon, to make statements "in a sort as may be soonest believed and not easiliest examined."

CHAPTER IV.

THE OPERATION.

THE PREPARATION OF THE PATIENT FOR OPERATION.

WITH regard to the time at which the operation should be performed, some operators prefer the patient to be in labour, and, in a hospital where the operating staff is resident, operating during labour has some advantages. Hæmorrhage is usually less and is more easily controlled when uterine action has started; the child is more mature and, the cervix having opened, there is better drainage than if labour has not begun. However, means for controlling the bleeding and for providing for drainage are available, and in view of the greater convenience to the patient and the operating and nursing staffs and the better preparation which operating before the onset of labour allows, I think the best time for the performance of the operation is (usually) before labour has set in, and to ensure this it is wise to fix the date for the operation at a few days before term. This permits operating at a suitable hour, which is preferably in the morning. An aperient (ordinarily *ol. ricini* ʒj) is usually given two days (sometimes one day) before the operation, light diet and an enema on the day before the operation. A vaginal douche of *liq. iodi.* (ʒj to Oj) and an enema are given on the morning of the operation and the bladder is emptied by catheter.

Overnight, after the patient has been washed and shaved and the whole of the abdomen cleaned with soap, ether and spirit, a compress soaked in a solution of carbolic acid (1 in 60) is applied and held in place by a many-tailed bandage all night. The compress is removed at the time of operation and the whole skin of the front of the abdomen and the vulva is swilled with 5 per cent. carbolic acid lotion, cotton wool being placed to prevent the solution running to the back. The lotion is then soaked up by sterile gauze so as to leave the abdominal wall dry. In operations of emergency, when this method of preparing the skin is not available, I have used tincture of iodine; but I do not like that method, owing to the irritation which it sometimes causes to the skin and the risk of the formation of adhesions if the iodine comes in contact with the intestines.

ANÆSTHESIA.

In all the cases except one a general anæsthetic has been given. The exception is Case 8, successfully delivered for the third time under local anæsthesia; but I have not employed that method since, as it does not produce complete anæsthesia during the suture of the abdominal wall and is less humane and more disturbing to the patient and operator than general anæsthesia.

I have not employed spinal anæsthesia, partly for the above reasons, but chiefly because it is more dangerous than general anæsthesia.

The early cases were anæsthetized by ether, either preceded by gas and administered by Clover's apparatus or by the "open" method.

The result of the employment of ether was that many

of the children were asphyxiated and required a good deal of attention—not always harmless—to revive them.

The following method which I have employed for the later cases is much to be preferred and I can recommend it highly.

The patient is placed on the operating table in the operating theatre, the arms and legs tied, the towels arranged and the abdomen prepared as mentioned above. The operator and assistants are also prepared, the needles threaded and the instruments and dressings ready before the anæsthetist begins to administer the anæsthetic.

Chloroform is administered until the anæsthetist states that the patient is ready. The operation is then performed rapidly and the child is delivered in half a minute to a minute (once in eighteen seconds) from the commencement of the incision. The anæsthetist then changes to "open" ether for the rest of the operation.

The child breathes and cries at once and the superiority of the method over that formerly employed is very marked.

I read a paper on this method of anæsthetizing patients for Cæsarean Section before the Section of Anæsthetics of the Royal Society of Medicine,¹ with the object of eliciting opinions from anæsthetists as to the advisability of giving chloroform until the child is delivered. The discussion was disappointing. The question really was, "Is chloroform dangerous when administered for a short time to pregnant and parturient women?" No decisive answer was given at the meeting, but I think it may be answered in the negative by the results of innumerable

¹ *Proc. Roy. Soc. Med.*, 1923, xvi (Sect. Anæsth.), p. 1.

cases in which it has been administered during ordinary labour. Moreover, the responsibility for administering it is the anæsthetist's, and I have never known an anæsthetist who declined to give it, or who, having given it, was not convinced of its advantages.

It was suggested by one speaker that perhaps, if the same precautions to shorten the time of administration had been taken and ether administered, the children might not have been asphyxiated by the ether. This can only be shown by trial; but the effect of ether on the fœtus has been shown experimentally to be injurious; chloroform has been similarly shown not only not to give rise to asphyxia in the fœtus *in utero*, but to be a valuable means of treating that condition when it has occurred.¹

I hope that obstetricians will give this method of anæsthetization a trial, viz., *chloroform till the child is delivered, "open" ether afterwards.*

I may add that I much prefer ether as an anæsthetic in ordinary gynæcological cases, and am quite aware of the danger to the mother of chloroform administered in quantity over prolonged periods. And, notwithstanding this, in a few cases where acute bronchitis was present, chloroform has been used throughout the operation with good results.

THE INCISION.

The incision of the abdominal wall should be made with caution owing to the thinness of the wall in advanced pregnancy. It has been made in the course of its history in various positions and directions, and the

¹ See G. Frey, *Zentralb. f. Gyn.*, 1924, No. 18, and Wilkomm, *ibid.*, 1925, p. 1830.

DE DISSECT. PARTIVM



FIG. 2.—Oblique incision on left side for post-mortem Cæsarean section (C. Stephanus, 1548).

uterine incision has been made in the body and cervix and in the front, back, fundus and sides. C. Stephanus (1548), who published one of the first printed illustrations of the operation, marked the uterine incision obliquely on the left side (see fig. 2).¹ Scipione Mercurio (1595) advised the abdominal incision to be made on the right side (to avoid the spleen! See fig. 3), and Guy de Chauliac² recommended the left side (to avoid the liver!). I think it is best made in the middle line, or through the inner edge of the right rectus muscle. The umbilicus may be avoided or excised if the wall is very thin. Of late I have not hesitated to make it through the umbilicus, finding that with the method of suture adopted very good results are obtained. The abdominal incision, about 5 in. in length, should be so planned that the incision into the uterus is made in the thick part of the body and does not reach down to the reflection of the peritoneum over the bladder.

Before the peritoneum is opened it should be picked up with toothed forceps and a small opening made in it; the rest of the peritoneum should then be opened by slipping the forceps into the small opening and cutting between the blades or between two fingers introduced into the abdomen. The wound is then opened to examine the uterus and ascertain the position of the round ligaments. If, as usually happens, the uterus is tilted and turned to the right, an assistant with his fist

¹ A still earlier woodcut appears in the "Seelwurzgarten," printed by Conrad Dinckmuth in 1483. It represents the birth of Antichrist through a large Cæsarean incision, the midwife lifting out the child by her hands placed in its axillæ. The woodcut is reproduced in *Aesculape*, No. 4, 1924, p. 96.

² Guy de Chauliac, "Chirurgia magna," Tract VI, 1585.

applied to the patient's right loin presses the uterus to the middle line. The uterus is then opened in the



FIG. 3.—Vertical incision on right side (Scipione Mercurio, 1595).

middle line through the thick part of the body. When the decidua is seen it is opened at the upper end of the wound and two fingers are inserted and the wound

enlarged with the knife to the full length of 4 in. It is not absolutely necessary to insert the fingers if the membranes are intact; but if the waters have burst, either a flat spatula or the fingers should be inserted to protect the child. For want of this precaution two of the children were slightly scratched with the knife, and one was cut on the shoulder deeply enough to require a suture.

The child is then rapidly delivered either by a foot or by the head, the cord clamped by two pairs of large forceps and cut between them and the child handed to an assistant who ties the cord. This little operation requires to be carefully done. I have known another child, besides the child in Case 9, lose its life from hæmorrhage owing to a badly applied ligature. The ligature should be of boiled floss silk or thread dehydrated in alcohol. The placenta and membranes are then delivered, the uterus being withdrawn from the abdomen for this purpose, and the abdominal wound is closed around it either by the pressure of the assistant's hands or by a volsella or a temporary suture of silkworm gut. In none of the conservative cases has the uterus been withdrawn from the abdomen before making the incision; to do so necessitates a long incision and, with the precautions mentioned, it is quite unnecessary. The duty of the assistant is to keep the abdomen closed around the uterus, and rolls of gauze should be packed on each side to sop up any overflow.

The placenta and membranes are then removed. Often the membranes tear owing to their adhesions to the lower segment. When they begin to tear they are seized below the tear and pulled on with strong forceps, and

then again with another pair of forceps below the first. In this way the whole of the membranes can usually be removed easily. The finger is then passed through the uterine incision to feel that the cervical canal is open. If it is closed by a small piece of adherent membrane, this is easily perforated by a pair of uterine forceps introduced from below through the cervix and withdrawn (opened), after the abdominal wound is closed.

The uterine wound is then sutured. The sutures are of floss silk, moderately thick for the deep suture and very fine for the peritoneal suture. The silk sutures are prepared by boiling for three hours in 1 in 20 carbolic acid solution, they are then placed in 1 in 500 perchloride of mercury solution for twelve hours, then kept for a fortnight in 1 in 20 carbolic acid solution, and during the operation lie in a dish of 1 in 40 carbolic acid solution, in which the previously boiled instruments also are immersed.

For the passage of the sutures small curved needles threaded at each end of the silk are used for the deep sutures; and fine straight, round, embroidery needles for the peritoneal suture which buries the deep sutures; fine, half-curved Hagedorn's needles for the abdominal peritoneum, sheath of rectus and skin, and long straight needles threaded at each end of silkworm gut for the through-and-through stitches, which are tied over gauze.

All sutures are threaded before the operation.

The deep sutures are passed at intervals of about half an inch, from within outwards, missing the decidua. The uppermost and the lowermost are first tied and used

by the second assistant to hold the uterus, which is returned into the abdomen, up against the abdominal wall. The others are all inserted before being tied, and as soon as they are inserted the needles are cut off and thrown into a basin covered with a towel, which is near the operator. Before closing the abdominal wound the gauze rolls are counted, the space above the bladder is inspected and any clot removed; the region above the uterus is also examined and warm sterilized normal solution is poured into the abdomen, which is then closed in the way already mentioned and the sterilized gauze and cellulose dressing is applied.

The suturing of the uterine wound is so important that a few more details may be given of the method recommended. After the deep sutures have been tied they are cut off short at the knots. These knots are then buried by the apposition of the peritoneal surfaces by means of the fine silk suture used as follows: just below the lowest knot of the deep sutures a fine round straight embroidery needle, threaded with fine silk, is passed through the edges of the peritoneum and the thread tied, the end beyond the knot being cut short; then the needle is passed downwards parallel to the left side of the lower end of the wound, then across below the wound, then upwards parallel to the right side, and so alternately on the two sides parallel to the incision and outside the deep threads, taking up peritoneum and muscle. The needle is pulled through by the assistant with Spencer Wells forceps and the thread drawn tight, thereby apposing the peritoneum and covering the knots. At the upper end of the incision the suture is either tied to itself, one end cut off and the needle

end sewn into the tissues, and the thread cut short so that the end retracts into the tissues, or a second needle and thread may be used at the upper as described for the lower end, and it may be tied to the lower suture and both needles used to sew the ends into the tissues. The result is that no silk is exposed and only a wavy line is visible where the peritoneum is apposed, and no blood escapes on squeezing the uterus. It is to Saenger that we are mainly indebted for the improvement in the suture of the uterus, and the method described is essentially the suture finally recommended by Saenger¹ modified in some slight details.

The abdominal incision is sewn up in the following way: The through-and-through stitches of silkworm gut are passed from within outwards through all the layers, including the edge of the peritoneum; a very fine continuous silk suture is then passed in the peritoneum so as to exclude the silkworm gut sutures from the abdomen; this suture is passed either across or parallel to the edges of the peritoneum. Interrupted sutures of fine silk are applied at short intervals to the edges of the sheath of the rectus so as to appose them, but not to constrict the tissues. Fine interrupted silkworm gut sutures are applied at short intervals in the skin and, if the wall is fat, a few semi-deep sutures of silk-worm gut are used. In a few cases the wall is so thin that it is not practicable to suture the peritoneum and sheath separately. In these cases the continuous peritoneal stitch is carried also through the sheath and tied at intervals.

Finally, the through-and-through stitches are tied over

¹ Saenger, *Centralbl. für Gyn.*, 1890, p. 215.

strips of gauze, and the dressing of aseptic gauze and cellulose is applied and held by a many-tailed bandage of soft flannel. No drainage is employed. I have tried other methods of stitching, including Michel's clips, the endermic stitch, continuous suture for sheath and skin, but consider them inferior to the method described.

Very little need be said on the subject of catgut sutures, the use of which I abandoned more than thirty years ago. Dr. Holland has shown that their use is followed by rupture of the scar two and a half times as frequently as when silk is employed. Catgut is unreliable in regard to its sterility, is apt to come undone as a result of the uterine contractions, the ends of the knots cannot be cut short with safety, and it is liable to be infected with pathogenic microbes, including those of tetanus.

Silk also has its disadvantages in that it takes a long time to get absorbed and may cause prolonged suppuration if it becomes infected.

The fact that I have met with only one case of uterine sinus from infected stitches and no case of rupture of the scar is in favour of the use of silk sutures if prepared and used as directed. Silkworm gut is an excellent suture for skin surfaces; but I do not think it is a good suture to bury in the uterus, and I do not know whether it is ever absorbed.

The adverse criticism of the silk suture has been mainly due to the faulty methods of the critics in preparing and using it, which have prevented its harmlessness from becoming, in the words of Saenger,¹ "incorporated in the flesh and blood of surgeons."

¹ Saenger, "Nahtmaterial," *Archiv für Gyn.*, vol. xxvi, 1885, p. 216.

HÆMORRHAGE DURING THE OPERATION.

If excessive bleeding occurs during the operation the uterus is kneaded and flushed with hot salt solution; occasionally it is thought advisable to give an ampoule (0.5 c.c.) of "pituitrin." This causes the uterus to contract, but interferes with the suturing, making it difficult to appose the surfaces of the peritoneum; it is therefore better—and with rare exceptions it is possible—to avoid the use of "pituitrin" in cases of Cæsarean Section.

THE EXTRAPERITONEAL AND TRANSPERITONEAL
CERVICAL INCISION.

Since 1907, when Frank proposed the incision of the lower segment and cervix of the uterus, many obstetricians have performed the operation either by an extraperitoneal or transperitoneal incision, of which there have been many modifications. It is thought by some authorities that the scar in that situation will prove less liable to rupture, that adhesions are less frequent, that it has the advantage that the operation can be best performed after a trial of the effects of the natural forces, and that it is available in cases of infection which are unsuitable for the classical operation. As I have never performed the operation by incising the lower segment, I will state shortly my reasons for not adopting it.

With regard to the scar being less liable to rupture in subsequent pregnancies and labour, it is to be observed that several cases of rupture have already been recorded.¹

¹ Dr. Holland (Eden and Holland's "Manual of Midwifery," 1925, p. 661), in stating that no case has yet been reported of rupture of a scar in the lower segment, has overlooked the four cases published by Martius and others. See Martius, *Archiv für Gyn.*, Bd. 117, 1922, p. 106.

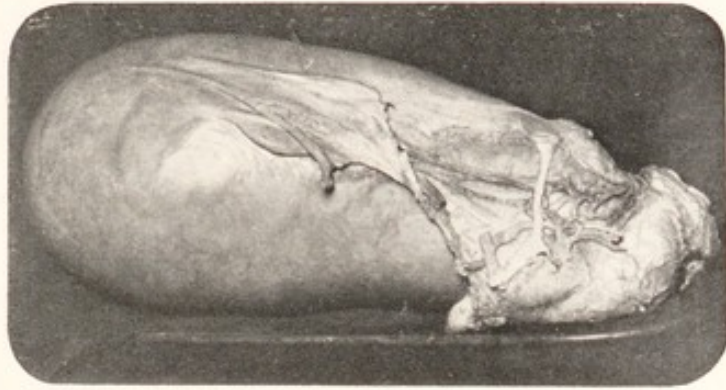


FIG. 4.—Uterus at term with bladder and rectum before the onset of labour, showing the position of the vessels and ureter: author's specimen (photograph).



FIG. 5.—Uterus at term (left half), showing the thinness of the anterior lower segment and the small space available behind the bladder for delivery of the child through an extraperitoneal incision: author's specimen (photograph).



With regard to adhesions, I may refer to what I have already written on the subject, recalling that serious adhesions after the classical operation are not met with if the uterine suture be properly carried out. The classical operation permits repeated operations without difficulty; although repeated operations have also occurred after the subperitoneal incisions, difficulties have been met with on account of adhesions in the cellular tissue, and I know of no case where the operation has been repeated many times.

With regard to a trial of natural labour, there is no reason why this should interfere with the prognosis of the classical operation, if due antiseptic precautions have been taken. As to the use of the extraperitoneal incision in infected cases, there is no reason to suppose that it is safer than the classical operation, while it introduces certain dangers, such as injury to the bladder or ureter¹ or to veins, leading to thrombosis. In real cases of infection Cæsarean Section should either not be performed or should be supplemented by total abdominal hysterectomy. There is no doubt that the incision in the lower segment introduces dangers which are absent from the classical operation, some of which may be seen in figs. 4, 5.

One of the chief objections is the time it takes before the child is born. Whereas by the classical operation the child can be delivered in half a minute, it took an accomplished operator half an hour to deliver

¹ O. Küstner, *Zentralbl. für Gyn.*, 1922, p. 882, amongst 200 extraperitoneal Cæsarean Sections had two ureteral fistulas and "several" vesico-vaginal and vesico-cervical fistulas; in addition he had a number of cases in which the bladder was torn and stitched without fistula resulting.

a child by the subperitoneal operation, and the same operator had to abandon the operation for the classical one on account of hæmorrhage. Many of the cases require drainage and do not heal by first intention. For all these reasons I do not think it is likely that the operation—which is a favourite one with many obstetricians, and has totally displaced the classical operation in the practice of some—will long maintain that position. But this can only be settled by a complete and detailed record of cases, for which I appeal.

REMOVAL OF THE UTERUS AFTER CÆSAREAN SECTION.

It may be necessary or advisable to remove the uterus after Cæsarean Section for cancer, tumour, sepsis or uncontrollable hæmorrhage. For *cancer*, if operable, Wertheim's extended abdominal hysterectomy should be performed; if inoperable, Porro's operation. For *myoma*, the whole uterus should be removed, preferably by Doyen's method. The hand should be passed into the uterus through the incision, the forefinger of the left hand hooked into the cervix¹ and used to pull up the organ. An incision is then made on to the edge of the cervix in Douglas's pouch, opening the vagina; the cervix is then circumcised and pulled up and the uterus excised with scissors, cutting towards the uterus from below upwards. Spurting vessels are seized and tied with fine silk, oozing at the base of the broad ligaments is controlled by ligation over small curved Wertheim's forceps applied below dissecting forceps which pick up

¹ This may also be done through a stab wound in the posterior wall of the lower segment.

the bleeding surface. The peritoneum and ligaments are sewn up with a purse-string silk suture; the vagina is left open for drainage. In very vascular cases a strip of iodoform gauze is applied to the raw surface by the vagina and is removed after two days.

For *ovarian tumour* it is rarely necessary to perform Cæsarean Section; the removal of the tumour alone is usually preferable. In cases of incarcerated ovarian fibroids or cysts when adherent and for *parovarian* cysts, I believe Cæsarean Section and ovariectomy is safer than the simple removal of the tumour.¹ Unless both ovaries are extensively diseased the uterus should not be removed.

For *septic cases* the whole uterus should be removed and the vagina left open for drainage, as described for myoma.

Uncontrollable hæmorrhage rarely calls for removal of the uterus; rapid operating and the use of pituitrin and kneading the uterus being sufficient to check the bleeding.

STERILIZING THE PATIENT AFTER CÆSAREAN SECTION.

The removal of the uterus which is required in some of the conditions just mentioned has been used by some operators in simple cases of pelvic contraction as a means of sterilizing the patient, and other measures have been adopted with the same object.

I have never sterilized a patient on account of contracted pelvis and regard sterilization for such a condition as an unjustifiable procedure. The duty of the

¹ See H. R. Spencer, "Tumours complicating Pregnancy, &c.," Harrison and Sons, 1920; and *Brit. Med. Journ.*, i, 1925, p. 500.

obstetrician is to restore the patient as nearly as possible to her previous condition, and that is done by conservative Cæsarean Section and not by the mutilating operation of hysterectomy, nor by ligaturing, excising or burying the Fallopian tubes.

In Dr. A. Routh's collected statistics of Cæsarean Section, published in 1910, no less than 350 women had been sterilized by British obstetricians on account of contracted pelvis. I have spoken on many occasions against the practice, which I cannot condemn too strongly, for it is justifiable neither by midwifery nor by morals. It is pleasant to find that some obstetricians have given up the practice, and the writer of one of the most valuable textbooks on midwifery says that he is now "up to date" in this matter and no longer sterilizes the patient. It is to be hoped that other obstetricians will follow his example.

CHAPTER V.

CÆSAREAN SECTION FOR OTHER CAUSES
THAN DYSTOCIA.

OF late years there has been a great increase in the number of Cæsarean Sections performed, not on account of difficulty of delivery by the natural passages, but on account of diseases or accidents or advanced age in the mother or of malpresentations of the child. I propose to consider the chief of these, which, in my opinion, are much too frequently treated by this operation.

ECLAMPSIA.

Dr. Holland's collected statistics¹ show that no less than 196 cases of eclampsia were treated by Cæsarean Section in British hospitals in the course of ten years, the mortality of the mothers being 32 per cent.² and that of the children 50 per cent.

Professor Stroganoff's mortality for the mothers treated by conservative method was only 6 per cent., and although other authorities have not been able to obtain such good results, even when employing

¹ E. Holland, *Journ. of Obs. and Gyn. of the British Empire*, vol. xxviii, 1921.

² Dr. Holland shows that of twelve cases which recovered five became pregnant, and of these two ruptured the Cæsarean scar. These fatalities added to the immediate deaths give a mortality rate of 48 per cent. See Spencer, *Proc. Roy. Soc. Med.*, 1921, xiv (Sect. of Obst. and Gyn.), p. 141.

Stroganoff's measures—which suggests that his cases were of an exceptionally mild character—the mortality of Cæsarean Section is so much higher than the natural mortality that, in my opinion, the operation ought not to be performed, and, personally, I have never performed it for this condition.

It is to be remembered that eclampsia is rarely repeated in the same patient, and that after natural delivery she may have no further trouble in subsequent labours. On the other hand, if Cæsarean Section is performed, it will generally be advisable to repeat it in the subsequent labours.

It is to be noted also that Cæsarean Section has been performed mainly for early cases, with the patient in comparatively good condition, and it is just in these cases that medical treatment finds its most successful application. In view of the high mortality of the mothers I think it must be very rarely indeed that Cæsarean Section can be justified for eclampsia.

ANTEPARTUM HÆMORRHAGES.

Cæsarean Section has been performed of late years with increasing frequency for placenta prævia and accidental hæmorrhage.

For *placenta prævia* I think the indications for its performance are rarely met with. Besides the case in this series (in which it occurred as a complication of contracted pelvis) I have met with two cases in which I regretted that the operation had not been done:—

(1) A case of complete placenta prævia in which the child was alive, although an alarming hæmorrhage had occurred for the first time at term, and the os was undilated.

(2) A case of twin pregnancy with placenta prævia and hydramnios, in which the presence of hydramnios with the second twin rendered bimanual version difficult and prolonged, and a laceration of the cervix occurred during the version.

Both these patients succumbed to shock and hæmorrhage, and might have been saved by operation.

For the great bulk of the cases of placenta prævia treatment by version, Champetier de Ribes's bag, and in certain cases rupture of the membranes and forceps will be found to be more advantageous for the mothers, although the mortality to the children is high.

It is to be remembered that the child is usually premature, and therefore less likely than a full-term child to survive, and that a repetition of placenta prævia in subsequent pregnancies is unusual, whereas if Cæsarean Section has been performed it may be necessary to repeat the operation in subsequent labours.

For *accidental hæmorrhage* Cæsarean Section is rarely required. But it may be necessary in some cases of concealed hæmorrhage, in which rupture of the membranes and vaginal packing are ineffective, or in which bleeding has occurred into the uterine wall, broad ligament or peritoneum. In cases in which bleeding has occurred into the uterine muscle (as in Case 29), it is not necessary on that account to remove the uterus.¹

In considering the advisability of Cæsarean Section in cases of antepartum hæmorrhage, it is well to bear in mind the rate of mortality which attended the treatment

¹ Holland, *loc. cit.*, gives the mortality of Cæsarean Section in cases of accidental hæmorrhage as 11 per cent., and of Cæsarean Section followed by hysterectomy as 46·6 per cent.

before the operation was suggested by Lawson Tait, who had little experience of midwifery. I collected many years ago records of cases of placenta prævia attended in the Maternity of University College Hospital, with a maternal mortality of 6 per cent., and in cases of accidental hæmorrhage I can only recall the deaths of two or three cases out of a very large number seen. Cæsarean Section, although it is done on selected cases, has a much higher mortality, in addition to the risk of rupture of the scar in subsequent pregnancies. I think, therefore, it is only in very exceptional cases that operation is required.

Advanced Age of the Mother.—Many patients of 38 or 40 years of age deliver their children as easily as younger women, though the labour may be prolonged. Given a normal pelvis and presentation, I see no reason for resorting to the operation; but elderly women are liable to have myoma in the uterus, and if the presentation is “breech” or “transverse” these complications may be an indication in the elderly primipara, unless version can be performed.

There are two conditions for which it has been performed on many occasions, viz., transverse presentation where the child is dead and cannot be turned or decapitated, and incarceration of the child by “hour-glass contraction.” I do not think the operation, which has a high mortality rate, can be necessary for either of these conditions. The former may be successfully dealt with by spondylotomy and Braxton Hicks’s cephalotribe,¹ the latter by embryotomy, opiates and weight extension.

¹ H. R. Spencer, “On Delivery in certain Cases of Impaction of the Trunk of the Fœtus,” *Brit. Med. Journ.*, April 13, 1895, i, p. 308.

HEART DISEASE.

Uncompensated heart disease is attended by considerable risk in cases of labour; compensated heart disease often gives rise to no difficulty or danger.

The treatment should be medical and conservative. In many cases under this treatment premature labour comes on naturally and the labour proceeds without incident; in others premature labour may be induced by bougies and rupture of the membranes and be terminated by forceps; in cases of cyanosis bleeding is sometimes useful.

I do not think that Cæsarean Section is advisable, even under local or spinal anæsthesia; not only is there a liability to mental shock, but sometimes Cæsarean Section is followed, even in simple cases, by alarming tachycardia, to which attention has been called by Bar and of which I have seen several examples. In normal cases this tachycardia is evanescent, but I think its occurrence in a severe case of heart disease might easily turn the scale against the patient.

Holland's¹ collected statistics show in forty cases of Cæsarean Section in cardiac disease a maternal mortality of 22·5 per cent., and a foetal mortality of 27·5 per cent., figures which greatly exceed the mortality of natural delivery.²

¹ E. Holland, *loc. cit.*, p. 379.

² *Vide* Couvelaire, *Bull. de la Soc. Belge de Gyn. et d'Obst.*, 1925, p. 40.

CHAPTER VI.

CONCLUSION.

A TABLE is appended giving details of the 120 cases, with the results to the mother and child, up to the twenty-fourth day after operation. In the foregoing chapters I have given an analysis of the cases with details of the technique of the operation. I have also given my reasons for not performing certain operations such as the extra-peritoneal Cæsarean Section, sterilization of the patients on account of contracted pelvis, and treating eclampsia and pregnancy complicated with heart disease by this operation.

I have endeavoured to show that Cæsarean Section is being performed too frequently by some obstetricians, and in support of this opinion have given statistics for comparison.

Cæsarean Section has attained such a state of perfection that in suitable cases it may be said to be almost free from risk to the mother and to have but a slight risk to the child. There are, however, certain after-effects of the operation which involve some danger, viz., rupture of the scar, adhesions and their consequences (pain and intestinal obstruction), and hernia. I believe these after-effects are largely avoidable by the use of proper sutures and suturing. Notwithstanding the drawbacks attending its use, I consider silk the most suitable material for suture in Cæsarean Section. The

frequency of the occurrence of hernia can only be ascertained by an extended inquiry; but some light may be thrown on this and other after-effects by careful notes of the mode of healing of the wound in all cases, and the condition of the scar and the presence and extent of adhesions in repeated operations. In none of the twenty-nine cases of repeated Cæsarean Section was there a hernia of the abdominal scar. In the last sixty cases of Cæsarean Section investigated union took place by first intention without discharge in every case. It is for the advocates of the use of catgut to state the percentage of cases in which such union takes place when that suture is used. Franz¹ has shown that in his 300 cases sewn up with catgut interference with primary union occurred in 27·7 per cent., viz., stitch-hole abscess or discharge from the wound in 15 per cent. and abscess of the abdominal wall in 12·7 per cent.

With a view to the prevention of infection before the operation, which is the chief danger, care of the patient during pregnancy and antiseptic precautions with the use of gloves in making internal examinations are most important.

No patient should be allowed to advance beyond the thirty-fifth week of pregnancy without an examination of the pelvis and its relation to the child; and no patient with a serious degree of pelvic contraction should have forceps or version applied without the advice of an expert obstetrician.

In a case of contracted pelvis, measuring not more than $3\frac{1}{4}$ in. in the true conjugate and pregnancy advanced beyond the thirty-fifth week, every obstetrician nowadays

¹ K. Franz: "Gynäkologische Operationen," 1925, p. 265.

would advise Cæsarean Section in preference to the alternative operations, induction of labour, forceps, symphysiotomy or pubiotomy. The last two operations have not been considered in this book, as I have never performed them, and in the opinion of most obstetricians they have been superseded by the advances of Cæsarean Section. Amongst those advances many obstetricians enumerate the extraperitoneal or transperitoneal lower segment and cervix incision. I do not consider that incision so good as the classical operation, and am glad to find that the most recent and remarkable statistics of Franz support me in that opinion.

This little book has no pretence to be a treatise on Cæsarean Section, but is a record as frank as I can make it of my own experience of the operation. I hope that its conclusions will meet with acceptance, and that those who are unable to support the views I have expressed may be led to furnish further particulars bearing upon the points raised in this contribution. A complete and detailed record will enable me, and others, to learn from their experience. I am not without hope that they may be able to learn something from mine.

I conclude my personal record as Montaigne began his :—

“ C'est ici un livre de bonne foy.”

TABLE OF 120 CASES OF CÆSAREAN
SECTION.

*For much help in the preparation of this Table I am indebted
to my friend Mr. J. B. Hunter.*

Case No.	Date	Initials	Age	No. and details of previous labours	Dur. of operation in mins.	Indication
1	May 14, 1892 ..	A. D. ..	28	Primipara	51	Myoma of cervix and lower segment
2	April 16, 1893..	H. G. ..	21	Primipara	32	Pelvic enchondroma ; dilated ureter, C.V. 1½ in.
3	August 2, 1893	F. W. ..	21	Primipara	48	Contracted pelvis, C.V. 2½ in.
4	May 20, 1894 ..	A. C. ..	27	2 children, both delivered by craniotomy	61	Contracted pelvis, C.V. 2¾ in.
5	July 28, 1894 ..	F. W. ..	21	1 child (C.S.) ..	30	Contracted pelvis, C.V. 2½ in.
6	March 6, 1895	E. W. ..	34	6 children, 1 abor...	22	Cicatrix after high amputation for cancer of cervix (April 8, 1893)
7	August 17, 1899	A. C. ..	32	2 children (craniotomy), 1 C.S.	44	Contracted pelvis, C.V. 2¾ in.
8	April 3, 1900 ..	F. W. ..	27	2 children (both C.S.)	25	Contracted pelvis, C.V. 2½ in.
9	Jan. 13, 1903 ..	F. F. ..	30	Primipara	41	Ventro-fixation from myomectomy with extraperitoneal stump
10	March 20, 1903	C. C. ..	34	11 children	30	Advanced cancer of cervix
11	June 16, 1903..	H. P. ..	36	3 children—(1) cephalotripsy, (2) induced D., (3) induced D.	40	Toxæmia ; contracted pelvis, C.V. 4¼ in.

CÆSAREAN SECTION.

Condition of patient at time of operation, especially as regards labour	Technique	Adhesions	Result		Repeated C.S. and private cases	Remarks on puerperium
			Mother	Child		
In labour 12 hours, membranes ruptured 10 hours	Porro-Cæsarean	No	R.	R.	..	Child 6 lb., grew up to 5 ft. 10 in. ; married 1919. <i>Obstet. Soc. Trans.</i> , vol. xxxviii
Unfavourable ; in labour 16 hours ; albumin ; examined by midwife	" "	"	D.	R.	..	Died 9th day ; chronic nephritis, pyelitis, dilated ureters. <i>Obstet. Soc. Trans.</i> , vol. xxxviii
Favourable ; in labour, membranes intact	C.S. silk (deep interrupted, superficial continuous). Patient not sterilized	"	R.	L.	..	Child died 14th day (diarrhœa)
Favourable ; not in labour	" "	"	R.	L.	..	Simple recovery. Child died unexpectedly in its sleep (no p. m.)
" "	" "	To omentum and cæcum	R.	L.	Repeated, 2nd C.S. (No. 3)	Child died 12th day (meningocele)
" "	Porro-Cæsarean	No	R.	R.	..	Mother well 25 years after amputation ; child a soldier in Great War, 1914-18. <i>Ob. Soc. Trans.</i> , vol. xxxviii, and "Tumours complicating Pregnancy," &c., 1920
" "	C.S. silk (deep interrupted, superficial continuous). Patient not sterilized	Of uterus to abdl. wall	R.	R.	Repeated, 2nd C.S. (No. 4)	Uneventful recovery
" "	" "	Of uterus to abdl. wall, peritoneal cavity only opened at upper part	R.	R.	Repeated, 3rd C.S. (Nos. 3 and 5)	First case performed for third time. First two children died. Uneventful recovery
" "	" "	Of fundus and loop of intestine to abdl. wall	R.	L.	..	Child died from hæmorrhage from loosely ligated cord ; mother's recovery simple. T. normal after 5th day
Unfavourable ; in labour 8 hours	Porro-Cæsarean	No	R.	R.	..	T. 100° (except 2nd day 101°) for fortnight after labour ; recovered ; died of the cancer 7 months later
Unfavourable ; toxæmic, in labour	C.S. silk (deep interrupted, superficial continuous). Patient not sterilized	"	R.	L.	..	Child died 7 hours (cerebral hæmorrhage). Mother's T. 101·8° on 8th and 9th days, uneventful after

Case No.	Date	Initials	Age	No. and details of previous labours	Dur. of operation in mins.	Indication
12	Nov. 28, 1903..	G. ..	38	Primipara	60	Calcified ovarian fibroid incarcerated in pelvis
13	March 19, 1905	B. ..	28	Primipara	75	Fibroid of uterus, footling presentation
14	October 17, 1905	E. H. ..	33	2 children (craniotomy for both)	38	Contracted pelvis, C.V. 2 $\frac{3}{4}$ in.
15	Nov. 3, 1905 ..	B. S. ..	37	Primipara	46	Contracted pelvis, C.V. 3 in.
16	May 11, 1906 ..	B. ..	33	Primipara	57	General and obliquely contracted pelvis; old tubercular hip disease; head above brim
17	March 1, 1907..	C. ..	34	Primipara	58	General contracted pelvis, old tubercle of sacrum, fibroid left lower segment
18	March 29, 1908	M. A. N.	38	Primipara	60	Fibroid adherent in Douglas, retroflexion of uterus
19	June 12, 1908..	A. M. ..	34	1 (12 years ago, cephalotripsy)	42	Contracted pelvis, C.V. 3 in.
20	May 22, 1909 ..	E. H. ..	37	3 (2 craniotomy, 1 C.S.)	27	Contracted pelvis, C.V. 2 $\frac{3}{4}$ in.
21	July 15, 1909 ..	E. R. ..	37	1 child (forceps to head after many hours) born alive; mother nearly died	55	Myoma uteri, persistent pain; bad obstetric history
22	Oct. 9, 1909 ..	K. S. ..	34	2 children, both born dead at 39th and 37th week	40	Contracted pelvis, C.V. 2 $\frac{1}{2}$ -2 $\frac{3}{4}$ in.

Condition of patient at time of operation, especially as regards labour	Technique	Adhesions	Result		Repeated C.S. and private cases	Remarks on puerperium
			Mother	Child		
Favourable; not in labour	C.S. Silk (deep interrupted, superficial continuous). Patient not sterilized	No	R.	R.	Private case	Simple recovery. Had a premature labour 1904
Unfavourable; ascites, albuminuria; in labour, membranes ruptured, emergency operation	C.S. and total abdominal hysterectomy	A few around R. (ruptured ectopic) tube	R.	R.	Private case	Ascitic fluid evacuated in second week, then simple recovery
Not in labour ..	C.S. silk (deep interrupted, superficial continuous). Patient not sterilized	No	R.	R.	..	Uneventful recovery; highest T. 99.6° 3rd day, normal on 10th
Favourable; in labour 8¾ hours; membranes ruptured	.. ..	..	R.	R.	Private case	Uneventful recovery
Favourable; in labour 8½ hours; membranes ruptured	.. ..	..	R.	R.	Private case	Uneventful recovery
In labour, membranes ruptured, emergency operation at 3 a.m.	.. .. small fibroid anterior wall removed, the larger not removed	..	R.	R.	Private case	Uneventful recovery
Unfavourable; in labour 3 days, membranes ruptured, 32 hours, child dead; dirty discharge from uterus	C.S. and total abdominal hysterectomy	Of fibroid to Douglas	R.	D. (before operation)	..	Uneventful recovery; highest T. 100.2° on 8th day. In <i>Proc. Roy. Soc. Med.</i> , vol. ii, O. and G. Sec., p. 74. L. ovarian sarcoma removed in 1919. Large recurrent growth treated by X-rays; stationary, 1923
Favourable; not in labour	C.S. silk (deep interrupted, superficial, continuous). Patient not sterilized	No	R.	R.	..	Uneventful recovery; highest T. 100° first day
.. ..	.. ..	..	R.	R.	Repeated, 2nd C.S. (No. 14)	Uneventful recovery
Favourable; not in labour, at 38½ weeks	C.S. and total abdominal hysterectomy (posterior wall incised)	..	R.	R.	..	<i>Proc. Roy. Soc. Med.</i> , 1910, vol. iii, p. 82
Favourable; not in labour, membranes intact	C.S. silk (deep interrupted, superficial continuous). Patient not sterilized	..	R.	R.	..	Uneventful recovery

Case No.	Date	Initials	Age	No. and details of previous labours	Dur. of operation in mins.	Indication
23	July 20, 1911 ..	K. S. ..	36	3 children (2 still-born, 1 C.S.)	46	Contracted pelvis, C.D. 3 $\frac{1}{4}$ in.
24	March 15, 1912	C. B. ..	36	1 child (craniotomy)	39	Contracted pelvis, C.D. 3 $\frac{1}{2}$ in.
25	July 14, 1913 ..	A. M. ..	24	Primipara	45	Contracted pelvis, C.D. 4 $\frac{1}{4}$ in.
26	July 15, 1913 ..	R. C. ..	25	2 children	45	Contracted pelvis, C.D. 3 $\frac{3}{4}$ in.
27	March 4, 1914	C. C. ..	30	Primipara	45	Kyphotic pelvis, trans. diam. of outlet, 2 $\frac{1}{2}$ in.
28	Feb. 27, 1914 ..	E. N. ..	39	1 child (9 lb., destroyed)	39	Contracted pelvis, C.D. 4 $\frac{1}{4}$ in.
29	April 30, 1914..	A. M. ..	28	1 child, 1 abor. ..	61	Concealed accidental hæmorrhage
30	May 28, 1914 ..	R. F. ..	32	2 children (both destroyed)	36	Contracted pelvis, C.D. 3 $\frac{3}{4}$ in.
31	Oct. 12, 1914 ..	C. ..	40	Primipara	90	Myoma uteri, contracted pelvis, C.V. 3 $\frac{1}{2}$ in.
32	Oct. 29, 1914 ..	A. L. ..	33	1 child, destroyed ..	60	Contracted pelvis, C.D. 4 in.
33	Feb. 18, 1915 ..	E. D. ..	24	Primipara	40	Contracted pelvis, C.D. 4 in.
34	March 12, 1915	A. C. ..	34	Primipara .. ..	..	Contracted pelvis, C.D. 4 in.
35	Jan. 8, 1916 ..	B. A. ..	31	2 children (both C.S.)	43	Contracted pelvis, C.D. 3 $\frac{1}{4}$ in.
36	Jan. 18, 1916 ..	R. M. ..	22	Primipara	33	Contracted pelvis, C.V., 3 $\frac{3}{8}$ in.
37	Jan. 31, 1916 ..	D. G. ..	33	Primipara	50	Contracted pelvis; 3 days in labour, head above brim, contracted outlet

CÆSAREAN SECTION (contd.).

Condition of patient at time of operation, especially as regards labour	Technique	Adhesions	Result		Repeated C.S. and private cases	Remarks on puerperium
			Mother	Child		
Favourable; not in labour	C.S. silk (deep interrupted, superficial continuous). Patient not sterilized	No	R.	R.	Repeated, 2nd C.S. (No. 22)	T. 100° for 4 days; uneventful recovery
Not in labour ..	" "	"	R.	R.	..	T. 100° after operation, normal after 5 days
In labour (induced) forceps applied	" "	A few flimsy in front of uterus	R.	R.	..	T. 101° 4 days before operation, remained high till 10th day; offensive discharge during puerperium; exudate left iliac fossa and pouch of Douglas, which gradually dispersed
In labour (induced)	" "	No	R.	R.	..	Slight T. for a few days; involution delayed
Not in labour ..	" "	"	R.	R.	..	Uneventful recovery, T. normal after 6 days
" " ..	" "	"	R.	R.	..	Uneventful recovery; T. normal on 4th day
Not in labour; history of injury, attacks of abdl. pain with increasing frequency of pulse and pallor; os rigid, admitted finger	" "	"	R.	R.	..	Pulse after operation 140, fell to 120; T. rose slowly to 103.6° on 8th day and fell to normal in 3 days
Not in labour ..	" "	"	R.	R.	..	Uneventful recovery
Membranes ruptured, in labour, emergency operation at 4 a.m.	C.S. and total abdominal hysterectomy	"	R.	R.	Private case	Uneventful recovery
In labour 3 hours	C.S. silk (deep interrupted, superficial continuous). Patient not sterilized	"	R.	R.	..	4th day temperature rose to 102°, normal on 7th day
Not in labour ..	" "	"	R.	R.	..	T. 102.4° on 4th day, normal on 9th day
In labour 4 hours	" "	"	R.	R.	..	T. about 100° for 9 days; otherwise uneventful
Not in labour ..	" "	Sheet adhesion of uterus to bladder	R.	R.	Repeated, 3rd C.S.	Uneventful recovery
In labour (induced) 12 hours. T. 101°, P. 130. Patient very exhausted	" "	No	D.	D.	..	Patient died on 7th day of septicæmia
In labour 3 days, but membranes not ruptured	" "	"	R.	R.	..	Uneventful; highest T. 99°

Case No.	Date	Initials	Age	No. and details of previous labours	Dur. of operation in mins.	Indication
38	March 11, 1916	D. W. ..	24	Primipara	37	Contracted pelvis, C.D. 3½ in.
39	April 12, 1916..	A. D. ..	35	7 children : (1) craniotomy, (2) forceps L., (3) forceps D., (4) induction, (5) forceps D., (6) forceps D., (7) stillborn	60	Contracted pelvis, C.D. 4¼ in.
40	April 22, 1916..	K. S. ..	41	4 children : 2 craniotomy, 2 C.S. L.	45	Contracted pelvis, C.D. 3¼ in.
41	June 6, 1916 ..	E. S. ..	30	Primipara	40	Contracted pelvis, C.D. 3 in.
42	July 1, 1916 ..	W. B. ..	41	2 children, both stillborn	37	Contracted pelvis, C.D. 3¾ in.
43	July 6, 1916 ..	F. T. ..	23	Primipara	49	Contracted pelvis, C.D. 4¼ in.
44	Sept. 20, 1916..	M. E. ..	42	Primipara	54	Myoma and contracted pelvis, C.D. 4¼ in.
45	Oct. 14, 1916 ..	A. B. ..	32	Primipara	38	Contracted pelvis, C.D. 4¼ in.
46	Oct. 16, 1916 ..	J. H. ..	39	(1) forceps, (2) craniotomy, (3) induced	35	Contracted pelvis, C.D. 4¼ in.
47	Nov. 11, 1916..	E. C. ..	27	1 child, craniotomy	45	Contracted pelvis, C.D. 3¾ in.
48	Nov. 30, 1916..	F. L. ..	38	Primipara	50	Dwarf pelvis, C.D. 3 in.
49	March 1, 1917..	A. S. ..	42	1 abortion (febrile)	52	Myoma uteri
50	March 17, 1917	E. B. ..	25	Primipara	40	Contracted pelvis, C.D. 4 in.

CESAREAN SECTION (contd.).

Condition of patient at time of operation, especially as regards labour	Technique	Adhesions	Result		Repeated C.S. and private cases	Remarks on puerperium
			Mother	Child		
Not in labour ..	C.S. silk (deep interrupted, superficial continuous). Patient not sterilized	No	R.	R.	..	Uneventful recovery
In labour 2 hours	" "	"	R.	R.	..	T. 101° 2nd day, slowly fell to normal
Not in labour ..	" "	Tag of omentum adherent to abdl. wall, uterus free	R.	R.	Repeated, 3rd C.S. (Nos. 22, 23)	T. 100° for 10 days, afterwards normal
Patient very anæmic; not in labour	" "	No	R.	R.	..	T. 101° on 4th day, slowly fell to normal
Not in labour ..	" "	No, but lymph over back of fundus	R.	R.	..	T. 101° on 2nd day, slowly fell to normal
" " ..	" "	No	R.	R.	..	T. 101° on 4th day; un-interrupted recovery
" " ..	C.S. and total abdominal hysterectomy	"	R.	R.	..	T. 100° till 12th day, then rose to 103° (due to gauze swab removed); abscess upper part of wound; recovery then rapid. Patient and child well 5 years later
" " ..	C.S. silk (deep interrupted, superficial continuous). Patient not sterilized	"	R.	R.	...	T. 100° for 3 days, then normal
In labour (induced) membranes ruptured 48 hours, hand presented	" "	"	R.	D.	..	T. 100·8° second day; uneventful recovery
Not in labour	" "	"	R.	R.	..	T. 100·6° second day, normal on 4th day; uneventful recovery
" " ..	" "	"	R.	R.	..	Highest T. 100·6°, pulse 96, normal 14th day
Not in labour; condition apparently good but tumours infected with <i>Bacillus welchii</i>	" "	"	D.	R.	..	Patient died of sepsis (gas gangrene). Published with illust., Lettsomian Lectures "Tumours complicating Pregnancy, &c.," 1920
Not in labour ..	" "	"	R.	R.	..	Uneventful recovery

Case No.	Date	Initials	Age	No. and details of previous labours	Dur. of operation in mins.	Indication
51	August 25, 1917	D. W. ..	30	1 child	45	Contracted pelvis, C.D. 2½ in.
52	Feb. 8, 1918 ..	M. ..	40	1 child, D. after 2 applications of forceps	60	Contracted pelvis, C.D. 3½ in.
53	Feb. 9, 1918 ..	N. H. ..	32	2 children (6 lb. and 7 lb.); both had pond fractures	33	Contracted pelvis, C.D. 3¾ in.
54	June 25, 1918..	A. S. ..	44	(1) craniotomy, (2) stillborn	24	Contracted pelvis, C.D. 3¾ in.
55	Aug. 8, 1918 ..	E. F. ..	26	(1) induced, D.; (2) induced, D.	35	Contracted pelvis, C.D. 4¼ in.
56	Aug. 10, 1918 ..	A. L. ..	37	(1) embryotomy, (2) C.S.	36	Contracted pelvis, C.D. 4 in.
57	Sept. 22, 1918..	A. M. ..	29	(1) D. (forceps), (2) D. (forceps)	43	Contracted pelvis, C.D. 4 in.
58	Dec. 14, 1918 ..	B. A. ..	34	(1) C.S., (2) C.S., (3) C.S.	36	Contracted pelvis, C.D. 3½ in.
59	March 29, 1919	K. S. ..	44	(1) craniotomy, (2) craniotomy, (3) C.S., (4) C.S., (5) C.S.	38	Contracted pelvis, C.D. 3½ in.
60	Oct. 17, 1919 ..	M. P. ..	30	Primipara	40	Contracted pelvis, C.D. 3¾ in.
61	Oct. 26, 1919 ..	A. D. ..	38	(1) craniotomy, (2) forceps (L.), (3) D., pond fracture; (4) induced, (5) D., pond fracture; (6) D., (7) D. (forceps), (8) C.S.	31	Contracted pelvis, C.D. 4¼ in.
62	Sept. 13, 1919..	H. H. ..	20	Primipara	34	Contracted pelvis, C.D. 4 in.
63	Sept. 13, 1919..	E. M. ..	20	Primipara	36	Contracted pelvis, C.D. 4 in.
64	Jan. 17, 1920 ..	E. D. ..	29	1 C.S.	40	Contracted pelvis, C.D. 4 in.
65	March 6, 1920..	C. M. ..	31	Primipara	27	Contracted pelvis, C.D. 4¼ in.

CÆSAREAN SECTION (contd.).

Condition of patient at time of operation, especially as regards labour	Technique	Adhesions	Result		Repeated C.S. and private cases	Remarks on puerperium
			Mother	Child		
In labour 4 hours, induced by outside doctor	C.S. silk (deep interrupted), superficial continuous). Patient not sterilized	No	R.	R.	..	Very collapsed after operation, recovered rapidly, then uneventful convalescence
Not in labour ..	" "	"	R.	R.	Private case	Uneventful recovery
" " ..	" "	"	R.	R.	..	T. 101.2° on 2nd day, normal on 4th day
Two attacks accidental hæmorrhage; patient almost pulseless before operation	" "	"	R.	R.	..	T. 99.8° on 2nd day; pulse had quieted down to 98 and patient steadily recovered
Good, not in labour	" "	"	R.	R.	..	Uneventful recovery
Not in labour ..	" "	One flimsy on surface of uterus; small omental tag to pubes	R.	R.	Repeated, 2nd C.S.	T. rose to 101.4° 3rd day, normal on 4th day
In labour 6 hours	" "	No	R.	R.	..	T. 102° on 2nd day, normal 3rd day; uneventful recovery
Not in labour ..	" "	"	R.	R.	Repeated, 4th C.S. (Nos. —, —, 35)	Uneventful recovery
" " ..	" "	Slight omental to R. of upper wound, uterus free	R.	R.	Repeated, 4th C.S. (Nos. 22, 23, 40)	T. of 99° for 10 days; simple recovery
" " ..	" "	No	R.	R.	..	T. 99.6° for 14 days
" " ..	" "	"	R.	R.	Repeated, 2nd C.S. (No. 39)	Uneventful recovery
" " ..	" "	"	R.	R.	..	Uneventful recovery
" " ..	" "	"	R.	R.	..	Uneventful recovery
Not in labour, hydramnios	" "	"	R.	R.	Repeated, 2nd C.S. (No. 33)	T. 100.4° 4th day, normal 7th day
Not in labour; large myoma removed 14 months previously	" "	"	R.	R.	..	Uneventful recovery

Case No.	Date	Initials	Age	No. and details of previous labours	Dur. of operation in mins.	Indication
66	April 28, 1920 ..	L. A. ..	39	(1) embryotomy, (2) induced, (3) induced, D., (4) C.S., (5) C.S.	35	Contracted pelvis, C.D. 4 in.
67	June 5, 1920 ..	A. B. ..	27	(1) forceps, D, (2) stillborn	36	Contracted pelvis, C.D. 4 in.
68	June 5, 1920 ..	E. S. ..	38	Primipara	32	Kyphotic pelvis, transverse of outlet $2\frac{5}{8}$ in.
69	June 26, 1920 ..	R. K. ..	18	Primipara	38	Contracted pelvis, C.D. $3\frac{3}{4}$ in.
70	July 31, 1920 ..	E. A. ..	24	Primipara	28	Contracted scoliotic pelvis, ext. conj. 6 in.; height 45 in.
71	August 4, 1920	H. B. ..	25	Primipara	38	Contracted pelvis, C.D. $3\frac{3}{4}$ in.
72	August 5, 1920	E. McM.	26	(1) C.S., (2) forceps, L.	50	Contracted pelvis, C.D. $3\frac{3}{4}$ in.
73	August 20, 1920	M. ..	27	Primipara	65	Parovarian cyst incarcerated in pelvis (normal)
74	August 19, 1920	A. M. ..	22	Primipara	32	Contracted pelvis, C.D. $3\frac{3}{4}$ in.
75	Jan. 3, 1921 ..	H. H. ..	34	3 children (dead); no abor.	45	Contracted pelvis, C.D. $3\frac{7}{8}$ in.
76	Jan. 15, 1921 ..	F. C. ..	30	(1) forceps, L., (2) forceps, L., (3) forceps, L., (4) induced, D., (5) induced, D.	45	Contracted pelvis, C.D. $3\frac{3}{4}$ in.
77	Feb. 21, 1921 ..	M. ..	41	Primipara	50	Myoma uteri
78	May 7, 1921 ..	A. H. ..	22	Primipara	58	Contracted pelvis, C.D. $3\frac{3}{4}$ in.
79	May 21, 1921 ..	H. H. ..	28	(1) at 6 months, (2) C.S.	30	Contracted pelvis, C.D. $4\frac{1}{8}$ in.
80	June 7, 1921 ..	E. H. ..	26	Primipara	40	Dwarf, C.V. 2 in.
81	June 11, 1921..	S. F. ..	30	Primipara	47	Contracted pelvis, C.D. $3\frac{3}{4}$ in.

CÆSAREAN SECTION (contd.).

Condition of patient at time of operation, especially as regards labour	Technique	Adhesions	Result		Repeated C.S. and private cases	Remarks on puerperium
			Mother	Child		
Not in labour ..	C.S. silk (deep interrupted, superficial continuous). Patient not sterilized	No	R.	R.	Repeated, 3rd C.S.	Rigor 3rd day, T. 102°, P. 122, normal 7th day
" " "	" "	Few flimsy from recent inflammation	R.	R.	..	Uneventful recovery
" " "	" "	No	R.	R.	..	Uneventful recovery
" " "	" "	"	R.	R.	..	Uneventful recovery
" " "	" "	"	R.	R.	..	T. 101° 3rd and 4th days
In labour, membranes ruptured; examined by outside doctor	" "	"	R.	R.	..	Uneventful recovery
In labour 7 hours, membranes ruptured 4 hours; emergency operation	" "	Of omentum to uterus and abdl. wall	R.	R.	Repeated, 2nd C.S.	T. rose to 103° on 19th day, normal on 23rd day.
Not in labour ..	" "	A few flimsy shreds on fundus	R.	R.	Private case	Good recovery; but had R. femoral thrombosis in 3rd week. Recovered completely; mother and child well 3 years later.
Not in labour; purulent discharge (? gonorrhœa)	" "	No.	R.	R.	..	Uneventful recovery
In labour; severe accidental hæmorrhage; breech	" "	"	R.	D.	..	Uneventful recovery
Not in labour	" "	"	R.	R.	..	Uneventful recovery
Good, not in labour	" " (myomectomy also performed)	A few around R. tube	R.	R.	Private case	Uneventful recovery
Good, not in labour; hæmorrhage before operation	C.S. silk (deep interrupted, superficial continuous). Patient not sterilized	No.	R.	R.	..	T. 103·4° second day (bronchitis), afterwards normal
Not in labour, child lying obliquely	" "	Slight, of omentum to apex of bladder	R.	R.	Repeated, 2nd C.S. (No. 62)	Uneventful recovery
Not in labour ..	" "	No.	R.	R.	..	Uneventful recovery
" " "	" "	"	R.	R.	..	Uneventful recovery

Case No.	Date	Initials	Age	No. and details of previous labours	Dur. of operation in mins.	Indication
82	July 23, 1921 ..	R. N. ..	35	5 children	49	Extensive colpoperineorrhaphy and amputation of cervix
83	Oct. 8, 1921 ..	R. K. ..	19	1 (C.S.)	35	Contracted pelvis, C.D. 3 $\frac{3}{4}$ in.
84	Nov. 5, 1921 ..	A. B. ..	28	(1) forceps, D., (2) stillborn, (3) C.S.	55	Contracted pelvis, C.D. 4 in.
85	Nov. 12, 1921 ..	G. C. ..	32	(1) Craniotomy, (2) C.S.	34	Contracted pelvis, C.D. 3 $\frac{3}{4}$ in.
86	Jan. 7, 1922 ..	A. P. ..	38	1 child, D.	46	Scarred vagina and cervix; small pelvis
87	Jan. 19, 1922 ..	C. P. ..	29	Primipara	51	Contracted pelvis, C.D. 4 $\frac{1}{4}$ in., ankylosed hip
88	March 4, 1922	A. M. ..	34	(1) born D., forceps, (2) born D., forceps, (3) C.S.	44	Contracted pelvis, C.D. 4 in.
89	March 19, 1922	— D. ..	43	Primipara (married 11 years)	35	Contracted pelvis, C.V. 3 $\frac{1}{2}$ in.; head above brim
90	March 25, 1922	E. A. ..	26	1 C.S.	51	Contracted pelvis, ext. conj. 6 in., scoliosis
91	April 29, 1922	A. C. ..	36	Primipara	37	Contracted pelvis, C.D. 3 $\frac{3}{4}$ in.
92	May 6, 1922 ..	G. M. ..	39	Primipara	35	Contracted pelvis, bilateral dislocation of hips, ext. conj. 6 $\frac{3}{4}$ in.
93	May 13, 1922 ..	F. C. ..	32	? 7 (1 D., 1 C.S.) ..	34	Contracted pelvis, C.D. 3 $\frac{3}{4}$ in.
94	May 13, 1922 ..	B. A. ..	37	(1) C.S., (2) C.S., (3) C.S., (4) C.S.	41	Contracted pelvis, C.D. 3 $\frac{1}{4}$ in.
95	May 20, 1922 ..	N. A. ..	18	Primipara	58	Ovarian dermoid impacted in pelvis, could not be replaced
96	June 7, 1922 ..	C. L. ..	39	7 children : 2 at term (both D.), 1 with broken arm, 5 induced, 2 only survived	54	Contracted pelvis, C.D. 3 $\frac{3}{4}$ in.
97	July 15, 1922 ..	H. B. ..	27	1 C.S.	35	Contracted pelvis, C.D. 3 $\frac{3}{4}$ in.
98	Dec. 15, 1922 ..	I. B. ..	31	Primipara (2 abortions)	52	Contracted pelvis (slight); child post-mature (9 lb. 2 oz.); head above brim; parents Roman Catholics

CÆSAREAN SECTION (contd.).

Condition of patient at time of operation, especially as regards labour	Technique	Adhesions	Result		Repeated C.S. and private cases	Remarks on puerperium
			Mother	Child		
Not good; purulent discharge; not in labour	C.S. and total abdominal hysterectomy	No	R.	L.	..	T. rose to 103.4° on 6th day, then slowly fell to normal; child died 45 hours after birth
Not in labour ..	C.S. silk (deep interrupted, superficial continuous). Patient not sterilized	..	R.	R.	Repeated, 2nd C.S. (No. 69)	T. 101.2° first 24 hours, afterwards uneventful recovery
..	R.	R.	Repeated, 2nd C.S. (No. 67)	Uneventful recovery
..	R.	R.	Repeated, 2nd C.S. (No. 47)	Uneventful recovery
..	R.	R.	..	Uneventful recovery
In labour 24 hours; bronchitis and purulent otitis at time of operation	R.	R.	..	T. 102° to 102.4° on 6th and 9th days, normal after 15th day
Good; not in labour	R.	R.	Repeated, 2nd C.S. (No. 57)	Normal recovery; highest T. in hospital 99.4°
Not in labour	R.	R.	Private case	Uneventful recovery
..	R.	R.	Repeated, 2nd C.S. (No. 70)	Uneventful recovery
..	R.	R.	..	Uneventful recovery
..	R.	R.	..	Uneventful recovery
..	R.	R.	Repeated, 2nd C.S.	Uneventful recovery
..	R.	R.	Repeated, 5th C.S. (Nos. —, —, 35, 58)	Uneventful recovery
..	No (tag of omentum to R. of upper incision)	R.	R.	..	Uneventful recovery
In labour some hours and examined; membranes not ruptured	No	R.	R.	..	Uneventful recovery
Not in labour	None to uterus, slight filmy over bladder	R.	L.	Repeated, 2nd C.S. (No. 71)	Sickness for 4 days; recovered well; child died of convulsions on second day
..	No	R.	R.	..	Uneventful recovery

Case No.	Date	Initials	Age	No. and details of previous labours	Dur. of operation in mins.	Indication
99	Dec. 16, 1922 ..	R. K. ..	21	(1) C.S., (2) C.S. ..	47	Contracted pelvis, C.V. 3 in.
100	March 1, 1922	G. S. ..	43	1 induced, D. ..	47	Contracted pelvis, C.D. 4 $\frac{1}{4}$ in.
101	June 2, 1923 ..	D. F. ..	27	1 abortion, 11th week	42	Contracted pelvis, C.D. 4 $\frac{1}{8}$ in.
102	June 9, 1923 ..	A. M. ..	25	1 C.S.	35	Contracted pelvis, C.V. 3 in.
103	June 22, 1923 ..	E. D. ..	26	Primipara	39	Contracted pelvis, C.V. 2 in.
104	July 27, 1923 ..	G. M. ..	33	1 child, 6 lb., delivered with difficulty by forceps	46	Contracted pelvis, C.V. 3 $\frac{3}{4}$ in. Child post-mature, 8 lb. 3 oz., head above brim
105	Oct. 27, 1923 ..	M. W. ..	23	1 child, 7 lb. 5 oz., D., difficult forceps	38	Contracted pelvis (generally), ext. conj. 7 in.
106	Nov. 29, 1923..	H. B. ..	28	(1) C.S., (2) C.S. ..	35	Contracted pelvis, C.D. 3 $\frac{3}{8}$ in.
107	Dec. 12, 1923 ..	F. P. ..	34	2 born dead ..	31	Contracted pelvis, C.V. 3 in.
108	Dec. 29, 1923 ..	E. B. ..	24	1 child, 5 lb., delivered with difficulty	41	Contracted pelvis, C.D. 4 $\frac{1}{4}$ in. ; left hip disease
109	Jan. 19, 1924 ..	E. L. ..	30	Primipara	42	Contracted pelvis, C.V. 3 in. ; ankylosed hip and knee
110	March 22, 1924	S. F. ..	33	1 C.S.	40	Contracted pelvis, C.D. 3 $\frac{3}{4}$ in.
111	June 14, 1924 ..	M. S. ..	28	Primipara	52	Myoma of lower uterine segment, infected

CÆSAREAN SECTION (*contd.*).

Condition of patient at time of operation, especially as regards labour	Technique	Adhesions	Result		Repeated C.S. and private cases	Remarks on puerperium
			Mother	Child		
Not in labour; good condition	C.S. silk (deep interrupted, superficial continuous). Patient not sterilized	None of uterus; slight filmy above bladder; one strand to fundus	R.	R.	Repeated, 3rd C.S. (Nos. 69, 83)	Uneventful recovery
In labour, membranes not ruptured	" "	No	R.	R.	..	Uneventful recovery
Not in labour ..	" "	"	R.	R.	..	Uneventful recovery
" " ..	" "	"	R.	R.	Repeated, 2nd C.S.	Uneventful recovery
In labour, membranes not ruptured; 2 small fibroids anterior wall	" "	"	R.	R.	..	Uneventful recovery
Not in labour ..	" "	"	R.	R.	..	Uneventful recovery
Not in labour; vaginal discharge	" "	Slight of omentum to L. tube	R.	R.	..	T. 101.5° on second day, gradually fell to normal
Chronic bronchitis; in labour, membranes ruptured	" "	One slight membrane from bladder to lower uterine scar	R.	R.	Repeated, 3rd C.S.	Uneventful recovery
In labour, emergency operation at midnight	" "	No	R.	R.	..	Uneventful recovery
In labour, membranes not ruptured. Sloughing ulcer on left leg	" "	"	R.	R.	..	Uneventful recovery
Not in labour ..	" "	"	R.	R.	..	Uneventful recovery
Not in labour (bronchitis)	" "	One thread-like along uterus; none of uterus to wall or intestine	R.	R.	Repeated, 2nd C.S. (No. 81)	Uneventful recovery
Not in labour ..	C.S. and total abdominal hysterectomy	No	R.	R.	..	Uneventful recovery

Case No.	Date	Initials	Age	No. and details of previous labours	Dur. of operation in mins.	Indication
112	July 12, 1924 ..	H. H. ..	31	(1) C.S., (2) C.S. ..	43	Contracted pelvis, C.D. 4½ in.
113	August 9, 1924	G. ..	29	No children, 2 abor.	50	Contracted pelvis, C.D. 4¼ in.; hip disease
114	Oct. 8, 1924 ..	M. H. ..	44	10 children, 2 abor., 2 craniotomy, 5 forceps (2 D.), 3 induced, L.	37	Contracted pelvis, C.D. 4¼ in.; placenta prævia
115	Oct. 11, 1924 ..	C. P. ..	25	2 children, no abor., induced, both D.	37	Contracted pelvis, C.D. 4¼ in.
116	Jan. 4, 1925 ..	M. P. ..	36	Primipara	62	Contracted pelvis, C.V. 3½ in.
117	Jan. 12, 1925 ..	T. ..	42	1 child (born D.) ..	46	Generally contracted pelvis
118	Jan. 25, 1925 ..	A. P. ..	38	8 children (4 by forceps, 1 craniotomy)	36	Contracted pelvis, C.D. 4¼ in.
119	Feb. 14, 1925 ..	A. M. ..	27	2 children (both C.S.) no abor.	34	Contracted pelvis, C.V. 3 in.
120	March 28, 1925	L. T. ..	21	1 child (D.) forceps, paraplegia followed lasting 3 months	39	Contracted pelvis, C.D. 3¾ in.

CÆSAREAN SECTION (contd.)

Condition of patient at time of operation, especially as regards labour	Technique	Adhesions	Result		Repeated C.S. and private cases	Remarks on puerperium
			Mother	Child		
Not in labour ..	C.S. silk (deep interrupted, superficial continuous). Patient not sterilized	Of omentum to R. of abdl. scar and 1 tag to upper end of uterine scar	R.	R.	Repeated, 3rd C.S.	Uneventful recovery for fortnight. Fever 103° in 3rd week (? pyelitis), rapidly subsided
Good; not in labour	„ „	No.	R.	R.	..	T. 101° 4th day, gradually fell to normal
In labour (induced) 2 days; severe hæmorrhage from placenta prævia	„ „	„	R.	R.	..	T. 102·8° 5th day, rapidly fell to normal
Good; not in labour	„ „	„	R.	R.	..	Uninterrupted recovery
Very bad; in labour 2 days, membranes ruptured; os 1 in. in diam.; forceps applied by outside doctor; cervix torn; severe shock; P. 140; child D.; albumin in urine in large quantity	„ „	„	D.	D.	..	Died within 2 hours. R. hydronephrosis found post mortem, fatty liver and focal necroses, hæmorrhage into the broad ligament, laceration of cervix and vagina
Not good; diarrhœa; P. 100 to 110	„ „	„	R.	R.	Private case	Uninterrupted recovery
Good; in labour all day; os size of halfpenny, head above brim	„ „	„	R.	R.	..	Uninterrupted recovery, highest T. 99·8° 2nd day
Good; not in labour	„ „	String-like, of omentum to edge of wound and apex of bladder, uterus free	R.	R.	Repeated, 3rd C.S. (Nos. 74 and 102)	Uninterrupted recovery, highest T. 99·2° 2nd day
Good; not in labour (bronchitis)	„ „	No.	R.	R.	..	Uninterrupted recovery, highest T. 101·8° 2nd day (bronchitis)



